Charles University in Prague

Faculty of Social Sciences
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MASTER THESIS

The effect of material prosperity on happiness: Evidence from Europe

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Declaration of Authorship

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Prague, May 19, 2017

Dominika Rečková

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Abstract

Easterlin paradox referring to relatively stable levels of happiness and increasing income over time, although these two seem to be correlated at one point in time has became a hot topic among economist researches in recent decades. The thesis extends the usual income analysis to reveal the nature of correlations between material prosperity and happiness. Series of 15 OLS, ordered probit and ordered logit models together with 35 quantile regressions provide a complex analysis of possible happiness drivers. Results find significant correlations between material prosperity and happiness, and between happiness and social life. The relationship between income and happiness might be non-linear and influenced by various factors. Happiness is found to be dependent on relative income and socio-politic living environment which explains the Easterlin paradox.

JEL codes D6, I24, I31 , J31

Key words Happiness, Well-being, Life satisfaction, Public policy, Material prosperity, Reference point, Inequality

Abstrakt

Easterlinův paradox poukazující na relativně stálou úroveň štěstí s rostoucími příjmy v čase, ačkoliv se zdají být v časovém průřezu zkorelované. Práce rozšiřuje běžnou analýzu příjmů a odhaluje povahu korelace mezi materiální prosperitou a štěstím, se stal v posledních letech žhavým tématem mezi ekonomy. Série 15 OLS, ordered probit a ordered logit modelů společně s 35 kvantilovými regresemi poskytuje komprexní analýzu možných příčin štěstí. Výsldky ukazují signifikantní korelace mezi materiální prosperitou a štěstím, a mezi štěstím a společenským životem. Vzah mezi příjmy a štěstím vypadá nelineárně a je ovlivněn mnoha faktory. Bylo zjištěno, že štěstí závisí na relativní výši příjmů a socio-policickém prostředí, což vysvětluje Easterlinův paradox.

JEL klasifikace D6, I24, I31 , J31
Klíčová slova Štěstí, Blahobyt, Životní spokojenost, Veřejná politika, Materiální prosperita, Referenční hodnota, Nerovnost

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Abbreviations

CPI2012	Corruption Perception Index of 2012
DI2012	Democracy Index of 2012
ESRC	Economic and Social Research Council
EU-SILC	European Union - Statistics on Income and Living Conditions
HI	Happiness Index
GNH	Gross National Happiness index
ISCO	INTERNATIONAL STANDARD CLASSIFICATION OF OCCUPATIONS
NUTS	Nomenclature of Units for Territorial Statistics
OLS	Ordinary Least Squares
Oprobit	Ordered Probit
Ologit	Ordered Logit
PPP	Purchasing Power Parity
SE	Standard Error

Master's Thesis Proposal

Author	Dominika Rečková
Supervisor	Mgr. Barbara Pertold-Gebická, M.A., Ph.D.
Proposed topic	The effect of material prosperity on happiness: Evidence from Europe

Motivation Government policies aim at enhancing countries GDP growth in order to increase the material prosperity of their citizens and their wellbeing. But does material prosperity really drive peoples' happiness?

The main objective of my thesis is to evaluate the influence of material prosperity on individuals' perception of well-being taking the specific aspects of the relationship into account. First, the perception of wellbeing might be relative. One can see very poor Africans as happy as the richest Americans, but very unhappy homeless people in California (Diener & Seligman, 2004). This suggests that not only absolute material prosperity but also income inequality and redistribution might play an important role in individuals' wellbeing. Second, the environment people live in is crucial for their mood. For example, in societies with high corruption levels people might find it more difficult to trust each other. Does this fear damage their well-being? Finally, people vary and their character is fundamental for their perception of living. The nature of people can be revealed from their behavior. For example, more active people are by nature optimists.

Hypotheses

Hypothesis #1: People with higher material prosperity are happier.

Hypothesis #2: The relationship is non-linear and depends on peoples reference point.

Hypothesis #3: Corruption environment significantly decreases peoples happiness.

Hypothesis #4: Unequal societies tend to be on average less happy.

Hypothesis #5: Active people are happier.

Methodology The first step of this type of study is to deeply understand the problem of individual happiness. Therefore, I will start the project by summarizing the previous research on the topic. Because the literature concerning individual well-being is vast, I will mainly focus on studies regarding the connection between material prosperity and individual well-being.

As the next step I will identify factors influencing individuals' well-being to inform construction of a regression model. I will base on previous research that will be in accordance with my own intuition and possibly add some factors I would miss. For estimation purposes I will use the EU-SILC 2013 wave which contains an ad-hoc module on individual well-being. Since particular well-being questions use different scales, I will normalize each relevant variable to a 0-1 range.

Furthermore, I will use two types of dependent variables. First, I will use several questions regarding well-being to construct a single index of individual happiness. Next, I will use the happiness and life satisfaction variables as provided in the dataset. I will compare the original variables and the constructed index of happiness/well-being and use both of them in the empirical analysis as dependent variables.

I will take into account the hierarchical data structure. Because the difference between evaluation of happiness between, for example, values 2 and 3 and between values 3 and 4 might be uneven, I will rely on ordered probit and/or logit model. Moreover, as there might be differences between particular levels of material prosperity and the range of answers is bounded, I will apply a logistic quantile regression model described by Bottai *et al.* (2010) to capture potential nonlinearities in the investigated relationship.

I will apply similar model as Groot & van den Brink (1999) to control for the effect of preference drift caused by adaptation of peoples preferences. Groot & van den Brink (1999) show the existence of preference drift on job satisfaction model. They demonstrate that the volume of preference adaptation differs with the level of wage. I will use similar argumentation only with the level of material prosperity and taking into account also past income.

Since the mood in a society can influence the perception of own life satisfaction, I will control for differences between particular countries in order to identify key factors playing role in peoples' well-being. I will focus on the equality in society, political situation, and institution settlement including the level of criminality.

Expected Contribution The proposed study will analyze the connection between material prosperity and individual well-being. I will use a large data set from EU-SILC survey 2013 not used before. The variety of participating countries in the data set will permit for a wider view on the investigated relationship. I will use a systematic approach to evaluate the effects of particular factors on happiness. In contrast to previous studies, I will use both the stated happiness/well-being factor and an index constructed using several measures of well-being.

The data and approach used will bring a new perspective on the relationship between material prosperity and peoples' happiness. To the best of my knowledge no other study has constructed a composed index of happiness so far. Controlling for preference drift in happiness literature is again an innovative approach. This study will explore the most important factors influencing human happiness.

Outline

1. Motivation: Government policies aim at enhancing countries GDP growth in order to increase the material prosperity of their citizens and their wellbeing. But does material prosperity really drive peoples' happiness?

2. Happiness: I will discuss the meaning of happiness and well-being and explain how I will use these terms.
3. Literature review: I will briefly summarize the literature capturing the relationship between material prosperity and peoples well-being / happiness.
4. Data: I describe the sources and data I will use.
5. Methods: I will explain modern regression methods, including the probit, the logit, and the quantile regressions.
6. Results: I will discuss my baseline regressions and robustness checks.
7. Concluding remarks: I will summarize my findings and their implications for policy and future research.

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Author Supervisor

Chapter 1

Introduction

"It is because mankind are disposed to sympathize more entirely with our joy than with our sorrow, that we make parade our riches, and conceal our poverty. ... [W]e pursue riches and avoid poverty. For to what purpose is all the toil and bustle of this world? what is the end of avarice and ambition, of the pursuit of wealth, of power, and preheminence?" (Smith 1790, p.44)

Smith's questions are still relevant today and address the relationship between wealth, sense of life, and happiness. The topic of happiness has been concern of philosophers all over the world for centuries (recall, for example, Confucius, Buddha, Socrates, or Platon). Economists are interested in the understanding and measuring happiness only in recent decades, despite the roots of economics origin in the happiness philosophy of the time of ancient Greece. Two ancient Greek philosophers, Socrates and Aristotle, founded two concepts of what we today call happiness. The *Hedonic* approach that defines happiness trough feelings (pleasures and pains) and the *eudaimonic* approach that focuses on self-realization and functionality. The *Hedonism* emerged by Socrates' scholar, Aristippus of Cyrene, who as his follower, Jeremy Bentham, saw the greatest good in pleasure and a good life in maximizing pleasure (Waterman *et al.* 2008). Similarly, Alfred Marshall assumes rational people to maximize their utility. Happiness can be understood as the utility of life, which is called well-being. Well-being is hard to measure by revealed preferences but the evaluations of subjective well-being approximate them (Benjamin & Heffetz 2012). Tov & Diener (2007) argue, that although self-reported subjective well-being may be open to actual moods, it provides a meaningful information about individual's subjective evaluation of his or her life.

It is important to good understand what influences human happiness because it affects our actions, and motivates political decisions. The importance of happiness is integrated in the US Declaration of independence: "all men are created equal, that

they are endowed by their Creator with certain unalienable Rights, that among these are Life, Liberty and the pursuit of Happiness." (US Congress 1776, p. 1). The British leading research agency ESRC (Economic and Social Research Council) suggests happiness measures as the best measure for policy interventions. The happiness measures belong to the most promising alternative measure of welfare and extend the information contained in GDP (Fleurbaey 2009). The question is, what drives people's happiness.

Economists are interested whether it is income what drives peoples happiness. American economist Richard Easterlin discussed a paradox referring to relatively stable happiness levels over the period 1946 – 1970, although the level of GDP increased, although these two seem to be correlated at one point in time (Easterlin 1973). He also pointed out that subjective well-being depends on the relative (compared with neighbors) rather than absolute income.

The aim of my thesis is to find the nature of the correlations between material prosperity and happiness within 32 European countries. To measure the material prosperity, besides individual income, questions on abilities to pay unexpected expenses and to pay one meal with meat each second day are used.

I test the hypothesis that people with higher material prosperity are happier. I compare the absolute and relative levels of individual income because the material impact on happiness might depend on people's reference point. The reference points should explain the Easterlin paradox as growing average income might increase the reference points and leave average happiness at the initial level. I test whether the below average income decreases happiness. Further, I hypothesize that an environment of corruption decreases happiness. This might be because in high corruption societies the power concentration increases and disturbs the free market competition, which leads to a lower consumer welfare.

I apply OLS, and the commonly used ordered probit and ordered logit regressions (Caporale *et al.* 2009; Stevenson & Wolfers 2008; Blanchflower & Oswald 2004). As measures of subjective well-being I use three different indicators from one year micro-level questionnaire data from Europe. First, the question regarding life satisfaction which is a common practice in the happiness literature (Headey & Wooden 2004; Di Tella & MacCulloch 2008; Caporale *et al.* 2009; Clark *et al.* 2015). Second, the question about the frequency of feeling happy in last four weeks, that to the best of my knowledge was not used as subjective well-being proxy before. Finally, I specify own Happiness Index (HI) based on the frequency of feelings in the past four weeks.

The results yield interesting findings about possible explanation of the Easterlin paradox. The relationship between material prosperity and happiness is non-linear and differ for specific sub-populations of the sample of society.

The thesis is organized as follows: Chapter 2 briefly summarizes the history of happiness and its meaning. Chapter 3 summarizes the current happiness literature

regarding the relationship between happiness and income. Chapter 4 presents the applied econometric models. Chapter 5 describes the data sample. Chapter 6 summarizes the results of the analysis. Chapter 7 discusses the results and its conclusions. Chapter 8 concludes with the summary of main contribution of the thesis.

Chapter 2

Happiness

This chapter briefly explains how the term *happiness* has been understood by scientists and how it will be used in this work. The psychological perspective is crucial for understanding the validity of happiness measures. We will focus on happiness measures, validity of questionnaire data, and the relevance of happiness for governments in separate sub-chapters. The understanding of happiness influences our every day life. What we assume to be the best for humans affects, for example governmental evolution, or the way we educate children (Ryan & Deci 2001).

2.1 Brief history of Happiness and its meaning

Since the very first beginning of science happiness is a hot topic and its understanding developed from antique philosophers to today's scientists. According to Irwin (1986), despite never defined, Socrates understood happiness as what people desire. Current economic theory defines individual preferences similarly. Socrates thought about people as human beings with high moral standards. According to Socrates just a person desiring justice can achieve happiness by effort. For example, even little funds of given money used for others can make people happier than huge funds used for personal purpose. Socrates has based grounds for the Greek ethics that sees happiness as the highest purpose of life (Yu 2005). The founder of ethics in China, Confucius, describes *ren* similar to Socrates' happiness but with deeper sense as human excellence connected with kindness and humanity (Yu 2005).

Another ancient Greek philosopher, Aristotle, considered crucial to focus on the soul in order to being happy rather than on the body, and to live a virtuous life (Ryan & Deci 2001). For Aristotle happiness meant a life of virtuous activity or in other words fulfillment of our human capacities. Such understanding goes beyond the definition and dictates what happiness ought to be rather than what it is in general. "*Happiness* is the usual English translation for *eudaimonia* in Aristotle's

(1985) *Nicomachean Ethics*" (Waterman 1993, p.678). Aristotle's view on happiness has based the *eudaimonic* approach to well-being.

Current use of the term happiness refers to the *hedonic* view of well-being focused on subjective experience (Waterman 1993). For instance, Cambridge Dictionary (2017) defines happiness as "the feeling of being happy" and happy then defines as "feeling, showing, or causing pleasure or satisfaction." Hedonism emerges with Socrates' scholar, Aristippus of Cyrene, who as his follower Jeremy Bentham saw the highest good in pleasure and a good life in maximizing pleasure (Waterman *et al.* 2008). Similarly, Alfred Marshall assumes rational people to maximize their utility. The roots of economics originates in the ancient philosophy of happiness. Utility can be understood as happiness from life. Aristotle condemned the *hedonic* approach as vulgar and as leading to selfish following of own interests (Ryan & Deci 2001). Both Aristotle and Socrates connected happiness to a high-level morality. The morality of their thoughts, however, disappeared trough time.

Simply put, the *hedonic* approach defines happiness trough feelings (pleasures and pains) and the *eudaimonic* approach focuses on self-realization and functionality. I hold the common terminology of Tov & Diener (2007) and understand happiness as subjective well-being; that means as subjectively perceived positive feelings. Happiness is a matter of psychological condition or long-lasting psychological state resulting from inner perceived quality of life, therefore the term subjective well-being fits happiness well.

My thesis focuses on long-lasting happiness rather than on momentary mood. In the rest of the work I will assume happiness and subjective well-being as interchangeable. In the happiness literature subjective well-being is commonly measured by life satisfaction (Headey & Wooden 2004; Di Tella & MacCulloch 2008; Caporale *et al.* 2009; Clark *et al.* 2015). I distinguish life satisfaction from subjective well-being, because in my view life satisfaction combines the *hedonic* and the *eudaimonic* approach. *Hedonic* because of the subjectivity of life satisfaction valuation, and *eudaimonic* because life satisfaction covers also the satisfaction with self-realization.

2.2 The measurement of Happiness

"An individual's life could be described - at impractical length - as a string of moments." (Kahneman & Riis 2005, p. 285)

How to evaluate these moments of life in terms of happiness is a hard task, because happiness is highly subjective. According to the psychometric approach, emphasizing non-existence of any reason why unobservable mental states cannot be measured, it is possible. Psychometric approach was developed at the beginning of 20th century for analyzing unobservable personal characteristics like intelligence (IQ) (Jones

& Thissen 2006). Psychometric approach uses construct validation - the measure is validated if it behaves as expected (Angner 2013). According to that approach the measurement of happiness was many times validated. For example, Wilson (1967) summarizes literature focused on correlations between questions on happiness and other constructed ways to measure happiness e.g. elation-depression scale shows high correlations that confirm the validity of self-ratings; Oishi *et al.* (2003) present a positive relationship between positive or exciting events and evaluation of life satisfaction. The measures of happiness detect a self-valuation of individual well-being.

Nobel laureate in economics, Israeli-American psychologist, Daniel Kahneman, following his two types of self (experiencing and remembering)[1] distinguishes two types of well-being: *experienced* - measured by momentary experience sampling, and *remembered* - measured by e.g. evaluation of life satisfaction (Kahneman & Riis 2005; Kahneman 2011). The approaches to measurement of well-being are based on these two principles. First, a direct measure that detects the experience at every moment and averages it for overall evaluation of the subjective well-being. This principle provides precise measure of *experienced* well-being but is very hard to perform. The complications arise, for example, while measuring the intensity of the experienced feelings, or while estimating which moments are for the individual possibly more important than others. Second, an indirect measure that asks people to evaluate their well-being. Records achieved in the way of subjective well-being Kahneman calls *remembered* well-being. *Experienced* and *remembered* well-being are interrelated (Kahneman 2011); the frequency of happy events (e.g. party, marriage, born of child) in life can influence overall mood; and the overall mood influences the feelings during all events.

Few researchers base on the direct measure of happiness. For example, psychologists Wenas *et al.* (2016) use two constructs to measure happiness - valence and arousal based on Indonesian language lexicons analysis. Simply put, they measure the frequency of expressive and emotional words in Indonesian twitter conversation, and detect more positive words. That measure is biased by omitting people not using Twitter.

The bulk of happiness literature concentrates on the indirect method using questionnaires. Individual data are sampled from questions like "Taking all things together, how happy would you say you are?" (European Social Survey 2014) or "Overall, how satisfied are you with your life nowadays?" (EU-SILC 2013). Possible answers are either word expressions like good, quite good, and bad in a small scale questionnaires, or a numeric scale expressed by words only in the extremes. In past three- or four-point scales questions were usual (Eurobarometer Data Service

[1] According to Kahneman (2011) the experiencing self 1 reacts fast and naturally to all external stimuli and problems while the remembering self 2 reacts slow, ponders, and solves the problems applying learned procedures. Kahneman calls it fast and slow thinking.

2017; Veenhoven 2000), but current practice favors the ten-point scale for its greater differentiation (Brockmann *et al.* 2009).

Kahneman & Krueger (2006) have recently introduced so called U-index that they call also the misery index. It measures the proportion of time spent in an unpleasant state. They ask people to evaluate their feelings during activities the respondents have done during the day. Kahneman & Krueger (2006) then calculate the percentage of time when negative feelings (frustrated/annoyed, depressed/blue, hassled/pushed around, angry/hostile, worried/anxious, criticized/put down) are leading the positive feelings (happy, warm/friendly, enjoying myself); this percentage they call U-index. The U-index measures the *experienced* happiness, and overcomes a cardinal expression of happiness.

Economists do not use cardinal utility function because people are not able to express their feelings on a limited scale in a consistent way. For example, let a man first evaluate the following: to eat an apple brings utility of 2 on a 10 point scale, having a new dog 5, and having a new cat 4. Now the man wants to express having a new rabbit is better than new cat but worse than new dog, which is not possible taking his previous rating as immutable. Economists therefore use ordinal utility function. In a sense happiness can be understood as a utility from life and then the question is: If you cannot ask people to evaluate their utility from goods cardinally, how could you ask them to cardinally evaluate their happiness? The problem with utility measure is the comparability between goods and ability to correctly assess the portion of utility from particular good. Happiness or life judgment is at a superior level - it includes overall evaluation of the state of mind, while the utility from good represents only part of this overall state of mind. Given a limited scale with the possibility to answer "*do not know*" people are able to subjectively appraise their life. The scale for the evaluation of happiness can be understood as a yardstick informing on how much percentage the person is satisfied. Although self-reported subjective well-being may be open to actual moods, it provides meaningful information about individual's subjective evaluation of his or her overall life satisfaction (Tov & Diener 2007).

2.3 The challenges of happiness measures

The reports of subjective well-being can provide a meaningful information about people's life satisfaction only when accomplished properly. To avoid what Kahneman *et al.* (2006) call *focusing illusion* - influencing the respondents - proper structure of the questionnaire is important.

Questions should be ordered from the abstract ones to the concrete ones to avoid coloring. For example if you first answer a question how many times in last four weeks did you feel happy and then evaluate the life satisfaction, you will probably

report a higher level than if you would you first answer a question of how many funerals did you attend last year. In this case the question on life satisfaction should be asked first. Further, a proper constructed questionnaire uses emotionally neutral words to avoid positive or negative bias (Schwarz & Strack 1999).

At the same time the question should provide enough information to make what is being asked clear; otherwise everybody would imagine a different question (Angner 2013). This is especially hard for translators, when they have to prepare two same questionnaires in different languages. Despite the effort of not interfering the respondents, people are influenced by many other aspects than the structure of the questionnaire. First of all, their actual mood, then their experiences from last week, and also the duration of the questioning can play role. This, however, should not cause a bias in large representative samples (Kahneman & Krueger 2006). In large representative samples the influential factors are random and thus do not cause bias.

Hot debate among happiness scientists is about the time comparability and whether cross-section or panel data are more informative. Easterlin (2003) points out that people‘s expectations and aspirations adapt to new circumstances; he adds that the adaptation is much stronger in pecuniary domains and even there the adaptation is not complete. Easterlin (2005) shows that with newly acquired goods the material aspirations rise faster. This means that people re-evaluate their scales during time and makes the time comparison of relationship between life satisfaction and other factors imprecise. Simply because the re-evaluation changes the relationship of life satisfaction or happiness to other factors. This partially explains the so-called “Easterlin paradox” referring to a relatively stable happiness over time, although increasing level of income/GDP, although these two seem to behave together at one point in time (Easterlin 1973; 2001).

The stability of happiness over time can be also explained in part by stability of personality (Richard & Diener 2009). The studies capturing the socioeconomic factors generally explains a very little portion of the happiness variation (Inglehart & Klingemann 2000). Inglehart & Klingemann (2000) show that cultural and historical factors play a crucial role as well as genetic. Lykken & Tellegen (1996) made an experiment with monovular and fraternal twins and show that only the monovular twins report similar levels of happiness even with different life experience.

When the personality plays a crucial role for subjective happiness, we should concentrate on factors influencing the personality. Personality evolves during time only negligibly because the environment people are living in is often stable; outer factors such as education influence the personality to some substantial level (Mirza & Ivanova 2016). The time-invariance of personality traits might cause the average happiness flat in time. When observing the diversity of environment and conditions

people are living in at one point in time, we can detect factors other than genes influencing the overall subjective happiness. From that point of view the cross-sectional data seem to be more appropriate, unless a preference drift is incorporated in the panel data model.

The literature indicates that the information people use to make life satisfaction judgments is largely systematic and personally relevant; therefore the reported life satisfaction conveys meaningful information about an individual‘s evaluation of his or her life (Schimmack *et al.* 2002; Oishi *et al.* 2003).

2.4 Happiness in the legislation

“Whatever the form or constitution of government may be, it ought to have no other object than the general happiness.” (Paine 1792, p. 233)

Happiness is a natural aim of humans; everybody wants to be happy. The term “*public happiness*” introduced Ludovico Antonio Muratori already in 1749 and saw it as a goal of public policy (Dixon 1997). Despite this, only few nations have the happiness of citizens as one of the governmental purposes. The importance of happiness is integrated in the US Declaration of independence: “all men are created equal, that they are endowed by their Creator with certain unalienable Rights, that among these are Life, Liberty and the pursuit of Happiness.” (US Congress 1776, p. 1). Happiness is in the declaration emphasized once more time as the main goal of government together with safety. The reality in the US might not correspond to this, however. The main indicator of US‘ prosperity is GDP as almost everywhere in the world and the measure of happiness, to the best of my knowledge, does not occur in governmental materials.

The only state that currently follows happiness as the main indicator of prosperity is Bhutan with almost 800 thousand inhabitants (National Statiscits Bureau). They have a special measure for it - Gross National Happiness Index (GNH), that covers nine domains of interest: Living standards, Education, Health, Environment, Community Vitality, Time-use, Psychological well-being, Good Governance, and Cultural resilience and promotion (GNH Centre Bhutan 2017). The fourth king of Bhutan, Jigme Singye Wangchuck, who introduced the GNH index in Bhutan in 1970s, stated that “Gross National Happiness is more important than Gross National Product.” The GNH includes much more than only subjective well-being or happiness; it tries to capture the overall well-being of the citizens. The name Gross National Happiness index is, however, a bit misleading. The question of suitability of GNH for measuring peoples‘ well-being remains open. Nevertheless, measuring happiness can help to investigate the effects of introduced policies or institutions (Clark *et al.* 2008; Bates 2009).

According to Easterlin (2003) the policies aimed to improve well-being focus on

socioeconomic aspects. He raises the question of whether the policy makers should decide also about individual preferences. Easterlin (2003) argues that the *hedonic* adaptation is stronger in pecuniary than non-pecuniary domains and government should better inform citizens about this effect and stimulate them to focus more on "goods" from non-pecuniary domain like social relationships, happy marriage, or health. Government should act in light of the individual freedom and the ability of everyone to decide about himself or herself the best. Government does not have to set prohibiting laws in order to influence people. The representatives of a state can set a moral laws by their behavior and proclamations.

The happiness topic belongs to the field of psychologists and philosophers and only recently economists began to inspect it too. It slowly gets into governmental awareness. In the United Kindom an independent organization "*What Works Centre for Wellbeing*" that samples accessible evidence on well-being is supported by UK's leading research agency ESRC (Economic and Social Research Council). Recent report of *What Works Centre of Wellbeing* recommends life satisfaction as best measure of various policy interventions (Layard 2016). Although measuring happiness is not common yet, it promises an alternative to GDP for measurement of national welfare.

Chapter 3

Literature Review: Income & Happiness

Happiness research is a well-rooted topic in the current literature. Philosophers concern themselves with happiness since ancient Greece. Only in recent decades also economists began to be interested in understanding and measuring happiness. The current research focuses on the relationship between happiness and income and on further determinants of happiness.

The first most famous and from today's view a rigorous study about happiness was written by an American economist Richard Easterlin. Easterlin (1973) discussed a paradox referring to relatively stable happiness levels over the period 1946 – 1970, although the level of GDP increased, although these two seem to be correlated at one point in time. He also pointed out that subjective well-being depends on the relative (compared with neighbors) rather than absolute income. Blanchflower & Oswald (2004) confirm both Eastelin's findings (Easterlin paradox and the importance of relative income) on micro-level US and British data from 1970s to the late 1990s but highlight also influential non-financial variables like education, age, being married or religion. They connect higher happiness to higher income and document a U-shape relationship of happiness and of life satisfaction with age, with minimum around the age of 40. Similarly, for example, Hagerty & Veenhoven (2003) refer to increasing happiness with growing income on a macro-level data form 21 countries between 19070s and 1996; and Stevenson & Wolfers (2008) confirm the positive correlation between subjective well-being and income, both on aggregated and on individual data. These findings indicate happiness might not be flat over time, as Easterlin paradox assumes.

Easterlin (2016) re-asses the paradox once more time with a macro-level data from the US in the period 1946 – 2014 with the same discovery of practically flat happiness and tripled GDP. GDP, however, might not be a good indicator of peoples income, as the distribution of income might be uneven within the society (see Alvaredo (2011)

Piketty & Saez (2001) for the US income distribution). Income inequality partially explains Easterlin paradox, because economic growth is often accompanied by rising income inequality that decreases life satisfaction. Controlling for income inequality Oishi & Kesebir (2015) find positive relationship between mean life satisfaction and GDP per capita on data from 34 countries. Clark *et al.* (2015) explain the Easterlin paradox (on a macro-level data) by extension of public goods with growing GDP per capita which equalize the average happiness within country and between countries as also public goods become comparable between countries. The equalization of individual happiness might be the cause of the Easterlin paradox – stable average happiness level despite growing GDP per capita.

The literature provides several further possible explanations for the Easterlin paradox. First, the environment people are living in seems to be deterministic for the perceived happiness. The environment depends a lot on established institutions that might influence the distribution of income in a country, quality and quantity of public goods, unemployment, freedoms in the society, and other living conditions. Not surprisingly the most influential factors differ between developing and rich countries. For example, Veenhoven (2000, p.18) finds (on a macro-level data from 54 countries) a positive correlation between happiness and political and private freedom but only in "rich and capable countries." Easterlin *et al.* (2010) and Easterlin (2015) argue for the existence of Easterlin paradox with the fast growing GDP and almost stable life satisfaction in China, South Korea, Chile, and European transition countries. Such fast growth of GDP might be, however, accompanied with many other social changes like, for example, deepening inequality in a society or increased power concentration of international subjects. The evidence for developing countries is low; Easterlin & Sawangfa (2010) find no significant relation between life satisfaction and GDP growth across 13 developing countries from three continents. On the other hand, Graham & Pettinato (2002) indicate positive relationship between income and happiness on a micro-level panel data from Russia and Peru. They find also impact of education and of age on happiness, and controlling for income mobility, state that relative income differences influence happiness more than absolute ones. The relative income differences have the biggest impact on the middle class, indicating social comparison does not matter so much for very poor or very rich class. Also Easterlin *et al.* (2010) see the reason for the Easterlin paradox in social comparison and hedonic adaptation. Both might be influenced by institutions and differ for developing and rich countries. The role of institutions and living environment on perceived life satisfaction is therefore worth further inspection.

One of the greatest happiness researchers, British economist, Andrew J. Oswald has summarized that the happiness literature finds no significant impact of income on happiness (Oswald 1997). Using a composite index of happiness from four-point scale General Health Questionnaire he has found with Andrew Clark a negative impact of unemployment on happiness – on a micro-level data controlling for individual income (Clark & Oswald 1994). Negative impact of unemployment on happiness was found also by Winkelmann & Winkelmann (1998); Di Tella *et al.* (2001); Wolfers (2003) and Helliwell (2003). Di Tella *et al.* (2001) and Helliwell (2003) say that unemployment has greater impact on happiness than inflation (showing it on micro-level data). Same conclusion was reached by Wolfers (2003) (on both micro- and macro-level data) who also adds that unemployment volatility decreases perceived happiness and that factors like unemployment or marital status influence happiness more than income.

Studies that use macro-level data insert average levels of subjective well-being proxies and country GDP or GDP growth (in a natural logarithm) into ordered probit and ordered logit models. Studies using micro-level data apply ordered probit and ordered logit models too, but insert individual income and well-being proxies. OlS regression are also not rare (Easterlin 2015; Headey & Wooden 2004). Some studies combine the approaches. For example, Di Tella *et al.* (2001) predict life satisfaction by ordinary least square (OLS) on micro-level using personal characteristics only, and then the predicted values regress on country characteristics. They use ordered probit model as robustness check because the dependent variable is not continuous.

The literature does not provide conclusive resolution about the relationship between income and happiness but broadly agrees that happiness depends on many aspects of life. My work approaches the issue more generally and focuses on material prosperity instead of income only. Majority of the aforementioned studies use macro-level data for their accessibility, as large cross-country samples contain micro-level data rarely. Studies using micro-level data base the analysis more often on household income that might provide inaccurate information about the accessible income of individuals (Rojas 2011). This thesis analyzes individual income and other micro-level data from a large sample of European countries. The main contribution is the examination of the proposed relationship between happiness and income with extension to various life circumstances and other aspects of material prosperity.

Chapter 4

Methodology

The motivation of my thesis lies in the speed of current economic development. Adam Smith commented on the race for money with a question: "what is the purpose of all the toil and bustle of this world?" (Smith 1790, p.44) Does money buy happiness? Given the generally low explanatory power of the happiness models, the aim of my thesis is to find the correlations between personal /environmental characteristics and happiness. I will test the hypothesis that people with higher material prosperity are happier. I will compare the absolute and relative levels of individual income because the material impact on happiness might depend on people's reference point. The reference points should explain the Easterlin paradox as growing average income might increase the reference points and leave average happiness at the initial level. I will test, whether less than average income decreases happiness. Further, I hypothesize that corruption environment decreases happiness. Because in high corruption societies the power concentration increases and disturbs the free market competition which leads to a lower consumer welfare.

I will apply OLS and commonly used ordered probit and ordered logit regressions (Caporale *et al.* 2009; Stevenson & Wolfers 2008; Blanchflower & Oswald 2004). I will use three different subjective-happiness measures from one year micro-level questionnaire data from Europe. First, I use the question regarding life satisfaction which is a common practice in the happiness literature (Headey & Wooden 2004; Di Tella & MacCulloch 2008; Caporale *et al.* 2009; Clark *et al.* 2015). Second, I use the question about the frequency of feeling happy in last four weeks that to the best of my knowledge was not used as subjective well-being proxy before. Finally, I specify own Happiness Index (HI) based on the frequency of feelings in the past four weeks. All three subjective-well being indicators will range from 0 to 10. Chapter 5 summarizes further details about the data used. This chapter describes the applied methodology.

4.1 The main model with personal characteristics

The utility that people have from life, their subjective well-being, is assumed to be determined by individual socio-economic characteristics. Therefore, I specify the OLS regression model as follows:

$$SWB = \beta_0 log(income) + \boldsymbol{X\beta} + u \quad u|X \ N(0, \delta^2), \tag{4.1}$$

where SWB denotes one of the subjective well-being indicators, log(income) denotes the natural logarithm of individual's yearly income expressed in Euro Purachasing Power Parity (PPP) of 2012 for between-country comparability, $\mathbf{X}$ is a vector of personal characteristics, and u is a disturbance term. As is common in the happiness literature, income is in logarithmic form because subjective well-being might react rather to proportional than absolute income change (Stevenson & Wolfers 2008; Helliwell 2003; Graham & Pettinato 2002). I will add also other proxies identifying good financial health, or in other words, the material prosperity. Between the personal characteristics I will include commonly used characteristics as education, marital status, age, and age^2 because former studies have found concave relationship between subjective well-being and age (Graham *et al.* 2004; Blanchflower & Oswald 2004; Helliwell 2003). As further outer factors might cause endogeneity problem, I will add as many personal and country characteristics as possible. For example, the number of hours worked per week or a dummy variable for former communist countries. Economic development and social culture in the post-communist countries might differ from the remaining European countries.

Nevertheless, people living in one country are likely to share experiences and have common history and culture that forms their personalities (Tov & Diener 2007). The valuations of subjective well-being coming from one country are then likely to be dependent. Therefore, I employ study level clusters to avoid within-country heterogeneity. For the same reason I specify the model with country dummy variables, that capture the country effect on subjective well-being, in a following way:

$$SWB = \beta_0 log(income) + \boldsymbol{X\beta} + \boldsymbol{C\gamma} + u \quad u|X \ N(0, \delta^2), \tag{4.2}$$

where $\mathbf{C}$ is a vector of country dummy variables.

The development of former iron curtain countries might be similar. Therefore it is reasonable to add a common factor for them that will represent the politic-cultural impact of post-communism on life satisfaction. I extend the Equation 4.2 and respecify it as follows:

$$SWB = \beta_0 log(income) + \boldsymbol{X\beta} + \boldsymbol{C\gamma} + \gamma_0 curtain + u \quad u|X \ N(0, \delta^2), \tag{4.3}$$

where *curtain* is a dummy variable that equals 1 if the respondent comes from one of the 12 post-communist countries of the sample, and zero otherwise.

Adding the country dummy variables should solve possible endogeneity coming form culture of particular countries that might influence both income and through well-being the subjective well-being. To the best of my knowledge, there is no reason to assume other aspects that might influence the explanatory variables and subjective well-being at the same time. The model might, however, suffer from omitting variable bias as the sample used does not contain all wished variables. For example, religion was found to positively affect subjective well-being (Settle 2014; Lelkes 2006; Blanchflower & Oswald 2004) but the data from EU-SILC does not contain question regarding religiousness. Nevertheless, the model should still provide consistent estimates.

4.2 Quantile regression

The OLS models predict the average effects on the whole sample population. There might be, however, interesting differences between various segments of the sample population. Estimation of conditional quantiles enables the comparison between different segments of population and is widely used in the economic welfare literature (Yuan & Golpelwar 2013; Binder & Freytag 2013; Gomanee *et al.* 2005). Therefore, I specify the quantile regressions according to Wooldridge (2010) as follows:

$$SWB = \boldsymbol{X}\boldsymbol{\beta} + \boldsymbol{C}\boldsymbol{\gamma} + u, \quad Quant_{\tau}(u|X) = 0, \tag{4.4}$$

where τ represents the fraction of population randomly drew from the population, the fraction is called quantile, $(0 < \tau < 1)$. For good display of the differences between various segments of the sample population, I will use 10th, 25th, 50th, 75th, and 90th quantile.

4.3 Model identifying within country happiness drivers

Subjective well-being does not depend only on the personal characteristics, but also on the living environment. The living environment differs across countries and might be determined by the conditions within the particular country. When the data comes from two separate levels of aggregation like in this case, the best practice is to apply a two-step procedure (Donald & Lang 2007). The first stage estimates (based on first level on aggregation data) are regressed on the second level of aggregation data. Therefore, I apply a two-step procedure and regress the estimated country effects ($\hat{\gamma}$) weighted by their precision (inverse of the standard deviation) from the Equation 4.2

on country specific characteristics. The second stage is a Weighted Least Squares (WLS) regression with robust standard errors specified as follows:

$$\hat{\gamma} = \boldsymbol{Z\alpha} + \boldsymbol{P\iota} + \boldsymbol{W\kappa} + v + (\hat{\gamma} - \gamma) \quad v|X \; N(0, \epsilon^2 + \delta^2), \tag{4.5}$$

where **Z** is a vector of country-specific economic indicators; **P** denotes political situation within the country; and **W** denotes weather in the country. The model includes error term coming from the frist stage – the differeces between the estimated and true country effects $\hat{\gamma} - \gamma$, and a disturbance term v. Table 4.1 describes all explanatory variables taken into account. I use stepwise regression to choose the most influential variables. Stepwise regression is a useful tool that based on significance level of the variables builds models in a sequential fashion (Lum & Wong 2003). Either forward stepwise regression begins with empty model and adds the variables or backward stepwise regression begins with full model and removes the variables. My criterion for adding a variable is 0.11 t-test p-value and for removing t-test p-value 0.12 (for details of the stepwise regression see Draper & Smith (1981)).

Table 4.1: List of explanatory variables for the Equation 4.5

Variable	Description	Source
gdp	Gross Domestic Product of the year 2012 in Euro PPP	Eurostat
gdp_grow	GDP growth between 2011 and 2012 in %	Eurostat
gov_expend	Governmental expenditures in 2012 in Euro PPP	Eurostat
Gini	Gini coefficient of equalized disposable income that captures the income inequality of the country, 0 represents perfect equality and 100 perfect inequality.	Eurostat
unemploy	Average unemployment in 2012	Eurostat
DI2012	Democracy Index of 2012 (from 0 to 10, where 10 means full democracy)	EIU
CPI2012	Corruption Perception Index of 2012 (from 0 to 100, where 100 means no corruption)	TI
rainy_days	Number of days with above average (from the countries in the sample) precipitation	Agri4cast
temp	Mean air temperature in °C	Agri4cast
sunny_days	Number of days with above average (from the countries in the sample) solar radiation	Agri4cast
sun_avg	Average solar radiation in KJ /m^2 /year	Agri4cast

Source: EIU means The economist Intelligence Unit (2012) and TI means Transparency international database.

4.4 Robustness checks

The OLS model assumes continuous dependent variable, but the measures of subjective well-being achieve only limited discrete values. For the discrete nature of the subjective well-being data, ordered response models are better suited and hold also the ordering. Therefore, ordered probit and ordered logit models serve as a robustness check of the OLS analysis. Their use is a common practice in the happiness literature (see for instance Caporale *et al.* (2009); Stevenson & Wolfers (2008); Blanchflower & Oswald (2004)). I use the ordered response models defined according to Wooldridge (2010) as follows:

Latent variable model:

$$SWB^* = \beta_0 log(income) + \boldsymbol{X\beta} + \boldsymbol{C\gamma} + u \quad u|X \ N(0,1), \tag{4.6}$$

where **X** does not contain a constant and for the values of **SWB** holds:

$$\begin{aligned} SWB =& 0 \qquad if \quad SBW^* \leq \alpha_1 \\ SWB =& 1 \qquad if \quad \alpha_1 < SWB^* \leq \alpha_2 \\ & \cdot \\ & \cdot \\ & \cdot \\ SWB =& 10 \qquad if \quad SBW^* > \alpha_{10}, \end{aligned} \tag{4.7}$$

where $\alpha_1 < \alpha_2 < ... < \alpha_{10}$ are unknown threshold levels. For achieving conditional distribution of SWB given all explanatory variables X each response probability is defined as follows:

$$\begin{aligned} P(SWB =& 0|\boldsymbol{X}) \qquad = P(SWB^* \leq \alpha_1|\boldsymbol{X}) = \boldsymbol{\Phi}(\alpha_1 - \boldsymbol{X\beta}) \\ P(SWB =& 1|\boldsymbol{X}) \qquad = P(\alpha_1 < SWB^* \leq \alpha_2|\boldsymbol{X}) = \boldsymbol{\Phi}(\alpha_2 - \boldsymbol{X\beta}) - \boldsymbol{\Phi}(\alpha_1 - \boldsymbol{X\beta}) \\ & \cdot \\ & \cdot \\ & \cdot \\ P(SWB =& 10|\boldsymbol{X}) \qquad = P(SWB^* > \alpha_{10}|\boldsymbol{X}) = 1 - \boldsymbol{\Phi}(\alpha_{10} - \boldsymbol{X\beta}). \end{aligned} \tag{4.8}$$

The parameters $\boldsymbol{\alpha}$ and $\boldsymbol{\beta}$ are estimated with Maximum Likelihood Estimator with the following log-likelihood function for ordered probit:

$$l_i(\boldsymbol{\alpha}, \boldsymbol{\beta}) = 1[SWB_i = 0]log[\boldsymbol{\Phi}(\alpha_1 - \boldsymbol{X_i\beta})] + 1[SWB_i = 1]log[\boldsymbol{\Phi}(\alpha_2 - \boldsymbol{X_i\beta}) - (\alpha_1 - \boldsymbol{X_i\beta})] + ... + 1[y = 10]log[1 - \boldsymbol{\Phi}(\alpha_{10} - \boldsymbol{X_i\beta})]. \quad (4.9)$$

The log-likelihood function for ordered logit model is defined identically, except, the distribution function $\boldsymbol{\Phi}$ is replaced by $\boldsymbol{\Lambda}$. I assume that the parallel regression assumption holds in the subjective well-being case. That means the probabilities of all levels of the dependent variable, in this case subjective well-being, are the same except for the cut points α. In other words, the probabilities differ across the levels of subjective well-being only because the cut points differ.

Chapter 5

Description of the data

The empirical analysis presented in this thesis uses individual-level data from Eurostat, the EU Statistics on Income and Living Conditions 2013 wave (EU-SILC). In 2013, on top of usual household and individual socio–economic characteristics the survey contains a well-being module with 22 questions regarding individual perception of happiness and their living environment. The EU-SILC survey covers 32 European countries. To capture the country level characteristics the micro-data is augmented with GDP and GDP growth from Eurostat, indexes denoting social and political situation across countries from Transparency International, and The Economist Intelligence Unit 2013, and weather indicators that might influence human psychic like average number of sunny days from EU Agri4Cast Resource Portal of European Commission. The analysis is done in statistical program STATA including charts and data preparation; only data from Agri4Cast are first processed in R.

5.1 Statistics on Income and Living Conditions

EU-SILC 2013 data were obtained upon request and approval of a research project from Eurostat.[1] As the data are individual and therefore confidential, they are provided for scientific purposes only.

The EU-SILC survey collects comparable micro data on income, social exclusion, living conditions, health, labor, education and other socio-economic indicators. Additionally each year the survey contains an ad-hoc module concerning special issue; in 2013 it was a module on well-being. The EU-SILC survey consists of register data and data collected via interviews done from January to April 2013 and contains 511,504 respondents aged 16 and over from 32 European countries listed together with number of observations used for the analysis and their sample weights in Table 5.1. The EU-SILC 2013 sample is incomplete and contains mistakes (other than defined values); the well-being module has at most 373,473 respondents and several

[1] The responsibility for all conclusions drawn from the data lies entirely with the author.

observations in other socio-economic data are missing. I analyze only answers of the employed individuals. Otherwise the answers might not be comparable and the analysis would be biased. I use the individual income of employees which might better correspond to the available income of the individual than in the micro-level data commonly used household income (Rojas 2011). Out of 506,243 respondents reporting their current economic status only 206,140 are employees. The well-being module has at most 148,017 employed respondents. Further 6 observations with negative Non-Cash employee income were omitted as it should achieve only values 1 – 999,999.99 in national currency. Under the assumption that answers to the well-being module questions are randomly missing, the analysis on the restricted sample should provide consistent results. The data for the analysis are weighted by the provided sample weights based on nationally representative probability sample of the country population.

Table 5.1: List of EU-SILC 2013 countries & included observations

Country	Obs	Weight	Percent
Austria	4,446	2876595.44	2.09%
Belgique	4,173	3275243.72	2.38%
Bulgaria	3,386	2202868.17	1.60%
Switzerland	6,255	3560734.94	2.59%
Cyprus	4,251	299497.59	0.22%
Czech Republic	4,520	2481847.00	1.80%
Germany	9,201	28656416.70	20.82%
Denmark	2,586	1165061.74	0.85%
Estonia	4,473	445213.78	0.32%
Greece	3,137	2189587.36	1.59%
Spain	7,900	12583634.30	9.14%
Finland	4,337	1027800.63	0.75%
France	6,448	16169653.20	11.75%
Croatia	1,613	570849.26	0.41%
Hungary	6,845	2526029.00	1.83%
Ireland	2,123	822739.31	0.60%
Iceland	1,530	61332.54	0.04%
Italy	7,726	11048654.50	8.03%
Lithuania	3,363	929966.91	0.68%
Luxembourg	2,787	147645.61	0.11%
Latvia	4,176	612079.49	0.44%
Malta	2,429	92113.05	0.07%

Continued on next page

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Country	Obs	Weight	Percent
Netherlands	4,909	3146205.62	2.29%
Norway	3,500	1345752.85	0.98%
Poland	7,640	8756604.34	6.36%
Portugal	3,580	2492625.87	1.81%
Romania	4,721	6419644.89	4.66%
Serbia	2,962	1131071.95	0.82%
Sweden	2,953	2204482.52	1.60%
Slovenia	2,755	267613.26	0.19%
Slovakia	5,646	1824872.25	1.33%
United Kingdom	5,741	16328908.00	11.86%
Total	142,112	137,663,346	100%

5.1.1 The well-being module

The well-being module contains questions summarized in Table 5.2. Possible answers are of four types: first, people evaluate questions about satisfactions or trust on a 0-10 scale; second, people give evidence on how often in the past 4 weeks they felt certain moods where 1 - all of the time, 2 - most of the time, 3 - some of the time, 4 - a little of the time, 5 - none of the time; third, people answer yes-no questions whether they have someone to discuss personal matters with or the possibility to ask someone for help; lastly, they express their valuation of physical security where 1 - Very safe, 2 - Fairly safe, 3- A bit unsafe, 4 - Very unsafe. In each type of question possible answer is also "Do not know." These answers (941 in total for life satisfaction) are excluded from the sample as representing indefinite subjective opinion of the respondent. The share of such answers by country is tiny and generally uniform. The only exception, when "Do not know" answer is not excluded, is question regarding personal matters. This answer serves as a proxy for having a good friend. Having a friend to discuss personal matters with signals a good social relationships that might positively influence subjective well-being. The "Do not know" answer (973 in total) signals uncertainty, and therefore is considered as not having a good friend. Having a friend then represents only the strong friendships. The estimate of having the friend for sure influence on the subjective well-being will be then lower bound of the friendship effect. Because if the individual would have such a good friend and despite answers "Do not know," considering him/her not having a friend will lower the estimate. Further, omitting this "Do not know" answer should cause an unnecessary loosing of information and possibly biases the results because it disturbs the random

sampling (more on the random sampling issue in **??**). Life satisfaction is measured via question of type: *Overall, how satisfied are you with your life nowadays?*; where 0 means Not at all satisfied, 10 means Completely satisfied and 99 Do not know. The questions regarding mood are of type: *How much of the time over the past four weeks have you been happy?* on a 1-5 scale described above.[2]

As a result of EU-SILC 2013 incompleteness, the sample used in the analysis where well-being is proxied by life satisfaction consists of 142,112 employed respondents. This constitutes about 70% of all employed observed in EU-SILC 2013. Under the assumption that answers to life satisfaction questions are randomly missing, the analysis on this restricted sample should provide consistent results. Table 5.2 summarizes this sample and shows that as in most other happiness studies, the well-being indicators are skewed to the right (Groot & Maassen Van Den Brink 2000). For example, mean life satisfaction is 7.368 and median 8. Figure 5.1 depicts the distribution of life satisfaction observations and normal distribution estimate for comparison. The empirical values are not censored suggesting that people report their true meaning and the 0-10 scale does not bound them. Figure 5.2 pictures the mean life satisfaction for from countries in the sample. The highest values (above 7.5) reach northern countries which is common in the happiness literature (Kahneman & Riis 2005), but also, for example, Romania, Austria, Switzerland, or Belgium. The lowest average life satisfaction (under 5.5) have people in Bulgaria.

The well-being module of EU-SILC 2013 is incomplete, Table 5.2 provides the specific number of observations without the "Do not know" answers, that are available for non-missing values of other characteristics of interest. As consequence of missing answers about the mood, the robustness models with frequency of feeling happy and with Happiness Index as proxy of subjective well-being use only 140,515 and 138,918 observations, respectively.

5.1.2 The subjective well-being indicators

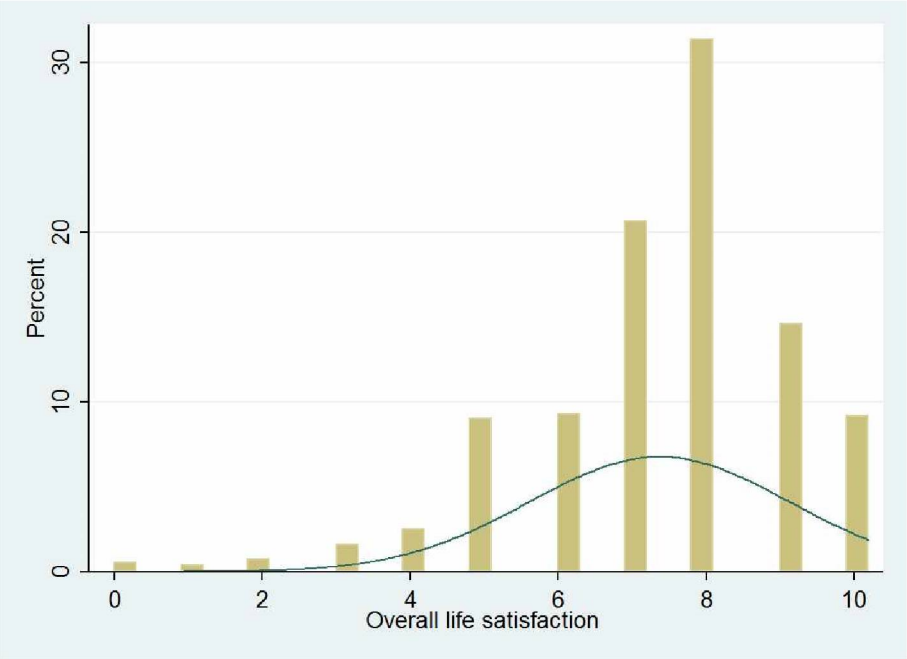
The use of life satisfaction as the measure of subjective well-being is common practice in the happiness literature (Headey & Wooden 2004; Di Tella & MacCulloch 2008; Caporale *et al.* 2009; Clark *et al.* 2015). In this thesis the subjective well-being is besides life satisfaction measured also by the frequency of feeling happy during the past four weeks. In the well-being module the question is called Being happy and as was mentioned earlier ranges from 1 to 5 where 1 - all of the time, ..., 4 - a little of the time, 5 - none of the time. For comparability with the life satisfaction, being happy is rescaled to values 0 - none of the time, 2.5 - A little of time, 5 - Some of the time, 7.5 - Most of the time, and 10 - All of the time. Life satisfaction might capture both

[2]Complete information about the form of EU-SILC questionnaire can be found in EUROSTAT (2013a).

Table 5.2: Well-being module of EU-SILC 2013 Questions

Variable	Obs	Mean	Std. Dev.	Min	Max	P50
Overall life satisfaction	142112	7.368	1.767	0	10	8
Meaning of life	139740	7.627	1.704	0	10	8
Satisfaction with financial situation	142365	6.374	2.209	0	10	7
Satisfaction with accommodation	142558	7.522	1.916	0	10	8
Satisfaction with commuting time	140174	7.394	2.358	0	10	8
Being very nervous - how often	141332	3.61	1.003	1	5	4
Feeling down in the dumps	141035	4.165	.939	1	5	4
Feeling calm and peaceful	141508	2.478	.912	1	5	2
Feeling downhearted or depressed	140937	4.028	.925	1	5	4
Being happy	140515	2.353	.844	1	5	2
Job satisfaction	141899	7.148	2.036	0	10	8
Satisfaction with time use	141972	6.288	2.299	0	10	7
Trust in the political system	137989	3.845	2.689	0	10	4
Trust in the legal system	137464	4.908	2.607	0	10	5
Trust in the police	137530	6.006	2.383	0	10	6
Satisfaction with personal relationships	142139	7.914	1.778	0	10	8
Personal matters - anyone to discuss with	143233	.942	.234	No	Yes	1
Help from others available (you can ask for)	135887	1	0	Yes	Yes	1
Trust in others	140955	5.847	2.17	0	10	6
Satisfaction with recreational or green areas	141348	7.229	2.219	0	10	8
Satisfaction with living environment	142074	7.42	2.014	0	10	8
Physical security	140471	1.92	.795	1	4	2
Other subjective well-being measures						
feel_happy	140515	6.616	2.111	0	10	7.5
Happiness Index (HI)	138918	6.992	1.755	0	10	7.5

Figure 5.1: The distribution of life satisfaction and normal density estimate



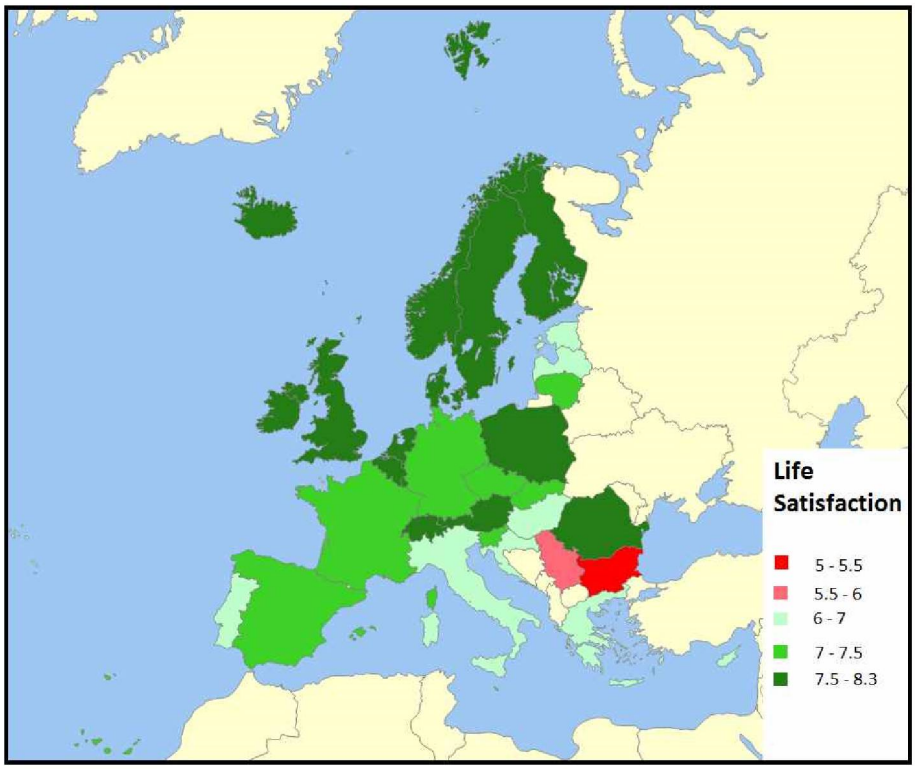
Source: The data comes from EU-SILC 2013 sample of 142,112 employees. Author's computations. *Notes:* Life satisfaction is the answer on question *Overall, how satisfied are you with your life nowadays?*; where 0 means Not at all satisfied, 10 means Completely satisfied.

the subjective well-being and certain type of self-worth, the pride in life's success. If this is true, then life satisfaction should be a bad measure of people's utility. The evaluation of feeling happy miss the self-worth part and still might express the subjective well-being that could be understood as utility from life. Therefore feeling happy is used as a robustness check of the subjective well-being measure.

Nevertheless, Angner (2013) argues that the subjective well-being is hard to measure using one single question and doing so can exaggerate the results. The single question usually points to an abstract issue like happiness or life satisfaction. And it is questionable, whether it is possible to formulate the question in a way that all respondents understand it equally. Further, the respondents might not consider all circumstances while filling the questionnaire and bias the results. Asking more specific questions might overcome this problem.

Therefore, the second robustness analysis uses a constructed Happiness Index (HI) as a measure of subjective well-being. Likewise Kahneman & Krueger (2006) recently constructed so called "*U–index*" representing the proportion of time with negative emotions; where the reports of emotions are obtained through Day reconstruction method. The Happiness Index can be understood as overall mood in the past four weeks. It is designed as the stated frequency in past four weeks of Being happy plus Feeling calm and peaceful less Feeling down in the dumps, Feeling down-

Figure 5.2: Average life satisfaction among employees



Source: Data about employees form EU-SILC 2013 weighted by the sample weights used for coloring of Europe map at `http://philarcher.org/diary/2013/euromap/`.

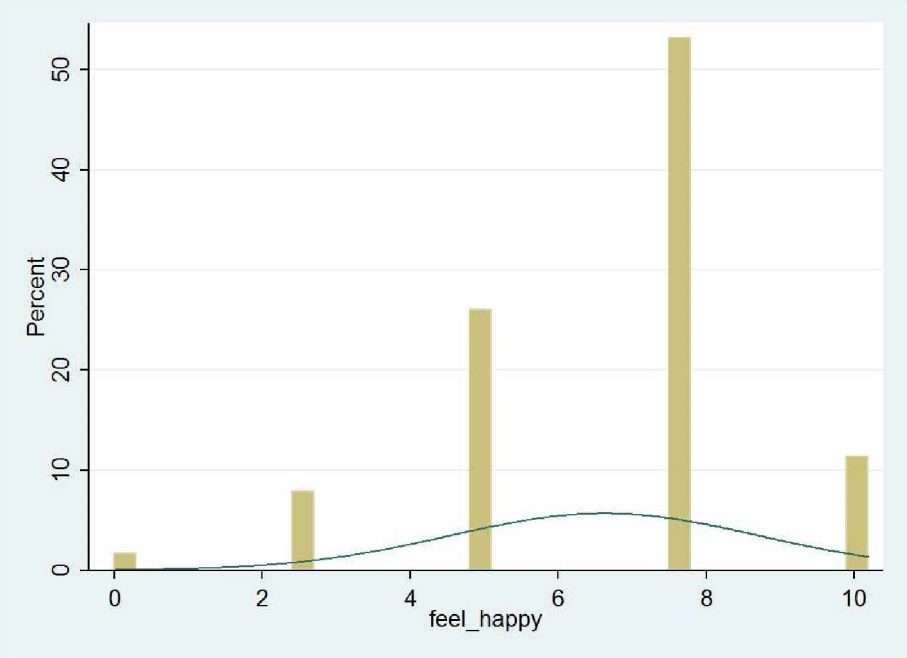
hearted or depressed, and Being very nervous. The mood answers are first rescaled in the same way as Being happy so the higher number corresponds to more frequent feeling. For the comparability with life satisfaction the HI is divided by five, and six is added for non-negativity. At the end the HI ranges from 0 to 10 as life satisfaction does; and 6 represents a balance between positive and negative feelings. The advantage of the Happiness Index lies in better comparability between respondents as the questions composing the HI focus on the frequency of feelings rather than valuation of abstract issues.

The *U-index* measures more precisely the true feelings, but only for one day. The Happiness Index express the overall mood in longer recent time period, and therefore might be more suitable as proxy of subjective well-being. Kahneman & Krueger (2006) say that the standard subjective well-being questions reflect rather perceptions of experiences than utility and in this way focus the research. They use also Net affect, a valuation of an activity designed as average of six negative feelings subtracted from average of three positive feelings. But again, the feelings are measured only during one day, and therefore represent rather actual emotions than overall mood. On the contrary, the Happiness Index bases on retrospective valuation of feelings that might not be affected by current emotions.

The HI could be understood as a retrospective version of Kahneman‘s Net affect and the Feel happy proxy might be treated as an inverse U-index measured only by one question. Both HI and Feel happy are summarized at the end of Table 5.2 and achieve similar means (6.992 and 6.616, respectively) and the same median value (7.5). Figure 5.3 shows the distribution of answers about the frequency of feeling happy and Figure 5.4 the same for Happiness Index.

All three applied subjective well-being indicators are highly positively correlated. Table 5.3 summarizes row correlations higher than 10% between HI, feel happy, life satisfaction, and the proposed drivers of subjective well-being. As feel happy and HI are from 70% positively correlated, their correlations with other variables are almost the same. Life satisfaction, however, differ. Life satisfaction is significantly more correlated with job characteristics and material prosperity than feel happy or HI (tertiary education level, income, ability to pay unexpected expanses, ability to pay one meal with meat every second day, and elementary type of work). The social indicator of having a friend and the health characteristic similarly correlate with all three subjective well-being measures. Kahneman & Krueger (2006) also finds higher correlations between income or education and life satisfaction than between them and the net affect.

Figure 5.3: The distribution of Feeling happy and normal density estimate



Source: The data comes from EU-SILC 2013 sample of 140,515 employees and are weighted by the sample weights. Graph by author.

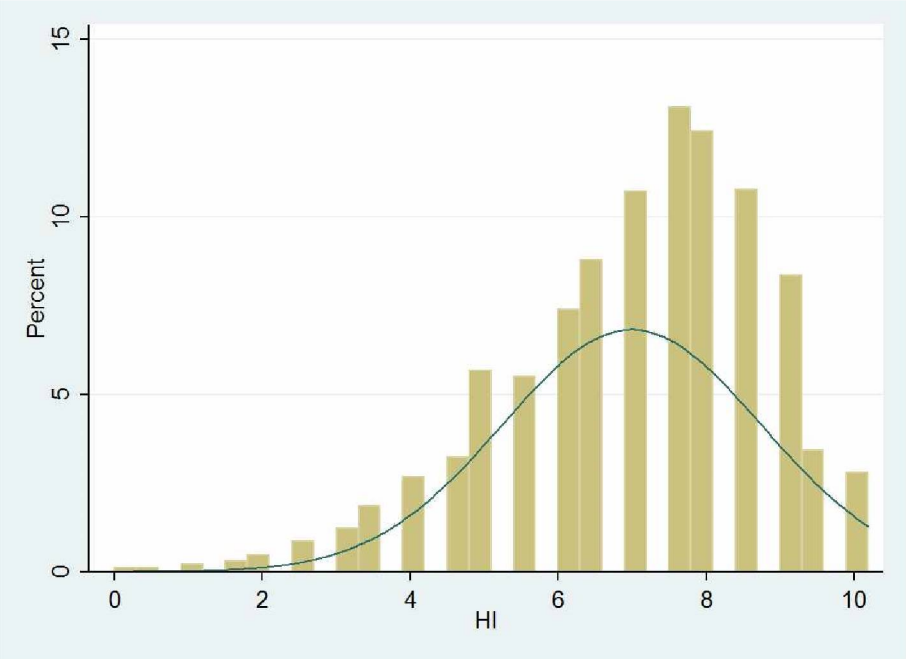
Notes: The frequency of feeling happy is coded as follows: 10-All of the time, 7.5-Most of the time, 5- Some of the time, 2.5-A little of time, 0-None of the time.

Table 5.3: Correlation table of subjective well-being indicators and their possible drivers

Variable	Life satisfaction	Feel happy	Happiness Index
Life satisfaction	1.000	0.451	0.482
Feel happy	0.451	1.000	0.706
Happiness Index	0.482	0.706	1.000
elementary_work	−0.101	−0.049	−0.079
payunexp	0.262	0.153	0.201
paymeat	0.194	0.127	0.135
female	−0.010	−0.035	−0.114
friend	0.178	0.180	0.185
health_limit	−0.149	−0.140	−0.196
tertiary	0.125	0.060	0.089
lg_income	0.113	0.065	0.055

Note:

Figure 5.4: The distribution of Happiness Index and normal density estimate



Source: The primary data about feelings comes from EU-SILC 2013 and are weighted by the sample weights. Graph by author's computations.

Notes: The Happiness index is constructed as a sum of feelings with specific frequency in past four weeks, where Being happy and Feeling calm and peaceful is assumed to be positive and Feeling down in the dumps, Feeling downhearted or depressed, and Being very nervous is assumed to be negative. The frequency is coded as follows: 10-All of the time, 7.5-Most of the time, 5- Some of the time, 2.5-A little of time, 0-None of the time.

5.1.3 Individual characteristics form EU-SILC 2013

The EU-SILC survey contains hundreds of household and individual socio-economic characteristics. For the analysis were used those, that could influence subjective well-being. Their characteristics are summarized in Table 5.4 and Table 5.5.

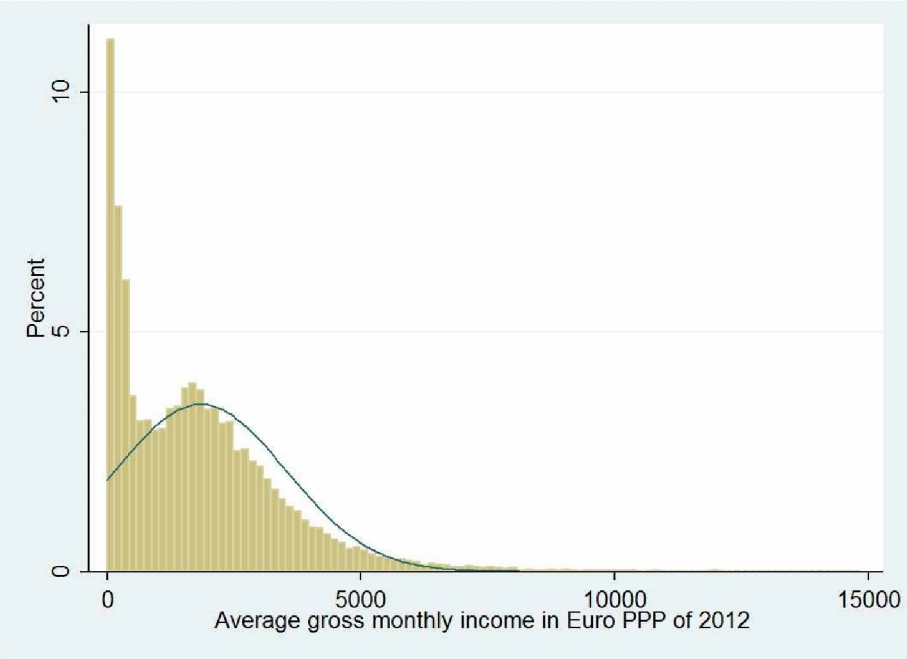
Several characteristics inform about the material prosperity of an individual. First of all the individual's yearly income. Since only 22 of 32 countries in the sample provide information about net income, gross income values that are reported by all countries are used instead. Gross income means before taxes and social contributions. That overvalues the level of net individual income but for all citizens of one country equally. The cause of possible bias of results are differences in tax burdens across sample countries.

The income data relates to a reference period of last 12 months, therefore the income variables provided in national currencies are converted via purchasing power parities (PPP) for actual individual consumption per Euro of 2012 obtained from (Eurostat 2017) in order to assure cross-country comparability. Afterwards, a natural logarithm of the gross income is taken.[3] For better understanding of the data, Table 5.4 reports also average gross monthly income *g_income_month* as 1/12 of the gross yearly income. The values of gross monthly income in the sample range from 0 to 162,650.5 Euro with mean monthly income of 1,872.143 Euro and with median of 1,564.806 Euro. The zero income (by 2,403 observations in total) by employed individuals might impress strange. There are two possible explanations. Fist, zero income might have individuals that report to be employed in the time of the questionnaire at the beginning of 2013, but were not employed in 2012. Second explanation provide voluntary unpaid jobs. As Figure 5.5 shows the distribution of gross monthly income below EUR 15,000 (for better display, Figure A.1 in Appendix shows the whole distribution) follows log-normal distribution common for the income distributions, but is disturbed with high frequency at the origin. The reason for such high share of observations at the origin might be low income of part-time employees. Therefore I analyze also a subset of only individuals with income above EUR 500. The results of the analysis on that subset yields similar results (these results are available upon request). Therefore, the inclusion of the low income individuals should not bias the results. On top of that, I apply also a quantile regression that explains the differences between the quantiles of the sample population.

To measure whether happiness depends on people's reference point, income is measured in relative terms as the difference between individual's gross yearly income and the median of regional gross yearly income, both in natural logarithms:

[3] To zero income values 0.0000000001 is added to obtain the natural logarithm. As the change is negligible, it should not bias the results.

Figure 5.5: The distribution of gross monthly income and normal density estimate



Source: Data about employees form EU-SILC 2013 weighted by the sample weights.

$$income_diff_{ijk} = ln(g_income_{ijk}) - ln(median(g_income_{jk})), \tag{5.1}$$

where i and j denote individual and country subscripts, and k denotes regional subscript. Regions in EU-SILC should be filled according to NUTS-1 level (Nomenclature of Units for Territorial Statistics) that corresponds to the largest possible distinction within one country (EUROSTAT 2013b). Nevertheless, the regional data are unbalanced. Germany, Netherlands, Portugal, Serbia, and Slovenia do not report the regions at all; and some countries that should have only one region according to NUTS-1 level like the Czech Republic report them on NUTS-3 level (that corresponds to the 13 administrative units). Romania reports four separate regions but the record is missing by 6 observations. These 6 observations are omitted from analyses where *income difference* is used. To sum up, only 14 countries from the sample report more than one region. For the remaining 18 countries the whole country is considered as one region for the computation of median regional income. Table A.1 in Appendix summarizes the specific number of regions by country. The aim was to measure the median income in as close neighborhood as possible to fit best the local relative position of the individual. The NUTS-3 level supports this aim, but the whole country regions change it a bit. Still the measure of *income difference* provides a relevant information about the relative income position within at least the country.

Table 5.4: EU-SILC 2013 Summary of data used for analysis

Variable	Obs	Mean	Std. Dev.	Min	Max	P50
lg_income	142112	9.235	1.935	0	14.484	9.84
income_diff	142112	-.255	1.468	-10.382	4.221	.001
g_income	142112	22465.72	23773.21	0	1951807	18777.67
g_income_month	142112	1872.143	1981.101	0	162650.5	1564.806
hour_worked	142112	38.255	10.042	4	90	40
age	142112	41.849	11.233	15	81	42
age_sq	142112	1877.551	949.021	225	6561	1764
gdp	31	104.488	25.163	37	259	107
gdp_grow	31	.033	1.579	-7.3	4.3	.2
gov_expend	31	1.024	.068	.78	1.171	1.054
Gini	31	29.978	2.546	22.5	36	30.5
unemploy	31	9.786	4.153	3.1	24.8	9.8
DI2012	31	7.957	.617	6.33	9.93	7.88
CPI2012	31	68.337	12.383	36	90	71
rainy_days	31	130.011	30.863	54	203	130
temp	31	10.836	2.315	2.005	19.906	11.748
sunny_days	31	158.14	55.239	55	335	173
sun_avg	31	11764.83	2050.602	7703.504	19492.6	12233

Note: The data comes from EU-SILC 2013, Eurostat, Agrgi4Cast, The economist Intelligence Unit 2012, and Transparency International database; contains only records of employees reporting their life satisfaction, and are weighted by the sample weights.

Table 5.4 summarizes two more variables from EU-SILC 2013, age, and number of hours worked per week. Age was calculated at time of the survey interview in March 2013 from provided years and months of birth (when only birth month was missing, is was assumed that the birth month was after March). Hours worked are sum of hours worked in the main and in other jobs per week. Hours worked per week are winsorized at 1th (170 obs. in total) and at 99th (166 obs. in total) deciles to correct possible mistakes in the data (maximum was 168, that means 24h all 7days in a week) and to weaken the influence of the outliers and the leverage points. Then, the hours worked per week range from 4 to 90 with mean at 38.255. As the change is small and affect only 2‰ of the analyzed observations, it should not bias the results.

Table 5.5 summarizes the dummy variables from EU-SILC used for the analysis and provides their short description. The first four identify a reason for working less than 30 hours per week – *underemployed* represent an individual that would like to work more, but cannot find job for more hours; *want_nmh* equals one if the individual does not want to work more; by *housework* the individual cares about children or other person. Together only 1.37% (19,442 obs.) of employees from the analyzed sample work less than 30 hours. The analyzed sample is gender balanced, contains 51% women and 49% men. Similarly, 55% of the sample individuals are married or have a registered partnership. Marriages cannot be distinguished from registered

partnerships, but both signal having a family, that might positively influence individual's happiness. The last dummy variable *curtain* represents 52,141 (37% of the sample) employees from 12 countries of the former iron curtain (post-communist countries).

Table 5.5: EU-SILC 2013 Summary dummy variables

Variable	Short description	Share	Std. Dev.
underemployed	Works < 30h - cannot find job	.034	.181
want_nmh	Works < 30h - he/she wants	.026	.158
housework	Works < 30h - housework, children	.038	.192
other_reason	Works < 30h - other reasons	.03	.169
elementary_work	Elementary Occupations – ISCO-08	.089	.285
payunexp	Household can pay unexpected expanses	.665	.472
paymeat	Household can pay meal with meat /2 days	.928	.258
bad_living	Accommodation problems, noise, pollution	.27	.444
crime	Crime & vandalism in the living area	.14	.347
married	Being married	.551	.497
female	1 – female, 0 – man	.508	.5
child	Having at least one child	.511	.5
female_child	Female with at least one child	.277	.447
widow	Being widowed	.02	.138
friend	Having anyone to discuss personal matters with	.944	.231
health_limit	Hawing strongly limiting health problems	.143	.351
primary	Primary or early childhood education	.031	.173
secondary	Lower, Upper, and Post secondary education	.570	.495
tertiary	Tertiary education	.353	.478
temp_job	1 – Temporary job, 0 – Permanent job	.128	.334
manager	Having supervisory managerial position	.255	.436
own_dwelling	Owner of dwelling or owner paying mortgage	.677	.467
curtain	1 for former communist countries	.205	.403

Notes: The data coming from EU-SILC 2013 of 142,112 employees that filled the well-being module and all individual characteristics summarized in Table 5.4 and this Table. Data are weighted by sample weights.

5.2 Basic country characteristics from Eurostat

To identify possible differences in happiness across the sample countries, model **??** controls for the country economic, social, and weather characteristics of the year 2012 because the EU-SILC questionnaire was done at the beginning of 2013. The economic indicators (GDP, GDP growth, governmental expenditures, Gini coefficient, and average unemployment) are obtained mainly from the public Eurostat database. Table 5.4 provides their statistics. Only the Gini coefficient of Serbia is obtained from a study about poverty in Serbia supported by Serbian government by Mijatovic (2014). The Gini coefficient from Eurostat measures the income inequality

of equalized disposable income in country; 100 represents maximal inequality and 0 perfect equality.

5.3 Other country characteristics

To test the hypothesis that corruption environment might decrease peoples happiness, the Corruption Perception Index (CPI) of the year 2012 is applied in the **??** model identifying the possible country drivers of happiness. CPI 2012 is obtained from public Transparency international database and ranges from 0 to 100, where 100 means no corruption and 0 maximal corruption. The lowest CPI in 2012 of 8 had, for example, Afganistan and Somalia, and the highest CPI of 90 had Denmark, Finland, and New Zealand. Similarly, individuals might be also influenced by the political regime of the country. The European countries from the EU-SILC sample have high corruptions indexes, but there are significant differences. The CPI 2012 ranges for the sample countries from 36 in Greece to 90 in Denmark with mean 66.66 and standard deviation 14.358.

Corruption might be also connected with the type of regime in the country. Besides, the regime as such could influence individuals happiness as such. For example, Frey & Stutzer (2000) finds the stated happiness level of Swiss is higher than by Switzerland‘s foreigners that cannot participate in the Swiss direct democracy. Therefore Democracy Index (DI) of the year 2012 from The economist intelligence unit (The economist Intelligence Unit 2012) is used for the analysis. The Economist Intelligence Unit‘s index provides robust measure of democracy as it includes 60 indicators from five categories expressing the democracy of the country (public elections, civil liberties, the functioning of government, political participation of the citizens, and political culture). The Democracy Index then ranges from 0 to 10, where 10 means full democracy and 0 an authoritarian regime. The DI 2012 ranges in the EU-SILC sample countries from 6.33 to 9.93 with mean at 7.99 and SD 0.67 (7% of the DI scale). Both Corruption Perception Index 2012 and Democracy Index 2012 are summarized in Table 5.4.

5.3.1 Weather data

Weather could have a substantial effect on people‘s moods. For example, Hsee & Tang (2007) uses the valuation of happiness from a sunny day after one week rain as comparison for actual feelings. Therefore the analysis of country effects accounts also for weather. Because EU-SILC provides only one point data that measure the overall subjective well-being, the weather proxies might cover only the long-lasting effect of weather. Table 5.4 summarizes the number of sunny and rainy days, average temperature and average solar radiation during the year 2012 across the sample

countries. Data about solar radiation in KJ/m2/day, mean air temperature in °C, and the sum of precipitation in mm/day are obtained from a Joint research centre by European Commission called Agri4Cast on a daily basis for the year 2012 and are public. Further, for each country the meteorological data comes from several comes from several meteorological stations. By average temperature and average solar radiation, arithmetical averages are taken first within each day in each country across all the meteorological stations. Then the yearly average is their arithmetical average.

Because the information about region of individual‘s household in the EU-SILC sample are incomplete, the rainy and sunny days are evaluated for the whole country. Therefore it is constructed to best fit the differences between countries rather than precise number of sunny or rainy days. The day is considered as sunny if its average solar radiation is above the average yearly solar radiation of all the sample countries. The number of rainy days is derived in the same way from precipitation. Within the sample countries the number of sunny days than ranges between 55 (Norway) and 335 (Malta), and the number of rainy days ranges from 54 (in Malta) to 203 (Norway).

Chapter 6

Results

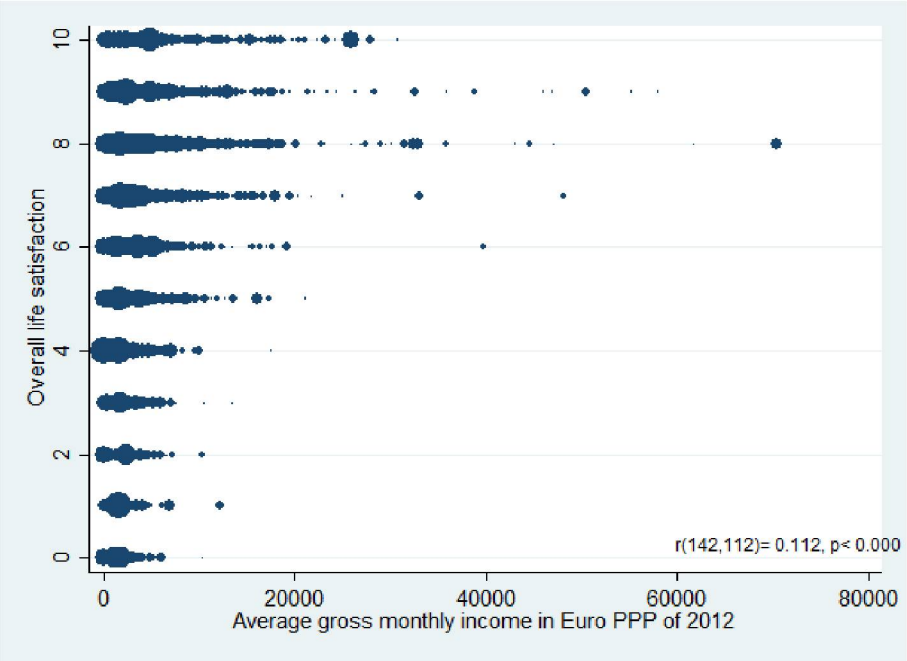
All applied models indicate positive relationship between material prosperity and subjective well-being. The OLS regression, ordered probit, and ordered logit confirm the findings. Quantile regression then shows higher sensitivity to material prosperity with low income. Besides the material prosperity and good social contacts seem to significantly increase subjective well-being. This chapter inspects the data first graphically and then proceeds to the econometric analysis described in Chapter 4.

6.1 Graphical representation of Happiness drivers

Figure 6.1 depicts the raw correlation between life satisfaction and average gross monthly income; it excludes one observation of EUR 162,650.5 income with weight 1,479.245 for better display of the raw correlation. In case of absence of the correlation between life satisfaction and income Figure 6.1 should look like regular grid. Observations are, however, concentrated at the origin, while lower right corner of the grid is empty. This figure indicates that low income people report quite evenly low and high life satisfaction levels whereas high income people tend to report more often high levels of life satisfaction. To sum up, it appears that low income is not related to low life satisfaction; poor people might be influenced by other factors, while gross monthly income over EUR 25,000 is reported by individuals with life satisfaction 7 and more. This is in accordance with other happiness literature findings. For example Stevenson & Wolfers (2008) based on GDP as income measure present higher subjective well-being in wealthier societies. Similarly Graham *et al.* (2004) on Russian panel data find that income affects happiness only above certain minimal level indicating that income is more important for happiness of wealthier people.

The raw correlation between the frequency of feeling happy during past four weeks and the average gross monthly income resembles the life satisfaction – income raw correlation. Figure 6.2 shows that people earning more than EUR 42,000 gross

Figure 6.1: Raw correlation between life satisfaction and average gross monthly income

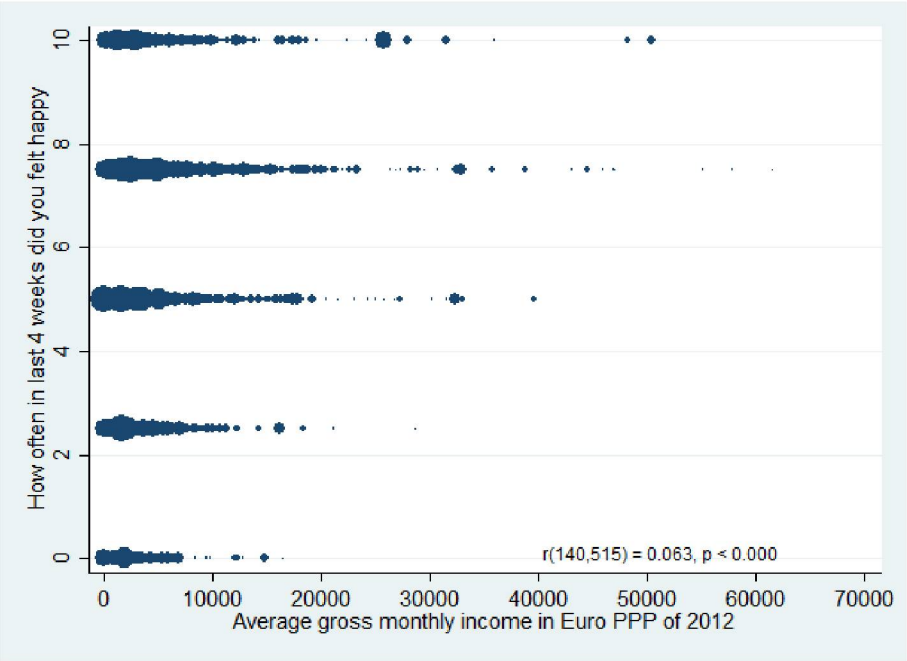


Source: The data comes from EU-SILC 2013 sample of 142,112 employees and are weighted by the sample weights. Graph by author.

Notes: Overall life satisfaction 0 means Not at all satisfied, 10 means Completely satisfied. One observation of EUR 162,650.5 per month gross income with life satisfaction of 9 was excluded for better display. The size of a dot representing one individual is 0.4 mm.

monthly income report being happy at least Most of the time. It may suggest that very high earnings bring the feeling of happiness.

Figure 6.2: Raw correlation between feeling happy and average gross monthly income



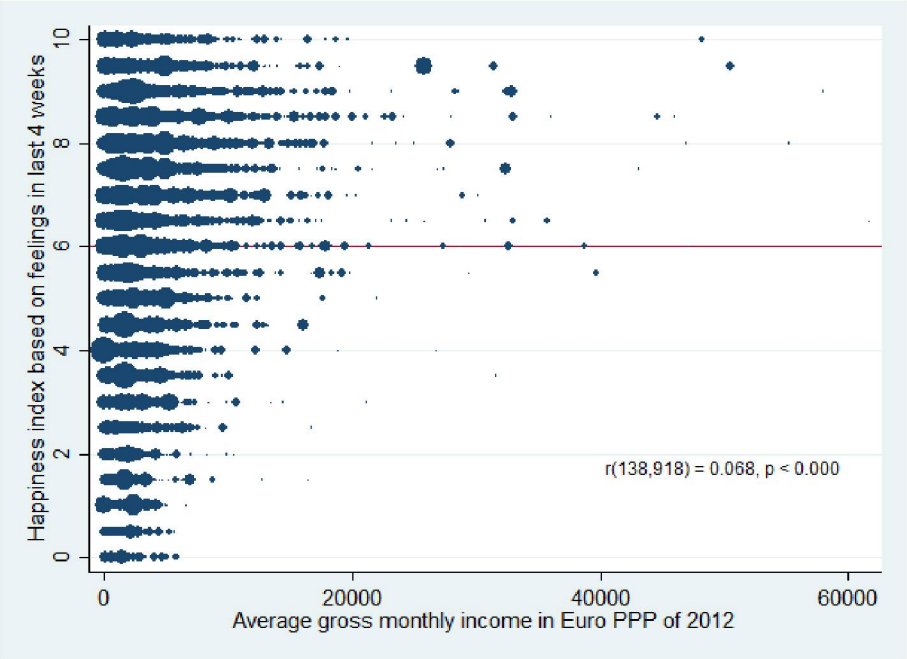
Source: The data comes from EU-SILC 2013 sample of 140,515 employees and are weighted by the sample weights. Graph by author.

Notes: The frequency of feeling happy is coded as follows: 10-All of the time, 7.5-Most of the time, 5- Some of the time, 2.5-A little of time, 0-None of the time. One observation of 162,650.5 Euro per month gross income with the frequency of feeling happy of 5 was excluded for better display. The size of a dot representing one individual is 0.4 mm.

The same raw correlation between money and happiness seems to be confirmed also by the frequency of positive and negative feelings – Happiness index (H-index). The H-index captures positive feelings: Being happy and Feeling calm, and negative feelings: Feeling down in the dumps, Feeling downhearted or depressed, and Being very nervous. H-index therefore corresponds to the overall mood of the person in past four weeks. It holds that the higher the H-index, the more positive feelings overrule the negative ones, since positive feelings are added to 6 and negative ones subtracted. Figure 6.3 presents the raw correlation between gross monthly income and H-index. For better clarity it depicts only earnings below EUR 20,000 but the trend continues further. The lower right corner is again empty indicating that rich people tend to have a positive mood.

As the sample contains more individuals with low income that report all levels of well-being while containing less individuals with high income report only high levels of well-being, income is only slightly correlated with the well-being indicators.

Figure 6.3: Relationship between feelings in last four weeks (H-index) and average gross monthly income



Source: The primary data about feelings comes from EU-SILC 2013 and are weighted by the sample weights. Graph by author's computations.

Notes: The Happiness index is constructed as a sum of feelings with specific frequency in past four weeks, where Being happy and Feeling calm and peaceful is assumed to be positive and Feeling down in the dumps, Feeling downhearted or depressed, and Being very nervous is assumed to be negative. The frequency is coded as follows: 10-All of the time, 7.5-Most of the time, 5- Some of the time, 2.5-A little of time, 0-None of the time. Answers do not know were excluded. For non-negativity 6 is added to the H-index; e.g. 6 represents a balance between positive & negative feelings and is depicted as a red line.

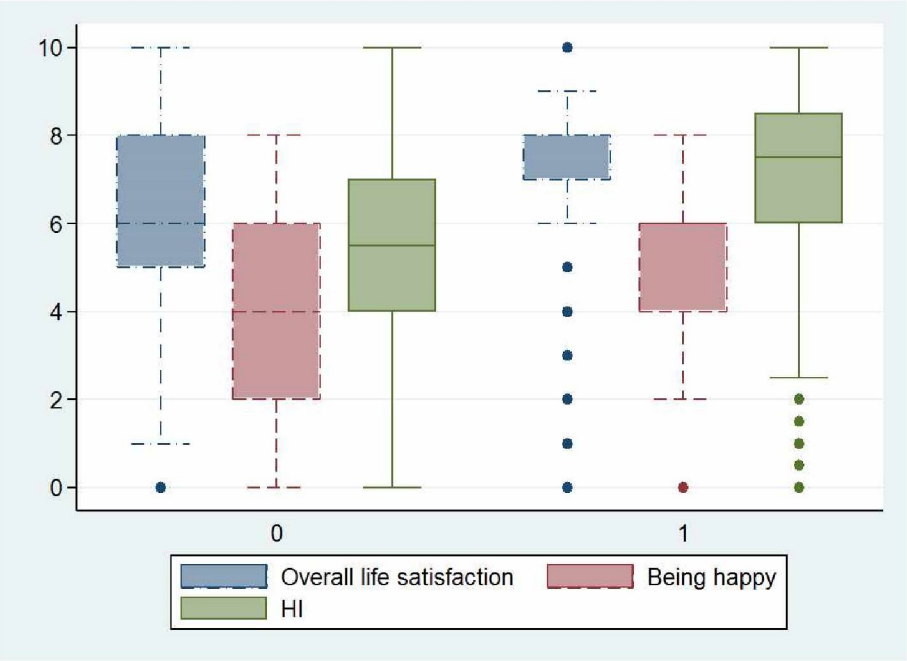
Only observations of gross monthly income below EUR 60,000 displayed for better clarity.

The correlation is strongest $r(142, 112) = 0.112$ but significant, with the overall life satisfaction judgment. There is, however, difference between low-earners and high-earners. The correlation is lower for individuals with under average income $r = 0.017$ (under median $r = 0.026$) and higher for individuals with above average income $r = 0.091$ (above median $r = 0.1086$). Median income (EUR 1134.414) is lower than mean income (EUR 1872.143), thus the correlation might not be linear in income.

Further, other important factors like age, family status, health, religion might influence the relationship money – happiness. Figure 6.4 depicts the box plots of well-being indicators‘ distribution over the groups that reported having or not having a friend. The question about friend refers rather to having anyone to discuss personal matters with. 94% of the sample answered positively to this question. This imbalance of the groups with and without a friend explains the higher variance in the smaller group of people having nobody for discussion of personal matters. Figure 6.4 shows that medians and means of all three well-being indicators (life satisfaction, feeling happy in last four weeks, and H-index) are lower in the group without a friend. Note, however, that the confidence intervals of Happiness Index and of Feeling happy overlap and therefore the two groups might not be statistically different in terms of subjective well-being.

The relationship between material prosperity (not only income) and well-being is complicated, also genetic might be important (Tov & Diener 2007). The positive correlations suspect that income might positively affect well-being at least for the high earners. For detection of influence of any kind of material prosperity on well-being further analysis is needed.

Figure 6.4: The correlation between having anyone to discuss personal matters with (friend) and well-being indicators



Source: The data comes from EU-SILC 2013 and are weighted by the sample weights. Graph by author.

Notes: 94% of respondents (after weighting) report having a friend, only 6% not. The Happiness index (HI) is constructed as sum of feelings with specific frequency in past four weeks, where Being happy and Feeling calm and peaceful is assumed to be positive and Feeling down in the dumps, Feeling downhearted or depressed, and Being very nervous is assumed to be negative. The frequency of feelings is coded as follows: 10-All of the time, 7.5-Most of the time, 5- Some of the time, 2.5-A little of time, 0-None of the time. For non-negativity 6 is added to the H-index; e.g. 6 represents a balance between positive & negative feelings. Life satisfaction 0 means Not at all satisfied, 10 means Completely satisfied.

6.2 Econometric analysis of life satisfaction drivers

This section describes the basic drivers of life satisfaction. First, it analyzes the relationship between happiness and material prosperity based on modes specified by Equation 4.1 and Equation 4.2. All applied models, summarized in Table 6.1, find positive relationship between material prosperity and life satisfaction statistically significant at least at 5% level. The interpretation of estimates in the ordered response models specified by Equation 4.6 is not simple. But statistical significance and sign of the ordered response models' estimates agree with the OLS regression results. Second, job characteristics are discussed with regard to life satisfaction. Next, individual country effects as specified in Equation 4.2 are compared. Lastly, the relationships are analyzed on various quantiles of the sample population as Equation 4.4 specifies.

6.2.1 Material prosperity

According to the OLS regression as specified in Equation 4.1 with robust standard errors clustered at country level, one percentage point income increase, ceteris paribus, rises life satisfaction by 0.059. It means a change of life satisfaction scaled form 0 to 10 by half percentage point or by 3% of the LS standard deviation (SD). More than ten times stronger effect has the ability to pay unexpected expanses from own resources *payunexp* that increases the life satisfaction by 0.601 and the ability to pay a meal with meat, chicken, fish, or vegetarian equivalent *paymeat* every second day by 0.724. It means a change of life satisfaction by 6 and 7 percentage points, respectively. These variables can be understood as financial security in terms of basic needs. Table 6.1 presents only the material prosperity estimates, full results are in Table B.1 in Appendix The financial security together with income constitute the material prosperity of individuals. Assuming 1% income increase the material prosperity improves the life satisfaction by 1.384. Material prosperity therefore accounts for approximately 14% of life satisfaction variance.

The effect of material prosperity on happiness may, however, differ across countries. Within the country people might be influenced by common social and culture environment; that is not observed in model of Equation 4.1 presented in Table 6.1. Table 6.3 therefore summarizes the results of model specified in Equation 4.2 containing dummy variables for all countries.

The bias caused by within-country correlation was not huge; still the material influence is weaker. The direct impact of income on life satisfaction practically does not changed and became statistically significant at 1% level. Both the coefficients of ability to pay unexpected expanses and of ability to pay meal with meat each second day decreased to 0.565 and 0.569, respectively. It still accounts for around 6 percentage points of the life satisfaction variance. Altogether, the material prosperity assuming 1% income increase improves life satisfaction by 1.184 accounting for 12

Table 6.1: The impact of material prosperity on life satisfaction

Response variable life satisfaction	OLS	OProbit	Ologit
lg_income	0.0586**	0.0327**	0.0563**
	(0.0226)	(0.0134)	(0.0248)
payunexp	0.601***	0.369***	0.666***
	(0.0453)	(0.0279)	(0.0500)
paymeat	0.724***	0.383***	0.697***
	(0.151)	(0.0781)	(0.145)
N	142,112	142,112	142,112
R^2	0.163		
pseudo R^2		0.043	0.044

Standard errors in parentheses clustered at country level.

Source: The data comes from EU-SILC 2013, contains only records of employees reporting their life satisfaction, and are weighted by the sample weights.

Notes: Only results of the material indicators from the model specified in Equation 4.1 are reported. Full results can be found in Table B.1 in Appendix. Standard errors in parentheses clustered at country-level. ***, **, and * denote statistical significance at the 1 %, 5 %, and 10 % level.

percentage points of the life satisfaction range. Therefore the hypothesis that people with higher material prosperity are happier can not be rejected.

Income effect check

Table 6.2 summarizes the results of material effect in restricted models specified according to Equation 4.2 but without the *payaunexp* and *paymeat* dummies to test whether the basic needs are part of the income effect on happiness or contain additional information. The income effect in the restricted OLS model equals 0.067, that is by 0.017 higher than in the full model presented in Table 6.3 (0.050). It indicates that part of the income effect is captured by the financial security proxies. The next two OLS models include only one of the financial security proxy to reveal how much income effect they independently capture. The income effect in the OLS model with only *payunexp* is predicted at 0.052 which is similar to the full OLS model, but differ from the restricted model by -0.016. The effect of *payunexp* is, however, by 0.069 higher than in the full model. It means that the part of the income effect is contained in the ability to pay unexpected expanses but *payunexp* contains also additional (psychical) effect on life satisfaction. On the contrary, the income effect in the OLS model with only *paymeat* is 0.062, that is similar to the estimate in the restricted OLS model. At the same time the *paymeat* impact on life satisfaction is by 0.207 higher than in the full OLS model presented in Table 6.3. It means that the effect of the ability to pay one meal with meat every second day is not a part of the income effect, and significantly increases life satisfaction.

To sum up, money brings more happiness because people can afford to buy more goods & services. Additionally, money assures certain level of peace of mind, that increases happiness. This interpretation corresponds to the evidence from the graphical inspection of the data in Figure 6.1. High income brings high levels of happiness but low income does not necessary yield low levels of happiness.

Table 6.2: The effect of material prosperity in detail

Response variable Life satisfaction	OLS - restricted	OLS-payunexp	OLS-paymeat
lg_income	0.0671***	0.0515***	0.0624***
	(0.00713)	(0.00716)	(0.00684)
hour_worked	−0.00340***	−0.00336***	−0.00340***
	(0.00113)	(0.000896)	(0.00108)
payunexp		0.634***	
		(0.0343)	
paymeat			0.776***
			(0.0623)
_cons	8.674***	8.428***	8.000***
	(0.191)	(0.210)	(0.178)
N	142,112	142,112	142,112
R^2	0.172	0.195	0.184

Source: The data comes from EU-SILC 2013, contains only records of employees reporting their life satisfaction, and are weighted by the sample weights.

Notes: Only results of the material indicators from the model specified in Equation 4.2 are reported. Full results can be found in Table B.2 in Appendix. Standard errors in parentheses clustered at country-level. ***, **, and * denote statistical significance at the 1 %, 5 %, and 10 % level.

6.2.2 Working factors

Income is connected with work; and work time and type influence life satisfaction. In Table 6.3 the OLS estimate of number of hours worked per week *hour_worked* is very low -0.003; but the standard deviation is 10 hours. Working for 10 hours per week more decreases, ceteris paribus, life satisfaction by 0.03. Expressed in relative terms, people are willing to work 15 more hours per week when compensated by more than 1% rise of their gross income. This relationship between income and hours worked per week does not hold for individuals that for some reason work less than 30 hours per week. Table 6.3 presents also the effects of the reasons; they might reflect psychical state of the individuals caused by the job satisfaction. Being *underemployed*, meaning that the person would like to work more but cannot find a job, weakens the positive income effect. Being *underemployed* decreases the life satisfaction, other thing equal (including the number of hours worked per week), by 0.351. The opposite effect has the voluntary decision to work less than 30 hours per week, *want_nmh*, that

increases the life satisfaction by 0.279. More satisfied with life are also people, that spend the rest of their work-time with family; the OLS model estimates the impact of *housework*, looking after children or other persons, as 0.173 growth of life satisfaction. *Other_reason*s including also disability to work more for personal illness or for undergoing education or training, do not have significant impact on life satisfaction. Except *other_reason*, all mentioned estimates are statistically significant at 1% level. The suspicion, that job matters for life satisfaction, is supported also by the negative estimate of -0.089 of having an *elementary_work*, that includes various cleaners and helpers occupations. On the contrary a supervisory *manager*ial position increases life satisfaction by 0.147. Further, having only a temporary job *temp_job* decreases the life satisfaction by 0.179. Again, all three factors are statistically significant at 1% level. 13% of the employed respondents, that filled the well-being module, work less than 30 hours per week. The type and duration of the work has significant effect on their life satisfaction.

Life satisfaction is a complicated phenomenon that is influenced by multiple factors as the happiness literature denotes (see for example Wang & Wong (2014); Huppert & So (2013); Diener *et al.* (2006); Frey & Stutzer (2002); Veenhoven (2000)). The OLS model in Table 6.3 identifies personal characteristics that affect life satisfaction. Married[1] people are on average by 0.349 more satisfied with their life and vice versa, people who lost their partner, the *widow*ed, are on average by 0.255 less satisfied compared to people living separately from other reasons (never married, separated, divorced); the estimates are statistically significant at 1% level. Females seem to be slightly more satisfied with their lives than men only without having children, since the estimate of *female* dummy equals 0.073, of having *child* dummy equals 0.026 but is statistically insignificant, and of their interaction *female_child* -0.066; statistically significant at least at 10% level. Female with at least one child is less satisfied with her life than the female without children by 0.041. The difference between men with and without a child is even more negligible, only 0.026 and statistically insignificant. The gender difference in life satisfaction when having children is almost negligible 0.032 in favor of women. Larger negative effect on life satisfaction of -0.551 significant at 1% level has a *health_limit* that strongly limits the individual in general activities. That is not surprising; positive relationship between happiness and health have found also Stevenson & Wolfers (2008); Diener & Seligman (2004) or Helliwell (2003). The literature is also consistent with the OLS model prediction that education is positively related to happiness. The model predicts that people with attained short cycle tertiary, Bachelor degree or equivalent *tertiary* education have by 0.148 higher life satisfaction with statistical significance at 1% level, than people with secondary and post-secondary education. Having only primary or lower

[1]Same-sex partnership is also considered as marriage if it is within the legal framework for registering partnership.

education decreases life satisfaction by 0.121, but the estimate is not statistically significant at 10% level.

Statistically significant impact at 1% level, has the age of the individual indicating that for example 40 years old person is by 0.295 less satisfied with life than 30 years old person. Older people are less satisfied, but the relationship is concave as age^2 is positive, although very low. Each additional year brings lower life satisfaction with minimum at 51.5 years old. People are influenced by the environment they live in. Living in an area suffering from crime, violence or vandalism, *crime*, decreases life satisfaction by 0.335. *Bad_living* representing any problems with dwelling (dark flat, pollution, noise area, leaking roof, damp walls/foundation, rot in window frames or floor) lowers life satisfaction by 0.205. Further, individuals *own*ing their dwellings are on average by 0.144 more satisfied with their lives. All the three environmental variables are significant at 1% level. Lastly, the most important factor augmenting life satisfaction by 0.973 at 1% significance level, is having a *friend*. The *friend* is defined as anyone to discuss personal matters with. Having such fried is almost as important as the impact of material prosperity; having a friend accounts for nearly 10 percentage points of the life satisfaction variance. Life satisfaction is determined by many aspects of peoples lives like marriage, gender, children, education and living environment; but the most important seems to be the social contact or base and the material prosperity.

Table 6.3: Material prosperity & life satisfaction with country fixed-effect

Response variable life satisfaction	OLS	OProbit	Ologit
lg_income	0.0497***	0.0291***	0.0528***
	(0.00714)	(0.00429)	(0.00751)
hour_worked	−0.00336***	−0.00213***	−0.00390***
	(0.000890)	(0.000561)	(0.000942)
underemployed	−0.351***	−0.202***	−0.368***
	(0.0384)	(0.0255)	(0.0414)
want_nmh	0.279***	0.185***	0.325***
	(0.0309)	(0.0194)	(0.0363)
housework	0.173***	0.125***	0.225***
	(0.0284)	(0.0190)	(0.0339)
other_reason	−0.0278	−0.0113	−0.00388
	(0.0268)	(0.0155)	(0.0306)

Response variable life satisfaction	OLS	OProbit	Ologit
elementary_work	−0.0889**	−0.0466***	−0.0914***
	(0.0327)	(0.0180)	(0.0348)
payunexp	0.565***	0.355***	0.642***
	(0.0344)	(0.0207)	(0.0371)
paymeat	0.569***	0.301***	0.554***
	(0.0645)	(0.0394)	(0.0759)
bad_living	−0.205***	−0.140***	−0.248***
	(0.0370)	(0.0248)	(0.0409)
crime	−0.335***	−0.212***	−0.362***
	(0.0243)	(0.0157)	(0.0271)
age	−0.0924***	−0.0609***	−0.106***
	(0.00568)	(0.00410)	(0.00883)
age_sq	0.000898***	0.000595***	0.00103***
	(0.0000647)	(0.0000450)	(0.0000937)
married	0.349***	0.240***	0.416***
	(0.0144)	(0.00693)	(0.0112)
female	0.0727**	0.0511***	0.0895***
	(0.0285)	(0.0189)	(0.0335)
child	0.0256	0.0130	0.0220
	(0.0191)	(0.0136)	(0.0220)
female_child	−0.0661*	−0.0404*	−0.0695*
	(0.0385)	(0.0238)	(0.0387)
widow	−0.255***	−0.142***	−0.278***
	(0.0396)	(0.0232)	(0.0430)
friend	0.973***	0.557***	0.999***
	(0.132)	(0.0774)	(0.141)
health_limit	−0.551***	−0.345***	−0.609***
	(0.0604)	(0.0371)	(0.0637)
primary	−0.121	−0.0479	−0.100
	(0.0778)	(0.0394)	(0.0703)
tertiary	0.148***	0.0915***	0.171***
	(0.0270)	(0.0191)	(0.0323)

Response variable life satisfaction	OLS	OProbit	Ologit
temp_job	−0.179***	−0.109***	−0.192***
	(0.0172)	(0.0113)	(0.0193)
manager	0.147***	0.0992***	0.177***
	(0.0205)	(0.0122)	(0.0195)
own	0.144***	0.0979***	0.184***
	(0.0313)	(0.0180)	(0.0321)
Austria	−0.271***	0.386***	0.700***
	(0.0374)	(0.00976)	(0.0212)
Belgium	−0.542***	0.125***	0.230***
	(0.0418)	(0.00430)	(0.00661)
Bulgaria	−2.380***	−0.917***	−1.705***
	(0.0281)	(0.0171)	(0.0438)
Switzerland	−0.285***	0.358***	0.623***
	(0.0412)	(0.00670)	(0.0151)
Cyprus	−1.665***	−0.516***	−0.882***
	(0.0416)	(0.0120)	(0.0269)
Czech Rep.	−0.798***	−0.0185	−0.0225
	(0.0116)	(0.0206)	(0.0367)
Germany	−0.676***	0.0733***	0.173***
	(0.0379)	(0.00576)	(0.00960)
Denmark	0.0441	0.595***	1.078***
	(0.0271)	(0.0154)	(0.0318)
Estonia	−1.358***	−0.381***	−0.693***
	(0.0333)	(0.0107)	(0.0237)
Greece	−1.310***	−0.321***	−0.547***
	(0.0387)	(0.0122)	(0.0217)
Spain	−0.848***	−0.0555***	−0.112***
	(0.0413)	(0.00649)	(0.0142)
Finland	0.0341	0.555***	0.996***
	(0.0427)	(0.00946)	(0.0225)
France	−0.806***	−0.0444***	−0.0807***
	(0.0436)	(0.00558)	(0.0108)
Croatia	−1.064***	−0.160***	−0.241***
	(0.0218)	(0.0155)	(0.0282)
Hungary	−0.985***	−0.142***	−0.238***
	(0.0207)	(0.0296)	(0.0536)

Response variable life satisfaction	OLS	OProbit	Ologit
Ireland	−0.578***	0.149***	0.287***
	(0.0514)	(0.00826)	(0.0162)
Iceland	*Omitted*	0.546***	0.973***
		(0.0285)	(0.0509)
Italy	−1.021***	−0.167***	−0.302***
	(0.0379)	(0.0101)	(0.0203)
Lihuania	−0.977***	−0.112***	−0.150***
	(0.0312)	(0.00823)	(0.0149)
Luxembourg	−0.675***	0.0718***	0.138***
	(0.0474)	(0.00868)	(0.0145)
Latvia	−0.954***	−0.134***	−0.229***
	(0.0335)	(0.0108)	(0.0225)
Malta	−0.966***	−0.107***	−0.182***
	(0.0354)	(0.00838)	(0.0138)
Netherlands	−0.387***	0.246***	0.447***
	(0.0465)	(0.00369)	(0.00851)
Norway	−0.454***	0.235***	0.414***
	(0.0236)	(0.0147)	(0.0264)
Poland	−0.432***	0.245***	0.468***
	(0.0248)	(0.0144)	(0.0261)
Portugal	−1.377***	−0.349***	−0.638***
	(0.0453)	(0.0182)	(0.0357)
Romania	−0.434***	0.201***	0.409***
	(0.0215)	(0.0177)	(0.0303)
Serbia	−2.169***	−0.798***	−1.457***
	(0.0157)	(0.0264)	(0.0572)
Sweden	−0.283***	0.344***	0.608***
	(0.0222)	(0.0157)	(0.0285)
Slovenia	−0.762***	0.0178***	0.0333***
	(0.0430)	(0.00503)	(0.00830)
Slovakia	−0.861***	−0.0218*	−0.0155
	(0.0296)	(0.0117)	(0.0201)
United Kingdom	−0.808***	*Omitted*	*Omitted*
	(0.0417)		
_cons	7.961***		
	(0.195)		

Response variable life satisfaction	OLS	OProbit	Ologit
N	142,112	142,112	142,112
R^2	0.201		
pseudo R^2		0.054	0.056

Source: The data comes from EU-SILC 2013, contains only records of employees reporting their life satisfaction, and are weighted by the sample weights.

Notes: Standard errors in parentheses clustered at country-level. ***, **, and * denote statistical significance at the 1 %, 5 %, and 10 % level.

6.2.3 Country effects

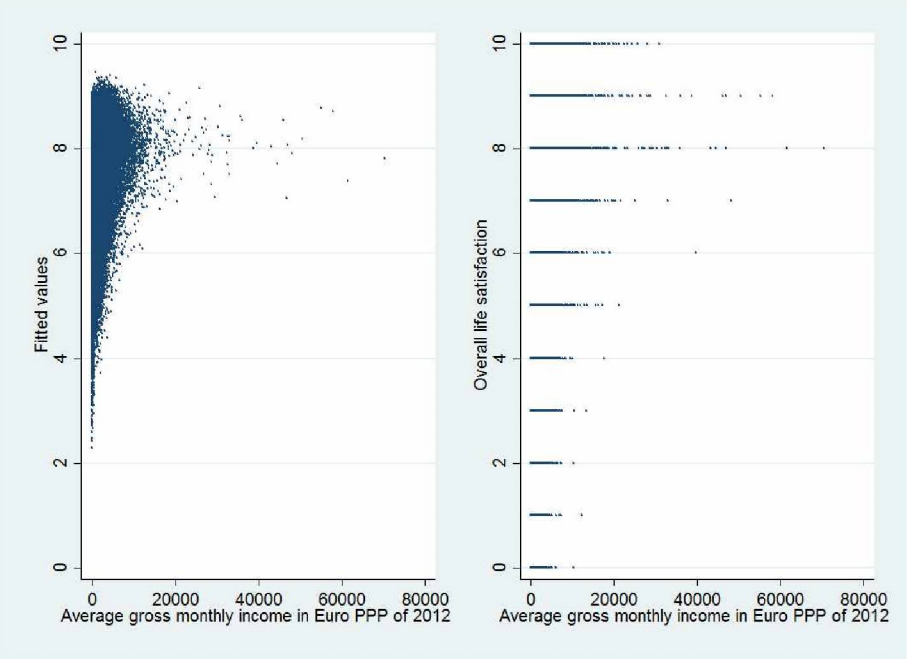
Looking at the country effects in the OLS regression in Table 6.3, where baseline is Iceland, the worst position has Bulgaria. In Bulgaria people with the same socio-economic characteristics are on average by 2.382 less satisfied with their lives than in Iceland. To the least satisfied countries belong also Serbia (-2.224), Cyprus (-1.666), Portugal (-1.403), Greece (-1.343), and Estonia (-1.336). On the contrary, people in Finland (0.031), and in Denmark (0.026) have on average higher life satisfaction than in Iceland. Life satisfaction in the Czech Republic is lower than in Iceland on average by 0.839, similarly like in Spain (-0.880), Slovakia (-0.870) Slovenia (-0.828), France (-0.823), United Kingdom (-0.790), Luxembourg (-0.703), and Germany (-0.688). Several countries have average life satisfaction between the level of Germany and of Iceland – Switzerland (-0.268), Austria (-0.273), Sweden (-0.293), Netherlands (-0.400), Poland (-0.453), Norway (-0.455), Romania (-0.472), Belgium (-0.557), and Ireland (-0.579). The results agrees with the previous findings indicating, that north European countries are on average happier than the rest of the Europe, but add also Austria and Switzerland. The ordered response models confirm the signs and significance of the country effect‘s OLS estimates, given the baseline country is the United Kingdom.

6.2.4 The model fit

Figure 6.5 depicts the fitted values of the life satisfaction predicted by the OLS model presented in Table 6.3 against average gross monthly income, that is below EUR 80,000, in PPP of 2012 on the left side, and true values of life satisfaction on the right side. The observations are not weighted by the population weights because for the visual test of the model fit it is not necessary. The fitted values are continues as the OLS regression does assume a continuous variable and follows similar distribution as the true values of life satisfaction. The OLS model is, however, unable to predict the tails. Figure 6.5 depicts no fitted values of 0-2, and of 10, although these values are present in the sample. The OLS model explains about 20% of the life satisfaction

variance, it could be caused by high inflation factor of the country dummies. The McFadden's pseudo R^2 for the corresponding ordered probit and ordered logit models equals only about 5%. Such low explanation power is by the models using individual responses, however, common (Helliwell 2003).

Figure 6.5: The OLS model fit



Source: The data comes from EU-SILC 2013 sample of 142,112 employees. Graph by author.
Notes: Life satisfaction is the answer on question *Overall, how satisfied are you with your life nowadays?*; where 0 means Not at all satisfied, 10 means Completely satisfied. Only observations with lower than EUR 80,000 per month gross income are displayed. The size of a dot representing one individual is 0.4 mm.

6.2.5 Happiness across various percentiles of population

The poor model fit of OLS could be explained if the happiness drivers do not have the same impact for the whole population, then the estimate of average will be imprecise for the border values of life satisfaction. The distribution of life satisfaction is highly skewed to the right and the effects on particular percentiles might be interesting. Table 6.4[2] presents the estimates of quantile regression indicating the maximal impact of the regarded drivers in the 10th quantile. The influence of the drivers weakens in higher percentiles of the population. Figure 6.6 depicts the quantiles regressions' fits on the left side and the true values of life satisfaction on the right side. The colors go from the 10th quantile at the bottom of the figure to the 90th quantile at top. The fitted life satisfaction values of the 10th quantile, and the 25th quantile follow a

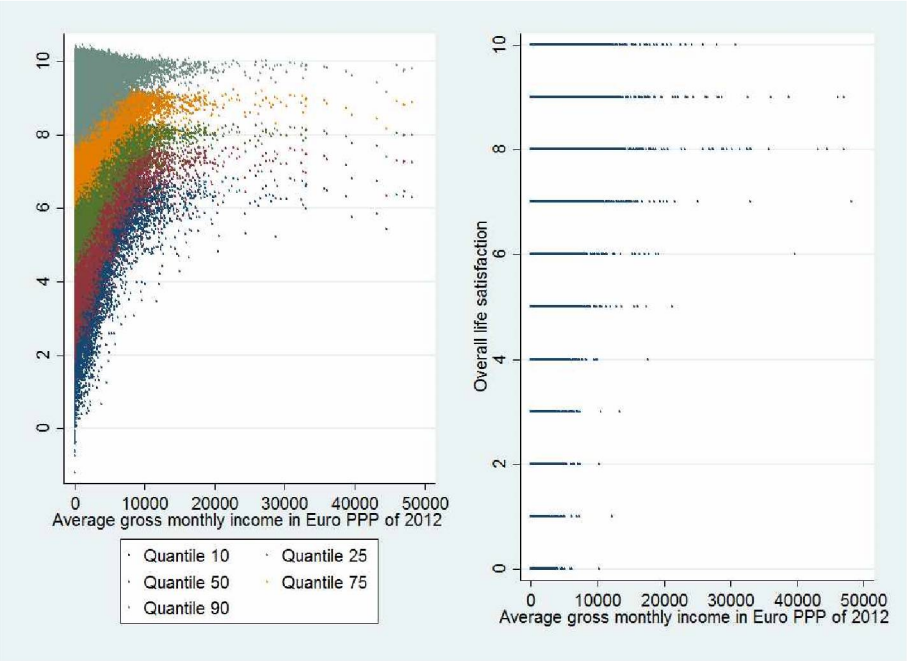
[2]Table 6.4 does not report the estimates of country effects; they can be found in Table B.3 in the Appendix.

concave shape and steeply rise up to the monthly income of EUR 15,000. For these first two lowest quantiles, the variance of the estimated LS at the origin is much higher (around 5 levels) than by the remaining quantiles (around 3 levels). This might indicate, that the rich people tend to report high levels of happiness as also have found. The fitted values of the 75th, and the 90th quantiles look like a right lighted down funnel which indicates, that the relationship between life satisfaction and income fro the 90th quantile of the sample population is unclear up to the EUR 15,000 level of income. Then it tend to be flat on the highest level. Therefore, the hypothesis, that the relationship between material prosperity and happiness is non-linear, cannot be rejected at least for the lowest quantiles of the sample population.

The signs of the estimates in Table 6.4 are almost for every variable at all quantiles same as the OLS model predicts; their magnitude however differ. This is also the case of material prosperity. The income effect weakens more than the remaining two material prosperity indicators. Income effect at 10th quantile is 0.119 statistically significant at 1% level and at 90th quantile it is 0.011 statistically insignificant. The estimates of the material prosperity indicators also start at higher level than the OLS predicts, at the 10th quantile *payunexp* is 0.921 and *paymeat* is 0.865. At the 90th quantile the estimates are not so much lower than the OLS prediction 0.231 and 0.343, respectively. The *payunexp* and *paymeat* ability estimates are, however, for all quantiles of the population statistically significant at 1% level. While income influences more the life satisfaction of lower income people with lower levels of life satisfaction, the material prosperity as such influence the life satisfaction irrespective of the income and initial level of life satisfaction.

Despite the skewed distribution of life satisfaction, the slope estimates at 50th quantile are similar to the OLS. The fitted values of the quantile regression better fit the true distribution of life satisfaction a the extereme values than the OLS fit depicted at Figure 6.5. For the middle values quantile and OLS estimates are similar.

Figure 6.6: The Quantile regression model fit



Source: The data comes from EU-SILC 2013 sample of 142,112 employees. Graph by author.
Notes: Life satisfaction is the answer on question *Overall, how satisfied are you with your life nowadays?*; where 0 means Not at all satisfied, 10 means Completely satisfied. Only observations with lower than EUR 50,000 per month gross income are displayed. The size of a dot representing one individual is 0.4 mm.

Table 6.4: The impact of material prosperity on happiness: quantile regression

Life satisfaction	Q10	Q25	Q50	Q75	Q90
lg_income	0.119***	0.0804***	0.0397***	0.0213**	0.0111
	(0.00968)	(0.00957)	(0.00683)	(0.00834)	(0.00819)
hour_worked	−0.00666***	−0.00428***	−0.00283***	−0.00263**	−0.00108
	(0.00181)	(0.00144)	(0.000886)	(0.00112)	(0.000842)
underemployed	−0.603***	−0.424***	−0.332***	−0.209***	−0.176***
	(0.116)	(0.0571)	(0.0601)	(0.0500)	(0.0304)
want_nmh	0.333***	0.311***	0.167***	0.240***	0.150***
	(0.120)	(0.0730)	(0.0500)	(0.0540)	(0.0273)
housework	0.143	0.239***	0.145***	0.128***	0.132***
	(0.0986)	(0.0524)	(0.0436)	(0.0396)	(0.0445)
other_reason	−0.0324	−0.0520	0.0151	0.0253	−0.0518
	(0.0789)	(0.0514)	(0.0472)	(0.0439)	(0.0365)
elementary_work	−0.189***	−0.102***	−0.101***	−0.0383	−0.0268
	(0.0592)	(0.0353)	(0.0209)	(0.0324)	(0.0250)
payunexp	0.921***	0.786***	0.528***	0.386***	0.231***
	(0.0294)	(0.0256)	(0.0186)	(0.0191)	(0.0138)
paymeat	0.865***	0.638***	0.550***	0.364***	0.343***
	(0.0797)	(0.0429)	(0.0338)	(0.0427)	(0.0268)

Life satisfaction	Q10	Q25	Q50	Q75	Q90
bad_living	−0.287***	−0.253***	−0.128***	−0.182***	−0.199***
	(0.0286)	(0.0203)	(0.0132)	(0.0176)	(0.0123)
crime	−0.507***	−0.389***	−0.189***	−0.269***	−0.238***
	(0.0409)	(0.0328)	(0.0189)	(0.0279)	(0.0153)
age	−0.111***	−0.0897***	−0.0672***	−0.0811***	−0.0769***
	(0.00873)	(0.00637)	(0.00442)	(0.00520)	(0.00368)
age_sq	0.00103***	0.000855***	0.000656***	0.000813***	0.000787***
	(0.000105)	(0.0000739)	(0.0000502)	(0.0000608)	(0.0000431)
married	0.376***	0.347***	0.259***	0.332***	0.328***
	(0.0322)	(0.0223)	(0.0141)	(0.0190)	(0.0140)
female	0.0700*	0.0542**	0.0688***	0.0717***	0.0472***
	(0.0372)	(0.0255)	(0.0175)	(0.0218)	(0.0152)
child	0.0673	0.0311	0.00822	−0.0107	−0.0100
	(0.0437)	(0.0290)	(0.0170)	(0.0245)	(0.0188)
female_child	−0.0773	−0.0466	−0.0423*	−0.0406	−0.0285
	(0.0516)	(0.0364)	(0.0229)	(0.0306)	(0.0226)
widow	−0.405**	−0.338***	−0.324***	−0.236***	−0.00370
	(0.165)	(0.0718)	(0.0460)	(0.0651)	(0.0464)
friend	1.517***	1.188***	0.954***	0.625***	0.595***
	(0.106)	(0.0594)	(0.0427)	(0.0519)	(0.0173)
health_limit	−0.827***	−0.685***	−0.446***	−0.411***	−0.352***
	(0.0462)	(0.0329)	(0.0271)	(0.0219)	(0.0134)

Life satisfaction	Q10	Q25	Q50	Q75	Q90
primary	−0.151	−0.194***	−0.139***	−0.0000609	0.126
	(0.108)	(0.0604)	(0.0445)	(0.0659)	(0.144)
tertiary	0.281***	0.207***	0.106***	0.0755***	−0.0501***
	(0.0281)	(0.0194)	(0.0121)	(0.0163)	(0.0120)
temp_job	−0.325***	−0.176***	−0.152***	−0.118***	−0.0819***
	(0.0406)	(0.0321)	(0.0238)	(0.0240)	(0.0151)
manager	0.203***	0.183***	0.111***	0.110***	0.0649***
	(0.0328)	(0.0211)	(0.0128)	(0.0171)	(0.0137)
own	0.146***	0.182***	0.125***	0.133***	0.0828***
	(0.0320)	(0.0220)	(0.0151)	(0.0192)	(0.0130)
_cons	4.041***	5.497***	6.868***	8.860***	10.07***
	(0.235)	(0.172)	(0.122)	(0.143)	(0.110)
N	142,112	142,112	142,112	142,112	142,112
pseudo R^2	0.145	0.162	0.088	0.076	0.055

Source: The data comes from EU-SILC 2013, contains only records of employees reporting their life satisfaction, and are weighted by the sample weights.

Notes: Standard errors in parentheses clustered at country-level. ***, **, and * denote statistical significance at the 1 %, 5 %, and 10 % level.

6.3 Additional findings about happiness

This section extends the model specified by Equation 4.2 to identify several other factors that might influence subjective well-being expressed as life satisfaction. First, the concave relationship of age and life satisfaction is described. Second, the relationship between happiness and material prosperity is analyzed on each age cohort separately. Both, trough OLS and quantile regression (Equation 4.4). Third, the effects of income inequality and of living in post-communist countries are presented (Equations 4.2 and 4.3). Further, happiness drivers within the countries are identified according to the model specified by Equation 4.5.

6.3.1 Age

Life satisfaction develops throughout the life as results in Table 6.3 indicate. The change of one year might not be as essential as the change in the life‘s stadium. For example ending the student life and becoming an employee, grounding a family, or getting a grandchild. The life‘s stadiums are not linked to the specific age but to a specific age cohort. Table 6.5 shows that the relationship between life satisfaction and age is concave and skewed to the youth. The least life satisfaction occurs with age between 48 and 58 years with 1% statistical significance, it is lower than for people older than 70 by 0.687. That is, by 7% of the life satisfaction‘s variance, or another said by 39% of the life satisfaction‘s standard deviation. The most satisfied age cohort is the youngest, between 15 and 25 years, their life satisfaction is by 0.042 higher than the life satisfaction of people older 70, but the difference is statistically insignificant.

6.3.2 Material prosperity across age cohorts and population quantiles

Table 6.6 presents the results of material prosperity and of having friend effects from OLS (second column) and quantile (3th - 7th column) regressions across six age cohorts. First column refers to the age cohort on that the regression was done and the last column displays the number of employees in that age cohort. The table is divided into four parts according to the explanatory variables.[3] Note, that the quantile regression estimates provide the upper bound of the suggested relationship magnitude.

The first part of the Table 6.6 focuses on income effect indicating no significant income effect in the fist and last age cohort, age 15-25 and over 70 years age. This might be because the income data does not include pensions, and pocket money, that young people still might get from parents. The average income in these groups is

[3]Results of the full OLS and quantile regressions across age cohorts presents Tables ??, ??, ??, ??, ??, and ?? in Appendix.

Table 6.5: The effect of age on life satisfaction

Response variable life satisfaction	OLS	OProbit	Ologit
age15_25	0.0420	−0.0127	0.00195
	(0.0986)	(0.0789)	(0.155)
age26_36	−0.309***	−0.238***	−0.382**
	(0.102)	(0.0779)	(0.149)
age37_47	−0.562***	−0.405***	−0.678***
	(0.0929)	(0.0708)	(0.132)
age48_58	−0.687***	−0.483***	−0.816***
	(0.0976)	(0.0713)	(0.133)
age59_69	−0.564***	−0.396***	−0.661***
	(0.116)	(0.0833)	(0.141)
age70	Omitted	Omitted	Omitted
N	142,112	142,112	142,112
R^2	0.199		
pseudo R^2		0.054	0.056

Source: The data comes from EU-SILC 2013, contains only records of employees reporting their life satisfaction, and are weighted by the sample weights.

Notes: Only results of the material indicators from the model specified in Equation 4.2 are reported. Full results can be found in Table B.4 in Appendix. Standard errors in parentheses clustered at country-level. ***, **, and * denote statistical significance at the 1 %, 5 %, and 10 % level.

EUR 1,023 and EUR 1,382. It is also possible that the youngest and the oldest part of the population are in such life stadium, when income does not play a crucial role for their life satisfaction. For example, the 70 and more years old working people might have job as a hobby because they might have enough savings to live only from them and the pension. Further, the sample contains only 454 employees over 70 years and any regression find no significant effect on life satisfaction for them.

The income effect diminishes with increasing quantiles of population for all age cohorts. The most sensitive to income changes is the 10th quantile. With every percentage point increase of income their life satisfaction increases by up to 0.134 - 0.179 depending on age. This accounts for up to 10 percentage points of the life satisfaction standard deviation. These results suggest that the low income people with lower life satisfaction levels are most sensitive to the income change. Similarly, Gomanee *et al.* (2005) have found that publicly provided aid is more effective in countries with low welfare. Across all quantiles of the sample population the highest and positive income effect is found by people between 48 and 58 years. It is also the only age cohort for which the income effect is significant in all quantiles. The effect is almost two times stronger in the first two quantiles (up to 0.179 and 0.150) than in 50th quantile (up to 0.085), and then weakens to the level similar to the income effect prediction of the full OLS model, at 90th quantile (0.058). This finding is confirmed

also by the results of OLS regressions across the age cohorts. People between 48 and 58 years have with each percentage of income increase on average by 0.165 higher life satisfaction (other things equal). On the same time, the previous findings on the whole sample population summarized in Tables 6.5, 6.4, and 6.3, indicate that the people between 48 and 58 are on average ceteris paribus the least satisfied with their lives. Similarly, Proto & Rustichini (2012) analyze the psychological aspects of life satisfaction and suggest, that with the worsening of the psychical condition low earners tend to fulfill their aspirations and high earners not.

The ability to pay unexpected expanses is in contrast to the income effect significant on 1% level at 10th (0.633), 25th (0.515), and 75th (0.343) quantile for the youngest age cohort 15-25 years. Prediction for the remaining two quantiles is, however, insignificant statistically and economically. Across the age cohorts from 25 to 69 years the predicted effect of *payunexp* follows similar distribution of steadily decreasing magnitude with higher quantiles. Only between the 50th and 75th quantiles of age cohorts 26-36 and 48-58 the drop is almost by one half. This suggest that the effect of the ability to pay unexpected expanses does not depend much on age, but differs across various quantiles. Looking only on the 25 to 69 years cohorts its impact oscillates from 0.831 to 0.988 at 10th quantile and from 0.243 to 0.654 at 90th quantile. The age cohort above 70 years does not have any significant *payunexp* effect. The *payunexp* OLS prediction for age cohorts 26-36 and 37-47 is around 0.77 significant at 1% level and for age cohorts 48-58 and 59-69 around 0.5 which is similar to the full sample OLS model presented in Table 6.3. This indicates that the effect of ability to pay unexpected expanses is robust at least across age from 25 to 69.

The estimates of the ability to pay one meal with meat (or its vegetarian equivalent) every second day behave similarly to the estimates of the ability to pay unexpected expanses effect on life satisfaction. Their magnitude is, however, lower and similar to the full OLS model estimates at approximately 0.5 across all age cohorts and quantiles, except the 10quantile. The lowest proportion of the population is most sensitive to the income changes and the effect grows in age (up to 0.714 for youngest cohort and up to 1.151 for 59-69 age cohort). The *paymeat* effect is again insignificant only for the age cohort over 70 years. The OLS predictions on sub-samples of age cohorts differ compared to the *payunexp* estimates. Significant is only the age cohort 48-58 with magnitude 0.497 and age cohort 59-69 with 1.143. This might be explained if in the 25th quantile of population would be majority of individuals that cannot afford to pay meal with meat every second day.

In conclusion, material prosperity significantly and positively relates to individuals‘ life satisfaction. The correlation is quite stable for the abilities to pay unexpected expanses and to afford to pay one meal with meat every second day. The *paymeat* impact on life satisfaction is alike the income effect most significant in middle-age cohorts (age of 48-69 and for *paymeal* already 37-47). The correlation between in-

come and life satisfaction is strongest and significant for employees of 48-58 years old across all quantiles. The magnitudes of the full OLS model estimates are alike the quantile regression estimates of 50th to 90th quantile.

Table 6.6: The impact of material prosperity on happiness for particular quantiles of age cohorts

Response var.: Life satisfaction	OLS	Q10	Q25	Q50	Q75	Q90	n
Explanatory var.				**Log(income)**			
Age cohort	−0.00322	−0.00884	−0.00425	$3.90e-16$	−0.000687	$-2.24e-16$	9,573
15 - 25	(0.0371)	(0.00933)	(0.0131)	(0.0515)	(0.00963)	(0.646)	
Age cohort	0.0919**	0.119***	0.0579***	$3.55e-15$	0.0215***	0.00723	32,921
26 -36	(0.0446)	(0.00667)	(0.0181)	(0.00931)	(0.00606)	(0.0207)	
Age cohort	0.0761**	0.134***	0.0773***	0.0427***	0.0286**	0.00709	45,263
37 - 47	(0.0359)	(0.0455)	(0.0154)	(0.00481)	(0.0112)	(0.00997)	
Age cohort	0.165***	0.179***	0.150***	0.0851***	0.0377**	0.0585***	43,483
48 - 58	(0.0546)	(0.0284)	(0.0325)	(0.0192)	(0.0163)	(0.0186)	
Age cohort	0.139***	0.157***	0.154***	0.0772***	0.0335	0.00224	11,319
59 - 69	(0.0337)	(0.0348)	(0.0214)	(0.0235)	(0.0249)	(0.0296)	
Age cohort	0.261	−0.0966	−0.0379	−0.0180	0.0408	0.104	454
70^{+}	(0.227)	(0.251)	(0.162)	(0.114)	(0.152)	(0.278)	
Explanatory var.				**Ability to pay unexpected expanses**			
Age cohort	0.165	0.633***	0.515***	$-4.19e-15$	0.343***	$2.75e-15$	9,573
15 - 25	(0.382)	(0.0899)	(0.0999)	(1.048)	(0.0657)	(1.850)	
Age cohort	0.786***	0.913***	0.713***	1.000***	0.441***	0.243***	32,921
26 -36	(0.222)	(0.0378)	(0.0497)	(0.0391)	(0.0240)	(0.0380)	
Age cohort	0.749***	0.988***	0.867***	0.537***	0.410***	0.306***	45,263
37 - 47	(0.107)	(0.0543)	(0.0416)	(0.0281)	(0.0279)	(0.0288)	

Response var.:	OLS	Q10	Q25	Q50	Q75	Q90	n
Life satisfaction							
Age cohort	0.417*	0.839***	0.865***	0.669***	0.359***	0.252***	43,483
48 - 58	(0.209)	(0.0496)	(0.0439)	(0.0363)	(0.0351)	(0.0507)	
Age cohort	0.542**	0.831***	0.798***	0.686***	0.442***	0.654***	11,319
59 -69	(0.253)	(0.0993)	(0.0825)	(0.0790)	(0.0564)	(0.158)	
Age cohort	−2.617	1.149	0.676	0.466	−0.234	−0.0741	454
70^{+}	(2.538)	(1.474)	(0.622)	(0.342)	(0.352)	(0.931)	
Explanatory var.	**Ability to pay one meal with meat each second day**						
Age cohort	0.810	0.714***	0.535***	$-5.07e-15$	0.184**	$-1.29e-15$	9,573
15 - 25	(0.552)	(0.100)	(0.160)	(0.536)	(0.0770)	(2.323)	
Age cohort	0.233	0.780***	0.687***	$4.57e-14$	0.305***	0.217***	32,921
26 - 36	(0.440)	(0.120)	(0.132)	(0.0406)	(0.0677)	(0.0684)	
Age cohort	−0.0180	0.930***	0.689***	0.596***	0.440***	0.148***	45,263
37 - 47	(0.323)	(0.135)	(0.0610)	(0.0670)	(0.0701)	(0.0538)	
Age cohort	0.497***	0.916***	0.540***	0.522***	0.429***	0.427***	43,483
48 - 58	(0.134)	(0.0701)	(0.0771)	(0.0745)	(0.0719)	(0.0649)	
Age cohort	1.143**	1.151***	0.673***	0.677***	0.542***	0.384**	11,319
59 - 69	(0.441)	(0.267)	(0.101)	(0.125)	(0.131)	(0.181)	
Age cohort	2.511	−0.714	0.0670	0.380	0.587	0.691	454
70^{+}	(2.470)	(2.049)	(1.218)	(0.741)	(0.910)	(2.445)	

Source: The data comes from EU-SILC 2013, contains only records of employees reporting their life satisfaction, and are weighted by the sample weights.

Notes: Standard errors in parentheses clustered at country-level. ***, **, and * denote statistical significance at the 1 %, 5 %, and 10 % level.

6.3.3 Post-communist countries

Table 6.7[4] summarizes the OLS models with further personal characteristics and inspect the common pattern of post communist countries and of income diversity. Post communist countries seem to have common characteristics that decrease the average level of life satisfaction.

OLS–2 extends the basic model only by the *curtain* dummy checking the common features of countries behind the former iron curtain. In OLS–2, one country dummy for a non-post communist country (Iceland) and one for a post communist country (Slovenia) is omitted as the baseline to avoid collinearity. The *curtain* estimate of -0.762 statistically significant at 1% level indicates that people in the post communist countries are on average significantly less satisfied with their lives. This also holds for the OLS-5 model, that uses as income proxy the distance of individual income from regional median income, *income_diff*. The *curtain* dummy estimate equals -0.523 and is significant at 1% level. This means a change of life satisfaction by 5 percentage points of the life satisfaction variance.

OLS–4, that controls for both absolute (*lg_income*) and relative (*income_diff*) income level, estimates the effect of living in a post communist country (*curtain*) positively at 1.124 statistically significant at 10% level. It means a change of life satisfaction corresponding to 11 percentage points of its variance. The change of the sign might be caused by the effect of income disparity and simultaneously of absolute income level. Because the difference in regional income varies more in non-post communist countries. The communist policy was to equalize the society and the impact is still evident. Further, people in the post communist countries have on average significantly lower income (on average EUR 350 per month) than people in non-post communist countries (on average EUR 2,260 per month). Since the *lg_income* and the *income_diff* estimates are similar in magnitude but opposite in sign (-0.342 and 0.393, respectively) the positive estimate of *curtain* might equalize the on average lower absolute income level in the post communist countries. Similarly, the country effects in OLS–3 are higher than in the basic OLS model presented in Table 6.3 that do not account for income difference. For example, the country effect of Slovenia in OLS–3 1.124 is higher than in the basic OLS model -0.762. On the contrary the country effects of models OLS–2 and OLS–5 are similar since also the impact of absolute and relative income levels are similar.

Taking the regional income difference as proxy for the financial situation, people in the countries of the former iron curtain still seems to be less satisfied with their lives than people on the west.

[4]Table B.5 in Appendix displays all results.

6.3.4 Income inequality

Income inequality shapes the life satisfaction in both directions based on the relative position. The OLS–5 model presented in Table 6.7 predicts positive impact of income difference on life satisfaction. The interpretation is not straightforward since the *income_diff* is the difference between the logarithm of income and the logarithm of regional median of income (Equation 5.1), and therefore *income_diff* differs at various levels of income in each country differently. Nevertheless, people with higher than median income are on average more satisfied than people with lower than median income. For example, life satisfaction of people with the lowest relative income in the sample (*income_dif* −10.382) is by 0.787 lower than the life satisfaction of people with the highest possible relative income in the sample (*income_diff* 4.221). This means that the income difference accounts for up to 8 percentage points of life satisfaction variance.

Income inequality plays an important role for life satisfaction if the differences of income within the region are huge. Therefore the hypothesis that people with lower than median income tend to be on average less satisfied, and people‘s reference point influence their satisfaction cannot be rejected. Note that the region corresponds in 18 out of 32 countries to the country level because the used NUTS-1 correspond to the whole country or as in case of Germany, Netherlands, Portugal, Serbia, and Slovenia the EU-SILC 2013 sample does not contain the information about regions.[5] Regional income difference in that countries incorporates the information about median income of the whole country.

6.3.5 Well-being drivers within the countries

The models presented in Table 6.3 identified significant fixed effect of individual countries on life satisfaction. Table 6.8 presents estimates of possible life satisfaction drives within particular countries as specified by Equation 4.5. Both models in Table 6.8 through WLS explain more than 51% of the country effect variance on life satisfaction. The weather data are not available for Iceland and therefore the number of observations is lower by 1,530 than in the previous models. Because the applied weights base on a nationally representative probability sample, the analysis on this restricted sample should provide consistent results.

For the selection of predictors stepwise regression is applied. The forward approach begins with empty model and adds variables significant at 5% level; the backward approach begins with the full model and removes the variable if it is not significant at least at 10% level; the inclusion limit is again 5% level significance (for details of the stepwise regression see Draper & Smith (1981)). Considered are these

[5]The results of analysis on the sub-sample that excludes Germany, Netherlands, Portugal, Serbia, and Slovenia are similar to the results of the whole sample.

Table 6.7: The impact of material prosperity on happiness: Model extension

Responsse variable life satisfaction	OLS - 2	OLS - 3	OLS - 4	OLS - 5
lg_income	0.0497***	−0.342**	−0.342**	
	(0.00714)	(0.126)	(0.126)	
income_diff		0.393***	0.393***	0.0511***
		(0.125)	(0.125)	(0.00689)
curtain	−0.762***		1.124*	−0.523***
	(0.0430)		(0.608)	(0.0130)
Iceland	Omitted	Omitted	Omitted	Omitted
Slovenia	Omitted	1.124*	Omitted	Omitted
	(.)	(0.608)	(.)	(.)
_cons	7.961***	11.33***	9.944***	8.217***
	(0.195)	(1.284)	(0.633)	(0.184)
N	142,112	142,112	142,112	142,112
R^2	0.201	0.202	0.202	0.201

Standard errors in parentheses clustered at country level.

Source: The data comes from EU-SILC 2013, contains only records of employees reporting their life satisfaction, and are weighted by the sample weights.

Note: The table presents only selected variables that differ from the basic OLS model presented in **??**, full results can be found in Table B.5. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

variables: CPI2012 – Corruption Perception Index of 2012; DI2012 – Democracy Index of 2012; GDP of the year 2012 in EUR Purchasing Power Parity; GDP growth in 2012; governmental expenditures per 2012; Gini coefficient of equalized disposable income that captures the income inequality in the country; average unemployment; average amount of solar radiation during the year 2012; average temperature; number of sunny days; and number of rainy days.

Both stepwise regression procedures predict significant negative impact of Gini coefficient and of the weather conditions. Forward stepwise regression predicts negative effect of the average amount of solar radiation per year - *sun_avg*, and backward positive effect of number of *rainy_days*. Having by 1000 KJ/m^2/year more solar radiation decreases the life satisfaction within the country by 0.119. This corresponds to 1% of the life satisfaction variance. On the contrary 10 more rainy days per year increase life satisfaction by 0.07. The difference in life satisfaction between the sunniest country in the sample (Malta) and the least sunny country (Norway) is then 1.3524 to the least sunnier Norway. Malta and Norway are also the countries from the sample with the lowest and highest number of rainy days, respectively. The backward stepwise model predicts life satisfaction higher in Norway by 1.124. The weather effect therefore accounts for up to 13% of the life satisfaction variance.

The negative sign of Gini coefficient confirms the finding from models with income

difference defined in Equation 5.1, that income inequality decreases life satisfaction. The increase of income inequality corresponding to one point increase of Gini coefficient lowers life satisfaction by 0.067 with 5% significance level according to forward model, and by 0.111 with 1% significance level. It means a change of life satisfaction by up to 11% of its variance with 1 point Gini coefficient increase.

This finding is in accordance with the current happiness research, for example Kahneman & Riis (2005), that the north European countries are on average happier. In the north solar radiation is lower and on the contrary more days in the year are raining. The negative effect of Gini coefficient confirms the negative income inequality impact on life satisfaction reported in Table 6.7 and supports so the hypothesis that people with lower than median income tend to be on average less happy.

Table 6.8: Testing the difference of happiness between countries

Response variable: Estimated country effects	Stepwise – forward	Stepwise – backward
Gini	-0.0672^{**}	-0.111^{***}
	(0.0323)	(0.0326)
sun_avg	-0.000119^{***}	
	(0.0000351)	
rainy_days		0.00754^{***}
		(0.00207)
_cons	2.899^{***}	1.812^{*}
	(0.845)	(0.996)
N	31	31
R^2	0.515	0.572

Standard errors weighted by the precision of the estimated country effects in parentheses
Note:
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

6.4 Robustness checks – other measures of well-being

The relationship between subjective well-being and material prosperity is found also in models with alternative measures of subjective well-being oriented more on the mood evaluation. These measures might capture the hedonic part of subjective well-being. And might be more objectively evaluated as the questions regarding the frequency of feelings are more specific than the abstract valuation of life satisfaction. The well-being drivers predicted by these proxies of subjective well-being differ only slightly from the models with life satisfaction. Again, the ordered probit and ordered logit specifications defined in Equation 4.6 confirm the OLS predictions in sign and statistical significance.

6.4.1 Feeling happy

Table 6.9 reports the results of the basic model (Equation 4.1) with the frequency of feeling happy during the past four weeks as dependent variable. Almost all estimates are very similar to the basic model predictions for life satisfaction in Table 6.3. The positive mood – feeling happy – is evoked with being *married* or if working less than 30 hours per week by contentment with the working hours *want_nmh*; and suppressed by working less hours than wanted, having only *elementary_work*, having *bad_living* conditions, living in an area of high *crime* occurrence, and having some *health_limit*. The effect of *age* is estimated to have the same concave relationship with feeling happy as with life satisfaction. With each other year the happy feeling is less frequent with minimum at 53.8 years old.

The income effect does not seem to be relevant for happy feeling, the OLS estimate is low 0.010 and statistically insignificant. The other two material prosperity proxies remain positive, statistically significant at 1% level, and similar in magnitude. The abilities to pay unexpected expenses (*payunexp*) and to pay on meal with meat each second day (*paymeat*) both lead to feeling happy more frequently. While the income effect alone has negligible impact the relationship between material prosperity and feeling happy is still positive.

Each *hour_worked* per week more has two times stronger negative effect on feeling happy (-0.00667) than on life satisfaction. Working less than 30 hours per week because of *housework*, that increases life satisfaction, seems to have no important effect on feeling happy; the estimate (-0.012) is statistically insignificant. Likewise the effect of hawing *own* dwelling diminishes in terms of feeling happy (0.018 statistically insignificant).

Similarly while females report on average slightly higher life satisfaction; they feel slightly less frequent happy. The estimate of *female* yields -0.092 statistically significant at 1% level. Having children brings more frequent happy feeling (0.082) that is now statistically significant. Having a *friend* has even stronger positive effect on feeling happy than on life satisfaction 1.287 again statistically significant at 1% level.

The biggest difference is in education effect. While tertiary education increases life satisfaction compared to secondary education by 0.148, it lowers a bit the frequency of feeling happy by 0.051 – statistically significant at 5% level. The impact of having only temporary job *temp_job* is weaker -0.067 statistically significant at 5% level and *manager*ial position intensifies the happy feeling less than satisfaction, by 0.098 statistically significant at 1% level.

Table 6.9: The effect of material prosperity on feeling happy

Response variable: feel happy	OLS	OProbit	Ologit
lg_income	0.00972	0.00363	0.00781
	(0.00789)	(0.00445)	(0.00730)
hour_worked	−0.00667***	−0.00360***	−0.00660***
	(0.00128)	(0.000687)	(0.00116)
underemployed	−0.282***	−0.147***	−0.267***
	(0.0917)	(0.0512)	(0.0946)
want_nmh	0.165***	0.0869***	0.171***
	(0.0234)	(0.0125)	(0.0204)
housework	−0.0115	−0.00956	−0.0266
	(0.0682)	(0.0397)	(0.0648)
other_reason	−0.0256	−0.00789	−0.0272
	(0.0398)	(0.0247)	(0.0447)
elementary_work	−0.0958***	−0.0462**	−0.0913***
	(0.0337)	(0.0184)	(0.0279)
payunexp	0.403***	0.214***	0.394***
	(0.0280)	(0.0118)	(0.0204)
paymeat	0.422***	0.198***	0.363***
	(0.0471)	(0.0249)	(0.0389)
bad_living	−0.213***	−0.119***	−0.214***
	(0.0334)	(0.0172)	(0.0294)
crime	−0.299***	−0.160***	−0.299***
	(0.0299)	(0.0156)	(0.0286)
age	−0.0931***	−0.0524***	−0.0953***
	(0.00607)	(0.00386)	(0.00759)
age_sq	0.000865***	0.000490***	0.000897***
	(0.0000681)	(0.0000458)	(0.0000897)
married	0.336***	0.184***	0.333***
	(0.0287)	(0.0153)	(0.0273)
female	−0.0921***	−0.0510***	−0.0872***
	(0.0291)	(0.0154)	(0.0279)
child	0.0824***	0.0443***	0.0623***
	(0.0218)	(0.0130)	(0.0238)
female_child	−0.0932***	−0.0519***	−0.0844***
	(0.0276)	(0.0155)	(0.0286)
widow	−0.310***	−0.135***	−0.255***
	(0.0749)	(0.0359)	(0.0701)

Response variable: feel happy	OLS	OProbit	Ologit
friend	1.287***	0.632***	1.158***
	(0.166)	(0.0915)	(0.172)
health_limit	−0.644***	−0.338***	−0.605***
	(0.0526)	(0.0300)	(0.0572)
primary	−0.0935	−0.0510	−0.101
	(0.0923)	(0.0474)	(0.0881)
tertiary	−0.0506**	−0.0343**	−0.0611**
	(0.0242)	(0.0138)	(0.0240)
temp_job	−0.0672**	−0.0361**	−0.0660**
	(0.0300)	(0.0175)	(0.0324)
manager	0.0981***	0.0568***	0.106***
	(0.0220)	(0.0120)	(0.0193)
own	0.0179	0.00907	0.0163
	(0.0176)	(0.00925)	(0.0187)
_cons	7.341***		
	(0.167)		
N	140515	140515	140515
R^2	0.135		
pseudo R^2		0.055	0.057

Standard errors in parentheses

Note:

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 6.10 shows that the age effect on feeling happy only slightly differs from the age effect on life satisfaction. The highest negative impact remains within the 48–58 age cohort -0.590 compared to the age group over 70 years old. The youngest cohort seem to be more frequently (by 0.232) feeling happy than the oldest cohort, but the estimate is not statistically significant. From 25 until at least 70 years old each additional year brings less frequent happy feeling.

6.4.2 Happiness Index

Table 6.11 summarizing the models that measure well-being via Happiness Index shows that the effects on well-being might be somewhere between the estimates of Life satisfaction models and Happy feeling models. Again positive effect of material prosperity is estimated. Income effect is a bit lower 0.024 than in Life satisfaction model and statistically significant at 1% level. Ability to pay unexpected expanses *payunexp* increases HI by 0.0454 and ability to pay on meal with meat each second

Table 6.10: The effect of age on feeling happy

	OLS	OProbit	Ologit
main			
age15_25	0.232	0.113	0.223
	(0.163)	(0.0931)	(0.155)
age26_36	−0.140	−0.0945	−0.146
	(0.147)	(0.0856)	(0.148)
age37_47	−0.440***	−0.262***	−0.448***
	(0.136)	(0.0788)	(0.133)
age48_58	−0.590***	−0.342***	−0.585***
	(0.137)	(0.0777)	(0.129)
age59_69	−0.497***	−0.288***	−0.484***
	(0.138)	(0.0762)	(0.126)
age70	Omitted	Omitted	Omitted
N	140515	140515	140515
R^2	0.133		
pseudo R^2		0.054	0.056

Source: The data comes from EU-SILC 2013, contains only records of employees reporting their life satisfaction, and are weighted by the sample weights.

Notes: Only results of the material indicators from the model specified are reported. Full results can be found in Table B.1 in Appendix. Standard errors in parentheses clustered at country-level. ***, **, and * denote statistical significance at the 1 %, 5 %, and 10 % level.

day by 0.416, both significant at 1% level. Assuming again 1% income increase (the standard deviation of income), material prosperity rises HI by 0.894. That is lower improvement than by life satisfaction, but material prosperity still accounts approximately for 50 percentage points of the HI standard deviation.

The impact of each *hour_worked* per week is even stronger than in case of happy feeling lowering HI by 0.008. The ratio to income is therefore three times higher than in case of life satisfaction. People would switch 10 more hours of work per week for 3.415% income increase. Working less than 30 hours per week because of inability to find job again weakens the income effect by 0.317; because of contentment with the number of hours on the contrary increases HI by 0.114. In contrast to both happy feeling and life satisfaction, *other_reason*s for working less than 30 hours per week decrease the HI by 0.154. And all these estimates are statistically significant at 1% level. Insignificant is a negative effect of working less than 30 hours per week.

Several factors have as in previous cases a negative effect on HI; *elementary_work* -0.105, *bad_living* conditions -0.231, *crime* in the living area -0.366, *widow*hood -0.248, some serious *health_limit* -0.766, and temporary job *temp_job* -0.096; all statistically significant at 1% level. Similarly being *married* or having anyone to discuss personal matters with *friend* increase the Happiness Index by 0.110 and 1.096, respectively. Having *own* dwelling also does not influence the HI as it does not influence the happy feeling.

Happiness Index is also concave in age; now with minimum at age 93.6 but the impact is weaker than in case of feeling happy and of life satisfaction. For example 40 years old person is by 0.295 less satisfied with life than 30 years old person but the HI is lower only by 0.152. This pattern is also captured in Table 6.12 with results of model with age cohorts.

*Female*s have on average by 0.368 lower HI and *child*ren lower HI only negligibly by 0.0518 but for both genders equally since *female_child* is insignificant. And *tertiary* education increases by 0.056 HI and the estimate is statistically significant at 5% level and life satisfaction by 0.148. Therefore education seems to be less important for feelings than for life satisfaction.

The Happiness Index express the overall mood of the respondents and similarly as their life satisfaction is determined by by many aspects of peoples lives like marriage, gender, children, education and living environment. Most important seems to be again the social factors like having friends, good health, and also the material prosperity.

Table 6.11: The effect of material prosperity on Happiness Index

	OLS	OProbit	Ologit
Happiness Index			
lg_income	0.0236***	0.0123***	0.0225***
	(0.00743)	(0.00456)	(0.00769)
hour_worked	−0.00806***	−0.00492***	−0.00851***
	(0.00145)	(0.000833)	(0.00169)
underemployed	−0.317***	−0.183***	−0.321***
	(0.0648)	(0.0374)	(0.0710)
want_nmh	0.114***	0.0623***	0.109***
	(0.0202)	(0.00947)	(0.0211)
housework	−0.0574	−0.0442	−0.0664
	(0.0505)	(0.0273)	(0.0509)
other_reason	−0.154***	−0.0901***	−0.182***
	(0.0337)	(0.0221)	(0.0355)
elementary_work	−0.105***	−0.0575***	−0.119***
	(0.0235)	(0.0135)	(0.0230)
payunexp	0.454***	0.274***	0.479***
	(0.0291)	(0.0155)	(0.0235)
paymeat	0.416***	0.235***	0.415***
	(0.0481)	(0.0266)	(0.0444)
bad_living	−0.231***	−0.149***	−0.267***
	(0.0183)	(0.0122)	(0.0221)

	OLS	OProbit	Ologit
Happiness Index			
crime	−0.366***	−0.224***	−0.397***
	(0.0291)	(0.0176)	(0.0303)
age	−0.0602***	−0.0380***	−0.0664***
	(0.00652)	(0.00371)	(0.00749)
age_sq	0.000643***	0.000411***	0.000717***
	(0.0000659)	(0.0000388)	(0.0000795)
married	0.110***	0.0666***	0.122***
	(0.0185)	(0.0111)	(0.0200)
female	−0.368***	−0.236***	−0.420***
	(0.0466)	(0.0276)	(0.0498)
child	−0.0518***	−0.0368***	−0.0691***
	(0.0154)	(0.0108)	(0.0200)
female_child	−0.00440	0.00404	0.0159
	(0.0348)	(0.0181)	(0.0297)
widow	−0.248***	−0.141***	−0.248***
	(0.0395)	(0.0238)	(0.0503)
friend	1.096***	0.621***	1.114***
	(0.0798)	(0.0488)	(0.0903)
health_limit	−0.766***	−0.453***	−0.779***
	(0.0438)	(0.0290)	(0.0543)
primary	−0.0926	−0.0530	−0.104
	(0.0843)	(0.0475)	(0.0931)
tertiary	0.0557**	0.0199	0.0369
	(0.0228)	(0.0161)	(0.0276)
temp_job	−0.0963***	−0.0585***	−0.102***
	(0.0240)	(0.0127)	(0.0204)
manager	0.0378*	0.0227*	0.0406*
	(0.0202)	(0.0134)	(0.0231)
own	−0.000558	0.000615	0.00882
	(0.0223)	(0.0151)	(0.0276)
_cons	6.944***		
	(0.150)		
N	138918	138918	138918
R^2	0.171		
pseudo R^2		0.034	0.035

Standard errors in parentheses

Note:

	OLS	OProbit	Ologit
Happiness Index			

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 6.12: The effect of age on Happiness Index

	OLS	OProbit	Ologit
Happiness Index			
age15_25	-0.156	-0.135^{*}	-0.204
	(0.127)	(0.0815)	(0.142)
age26_36	-0.369^{***}	-0.264^{***}	-0.434^{***}
	(0.120)	(0.0778)	(0.142)
age37_47	-0.492^{***}	-0.339^{***}	-0.564^{***}
	(0.114)	(0.0713)	(0.129)
age48_58	-0.512^{***}	-0.348^{***}	-0.578^{***}
	(0.109)	(0.0671)	(0.122)
age59_69	-0.361^{***}	-0.246^{***}	-0.401^{***}
	(0.113)	(0.0684)	(0.125)
age70	Omitted	Omitted	Omitted
N	138918	138918	138918
R^2	0.170		
pseudo R^2		0.034	0.035

Source: The data comes from EU-SILC 2013, contains only records of employees reporting their life satisfaction, and are weighted by the sample weights.

Notes: Only results of the material indicators from the model specified are reported. Full results can be found in Table D.2 in Appendix. Standard errors in parentheses clustered at country-level. ***, **, and * denote statistical significance at the 1 %, 5 %, and 10 % level.

Chapter 7

Discussion

The objective of this thesis is to reveal the nature of the correlations between material prosperity and subjective well-being.[1] It studies the influence of income inequality, job conditions, and how the correlations evolve during life periods controlling for other personal characteristics. Besides, the within country drivers of subjective well-being are analyzed. The thesis provides OLS, ordered probit, and ordered logit analysis of 142,112 employees with three measures of subjective well-being on individual data from EU-SILC 2013. First, in the literature commonly used life satisfaction (Headey & Wooden 2004; Di Tella & MacCulloch 2008; Caporale *et al.* 2009; Clark *et al.* 2015), that ranges from 0 to 10 with median of 8. Second, the frequency of feeling happy in the past four weeks that is rescaled form 5 possible frequency answers to range from 0 to 10 and its median is 7.5. Lastly, the designed Happiness Index that includes five questions on feelings frequency in the last four weeks. The Happiness Index also achieves values from 0 to 10 with median 7.5.

Happiness literature that uses also the micro-level data, bases the analysis more often on the household income that might provide inaccurate information about the accessible income of the individuals (Rojas 2011). This thesis combines the reported individual income with answers regarding the ability to pay unexpected expanses (*payunexp*) and the ability to pay one meal with meat or its vegetarian substitute each second day (*paymeat*). These three records together represents the material prosperity effect on subjective well-being.

The data set covers 32 European countries, therefore the interpretation of the results might be only with respect to European countries. Assuming similar cultural background within the whole Europe, the extension to other (than included) European countries might be possible.

[1] Happiness and subjective well-being are assumed to be interchangeable.

7.1 Easterlin paradox lost

The thesis provides several possible explanations for the so called Easterlin paradox. Eastrlin paradox refers to relatively stable subjective well-being levels and increasing income (GDP) over time, although these two seem to be correlated at one point in time. My analysis identified several non-pecuniary factors that might be stable over time and influence subjective well-being.

7.1.1 Income inequality

Significant impact of income inequality is identified in two ways. First, three OLS models find significant positive effect of difference between income and median of regional income. Above median income earners tend to be happier and below median income earners less happy. This favors the explanation, that people tend to compare themselves with their neighbors. As a consequence if the average income in the region increases to everyone proportionally, the average level of happiness remains the same level too. Thus it explains the Easterlin paradox. Oishi & Kesebir (2015) found that after controlling for income inequality life satisfaction is positively correlated to GDP per capita.

Second, estimated country effects are regressed in two stage WLS on the country characteristics. The negative estimate of Gini coefficient (-0.111) predicts lower average happiness level in more unequal countries. As Figure 5.5 shows, the distribution of income is highly skewed to the origin. Therefore more employees have the below median income and the results support the hypothesis that below median income negatively influences subjective well-being as the literature also denotes (Graham & Pettinato 2002; Oshio & Urakawa 2014).

7.1.2 Social factor

15 OLS models identify as the strongest effect on happiness to have a fried to discuss personal matters with. Its magnitude oscillates around 1, that means, for example, the change of life satisfaction by 57 percentage points of its standard deviation. Having such a friend means that the individual is not isolated in the society and probably have a good relationships with others. The ordered response models confirm the robustness of this result with the same sign and significance.

Further, the results on various age groups sub-samples indicate that income effect significantly changes with age. This is a crucial and so far unexplored possible explanation of the Easterlin paradox. Although the happiness literature well documents a U-shape pattern of subjective-well being with age (Guriev & Zhuravskaya 2009; Blanchflower & Oswald 2004; Graham *et al.* 2004), the analysis of how the correlation evolves with age is missing.

Employees between 48 and 58 years are on average ceteris paribus the least satisfied with their lives and meanwhile the most sensitive to income changes. This might suggest that people getting into senior positions demand higher wages that either does not come or their excessive care about the income brings them distress that leads to lower life satisfaction. Another explanation might be that the life style coming during the age of 48 - 58 is less happy than in other life stadiums (the life aspirations might not be fulfilled, children are out of the house, the depression from ageing might come). The social factors of life during the years 48-58 worsens bringing may be more stress, and therefore the income effect becomes more important. This explanation is supported by Proto & Rustichini (2012), who analyze the psychological aspects of life satisfaction and suggest, that with the worsening of the psychical condition low earners tend to fulfill their aspirations while high earners not. It corresponds also to the results that income effect decreases with higher quantiles of the population. It might be the case, that with higher income also aspirations rise faster. Therefore even the same percenteage change of income brings less subjective well-being to the high earners than to the low earners. The aspiration aspect connected with the issue of reference point is hot topic in the happiness literature (Proto & Rustichini 2012; Groot & Maassen Van Den Brink 2000; Easterlin 1973). The rise (or decline) of aspirations is called a *hedonic* adaptation. Easterlin (2003) argues that the adaptation affects subjective well-being more in pecuniary than non-pecuniary domains.

Age serves as a proxy for social aspect of specific life stadiums that influence subjective well-being. The results reveal that the social aspects of life might play a crucial role for well-being as they not only influence subjective well-being directly but might also change the relative importance of other factors. It explains the Easterlin paradox – why on the country level the average level of subjective well-being does not change with increasing income. The average social conditions within the country often change only negligibly within the time of individual‘s life.

7.1.3 Country happiness drivers

The last suggested explanation of the Easterlin paradox dwell on the over time more or less stable environmental conditions within the country. It might include the legal framework of the country, quality of institutions, culture, historical factors, religion, and economic indicators such as GDP or unemployment. The highest difference in country effects of the sample countries is between Bulgaria and Finland. Its magnitude (2.4) corresponds to 136 percentage points of the life satisfaction standard deviation.

Similarly as Di Tella *et al.* (2001) I use two stage WLS and regress the estimated values of country effects from the basic OLS model on two most significant

country characteristics, Gini coefficient and either number of rainy days or average solar radiation during the last year. The models predict that employees in countries with better weather conditions (more sun and less rainy days) are on average less happy. This is in contrast to my first expectations that good weather might positively influence mood and the long-lasting effect might affect the overall subjective well-being.

Nevertheless, weather might serve as an indicator of every day structure customs in the countries. For example, people in Italy especially in the summer work often on two shifts (early morning and late afternoon) because of high temperatures during noon. This work-day structure limits also their leisure time in two ways. First, the leisure time is separated into two periods which restricts the individuals only to shorter lasting activities. Second, the noon leisure time might be less valuable because the high temperatures are exhausting. On the contrary, in Norway there is half year day light and half year semidarkness. On one hand, it probably increases the number of people in depression. On the other hand, the weather conditions might deepen the social relationships because as day and night are almost indistinguishable the evening leisure activities may tend to last longer. Further the winter in Norway is much harder which again might deepen the social connections. Not providing help to someone when the temperature is -20 °C could lead to his or her death. Besides next time someone else will be in turn to help you. The bad natural conditions therefore might lead to higher solidarity and possibly also morality.

In the north Euroean countries the weather is worse, Gini coefficient the lowest (highest income equality), and average life satisfaction higher than in the middle and south Europe (see Figure 5.2). Therefore, the model seems to yield reasonable results. Weather might influence subjective well-being either directly but in inverse than expected direction, or trough the consequences for every day‘s life.

Further, the OLS models revealed that in the post communist countries the average level of subjective well-being is significantly lower (by -0.762). This finding is in accordance with Guriev & Zhuravskaya (2009). It indicates that their common history might influence their well-being. The communist policy was to equalize the society and the impact is still evident. Further, employees in the post communist countries have on average significantly lower income (on average EUR 350 per month) than people in non-post communist countries (on average EUR 2,260 per month).

7.2 Main findings

All models find significant positive correlation between material prosperity and happiness. The row correlations between life satisfaction and income similarly as in other studies, for example, (Stevenson & Wolfers 2008) indicate that high income earners tend to report high levels of happiness. The low income people, however,

tend to report all levels of life satisfaction levels equally. Maybe the best view on the relationship provides the quantile regressions.

The quantile regression reveals that the most sensible part of population on income is 10th quantile. For them 1% income increase means higher life satisfaction by 0.119. The change corresponds to 7 percentage points of the life satisfaction standard deviation. The result is robust also across age cohorts sub-sets. On them with every percentage point increase of income life satisfaction increases by up to 0.134 - 0.179 depending on age. This accounts for up to 10 percentage points of the life satisfaction standard deviation. These results suggest that the low income people with lower life satisfaction levels are the most sensitive to the income change. It corresponds to the row correlations find in Figure 6.1.

This is true also for the other two material prosperity indicators. The ability to pay unexpected expanses *payunexp* and the ability to pay meal with meat every second day *paymeat* declines with the higher quantiles of population. Their 50th quantile estimates correspond to the OLS prediction around 0.55. This impact means a change of life satisfaction corresponding to 31 percentage points of its standard deviation.

By comparison of OLS models with and without these two material prosperity indicators was found, that part of the income effect is probably contained in the ability to pay unexpected expanses, but *payunexp* contains also additional (psychical) effect on life satisfaction. On the contrary, the effect of the ability to pay one meal with meat every second day does not seem to contain a part of the income effect, and significantly increases life satisfaction.

The 10th quantile of the sample population seems to be the most heterogenous with regard to life satisfaction variance (see Figure 6.6 depicting the fitted values). This is in accordance with the results. The explanation might be, that people with low income that tend to be more pessimistic (report lower levels of life satisfaction) are the most sensitive to income changes. It suggests that while pessimistic employees rely more on material prosperity, their optimistic counterparts prefer other aspects for being satisfied. The relationship is, however, unclear. It might be also the case, that the poor employees with lower life satisfaction (maybe living in worse conditions?) value every cent more than the high income employees thousands of EUR.

Work and unemployment

Happiness is negatively related to number of hours worked, and if people are restrained in number of hours they want to work, they are less happy. Similarly, Wunder & Heineck (2013) on German cross-section data show that working time mismatch and especially underemployment tend to decrease well-being. My thesis focuses only on employees, but this finding is consistent with the previous re-

search evidence (Helliwell 2003; Wolfers 2003; Di Tella *et al.* 2001; Winkelmann & Winkelmann 1998; Clark & Oswald 1994), that unemployment negatively influences subjective well-being.

There are several other aspects having negative impact on subjective life satisfaction: state of health limiting the person in activities, low level of education, having only temporary job which might increase stress, living in bad environment (= dark flat, pollution, noise or crime in the living area, Problems with accommodation of type: leaking roof, damp walls/foundation, rot in window frames or floor).

Concluding remarks

To sum up, material prosperity might bring more happiness because people can afford to buy more goods & services. Additionally, material prosperity assures certain level of peace of mind, that increases happiness. This interpretation corresponds to the evidence from the graphical inspection of the data in Figure 6.1. High income brings high levels of happiness, but low income does not necessary yield low levels of happiness. Therefore the relationship between material prosperity and happiness is definitely non-linear.

The majority of the relationships are confirmed by the other two measures of subjective well-being. Only the pure income effect on the frequency of feeling happy, however, becomes insignificant. The nuances between the results based on life satisfaction and Happiness Index might be caused because life satisfaction incorporates both *hedonic* and *eudaimonic* part of the subjective well-being while HI and feeling happy only the *hedonic* part. *Hedonic* because of the subjectivity of life satisfaction valuation, and *eudaimonic* because life satisfaction covers also the satisfaction with self-realization. Then the insignificance of income effect on feeling happy might indicate that income might not influence feelings. The Happiness Index, on the other hand, bases on both positive and negative feelings and therefore it might be a good measure of the revealed well-being.

The results seem to be robust across all applied models. Nevertheless, the non-pecuniary factors might influence subjective well-being more. Good social relationships and maybe also positivistic nature of the individuals tend to have positive impact on subjective well-being. The results might lead to the conclusion that if governments would focus more on social relationships within the society and cultivate good morals, people would be better-off. The cultivation of morals is hard but laws promoting justice, and enforcement of their compliance may be a good first step. It means also to eliminate corruption. This interpretation is in accordance with the suggestion of Kahneman (2011), that it is possible to change people‘s mind. People reevaluate their opinions with new experiences. The environment therefore influences their adaptation process.

The finding that employees from around 48 years might be the most sensitive on income changes provide a suggestion why politicians and managers are so highly profit-oriented. The age is connected with senior positions to that definitely belong management of companies and politics. Because people tend to judge others according to themselves and for the managers and politicians income has significant positive impact on their subjective well-being, they focus on profit maximizing. This, however, might lead to sub-optimal social outcome as others seem to be more oriented on non-pecuniary factors.

Chapter 8

Conclusion

The main aim of this thesis was to reveal the nature of the relationship between material prosperity and happiness. The thesis provides analysis of individual data of 142,112 employees from 32 European countries. The material prosperity is measured by individual income, questions on abilities to pay unexpected expenses, and to pay one meal with meat each second day. Happiness is assumed to be interchangeable to subjective well-being and is measured by three indicators ranging from 0 to 10. First, I use the common happiness literature measure, life satisfaction with median of 8. Second, the frequency of feeling happy in the past four weeks that is rescaled form 5 possible frequency answers to range from 0 to 10 and its median is 7.5. Lastly, the designed Happiness Index that includes five questions on feelings frequency in the last four weeks. The Happiness Index focuses more on the *hedonic* part of subjective well-being while life satisfaction incorporates moreover the *eudaimonic* part focused on self-realization. Nevertheless, the two components of subjective well-being interrelates and therefore both might serve as the measure. The construction of the HI was inspired by the current research of Kahneman & Krueger (2006) who argue that the answers might be closer to true values when asked specifically.

I apply OLS, ordered probit and ordered logit regressions with 5 distinct model specifications for each of the subjective well-being measures. For better understanding of the connection between material prosperity and happiness I apply also quantile regressions on the whole sample, and on 6 sub-samples of age cohorts. This complex analysis finds a significant non-linear relationship between material prosperity and happiness. The sample contains, however, large share of employees with low income and high levels of happiness. Their well-being might not be explained though pecuniary effect. Several factors indicate that social factors such as having friend should have stronger effects on subjective well-being.

The main contribution of this thesis is the complex analysis of the happiness drivers. The pure income effect might depend on several other aspects like, for example, age. Although the happiness literature well documents a U-shape pattern of

subjective-well being with age (Guriev & Zhuravskaya 2009; Blanchflower & Oswald 2004; Graham *et al.* 2004), the analysis of how the correlation evolves with age is missing. My thesis reveals that the relationship between material prosperity and happiness might change with age. Employees over 48 years are the most sensitive group to income changes. The other two material prosperity indicators incorporate also psychological aspect. They represent certain security in the life and therefore their impact is more stable than the pure income effect. The analysis also reveals that relative income might be at least as important as the absolute level of income. This suggests that people tend to compare themselves with their neighbors as also Easterlin (1973) assumes.

Further, I apply a two-stage WLS regression analysis to identify the correlates of happiness within the countries. The results indicate that high income inequality and good weather, that might represent the differences in cultural and social differences between northern and southern European countries, significantly decreases subjective well-being. Example might be the Scandinavian countries where the average happiness is highest and Gini coeficient lowest, which means the highest income equality. Erasing the highest income inequality efect of Serbia would increase the average level of happiness in the country by at least 2.4 and at most by almost 4.

The results can be understood in two ways. Either the income equalization, or change of people‘s mind would significantly improve the average subjective well-being. The income inequality explains the so called Easterlin paradox referring to relatively stable subjective well-being levels and increasing income (GDP) over time, although these two seem to be correlated at one point in time. Because if only the rich are getting richer, income inequality rises and happiness remains on previous level or even decreases.

The issue of happiness is, however, complicated and influenced by various factors. To the most influential belong social relationships and the living environment. Having a good friend brings higher satisfaction approximately by 56 percentage points of its standard deviation (by 1). The social effect on subjective well-being is worth further research. Maybe it is time to remind the origins of utility theory by antique philosophers and to incorporate the social aspects such as friendship or morality into the economic equations that maximize utility.

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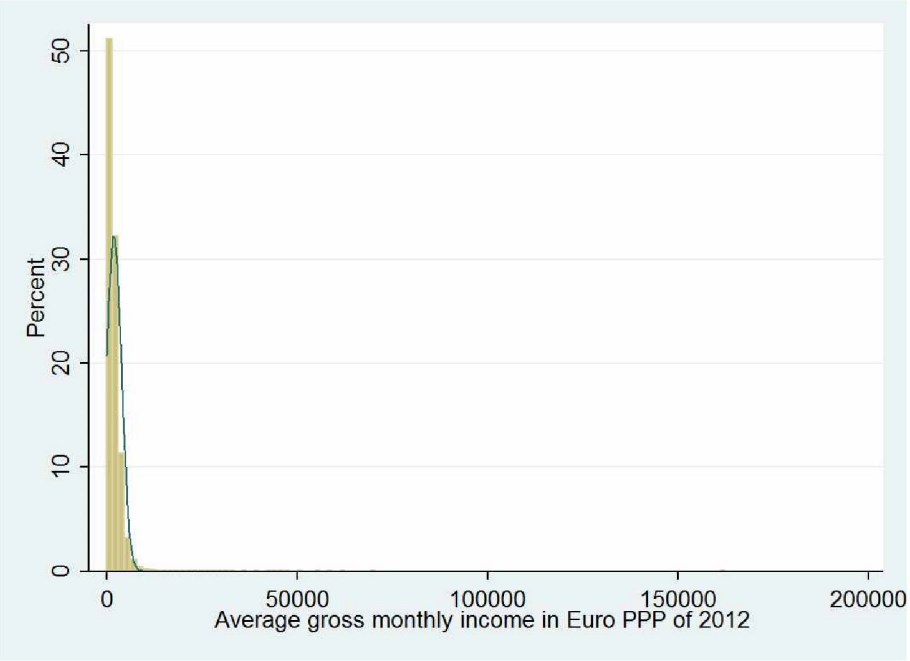
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Appendix A

Further description of data

Figure A.1: The distribution of gross monthly income and normal density estimate



Source: Data about employees form EU-SILC 2013 weighted by the sample weights.

Table A.1: EU-SILC 2013 Number of Regions reported by country

Country	#	Country	#	Country	#
Austria	3	Belgique	3	Bulgaria	2
Switzerland	1	Cyprus	1	Czech Republic	13
Germany	0	Denmark	1	Estonia	1
Greece	4	Spain	19	Finland	4
France	22	Croatia	1	Hungary	3
Ireland	1	Iceland	1	Italy	5
Lithuania	1	Luxembourg	1	Latvia	1
Malta	1	Netherlands	0	Norway	1
Poland	6	Portugal	0	Romania	4
Serbia	0	Sweden	1	Slovenia	0
Slovakia	1	United Kingdom	12		

Appendix B

Additional Results on Life satisfaction

Table B.1: The impact of material prosperity on life satisfaction

Response variable life satisfaction	OLS	Oprobit	Ologit
lg_income	0.0586^{**}	0.0327^{**}	0.0563^{**}
	(0.0226)	(0.0134)	(0.0248)
hour_worked	-0.00389^{*}	-0.00209^{*}	-0.00345
	(0.00202)	(0.00116)	(0.00212)
underemployed	-0.379^{***}	-0.213^{***}	-0.391^{***}
	(0.0440)	(0.0289)	(0.0468)
want_nmh	0.335^{***}	0.224^{***}	0.393^{***}
	(0.0479)	(0.0311)	(0.0572)
housework	0.266^{***}	0.191^{***}	0.344^{***}
	(0.0701)	(0.0472)	(0.0870)
other_reason	0.0227	0.0253	0.0613
	(0.0451)	(0.0293)	(0.0587)
elementary_work	-0.127^{***}	-0.0724^{***}	-0.145^{***}
	(0.0361)	(0.0172)	(0.0309)
payunexp	0.601^{***}	0.369^{***}	0.666^{***}
	(0.0453)	(0.0279)	(0.0500)
paymeat	0.724^{***}	0.383^{***}	0.697^{***}
	(0.151)	(0.0781)	(0.145)
bad_living	-0.206^{***}	-0.139^{***}	-0.244^{***}
	(0.0406)	(0.0261)	(0.0434)
crime	-0.394^{***}	-0.245^{***}	-0.417^{***}
	(0.0333)	(0.0170)	(0.0306)

Response variable life satisfaction	OLS	Oprobit	Ologit
age	−0.0972***	−0.0637***	−0.110***
	(0.00841)	(0.00582)	(0.0119)
age_sq	0.000947***	0.000625***	0.00108***
	(0.0000930)	(0.0000633)	(0.000127)
married	0.349***	0.237***	0.418***
	(0.0272)	(0.0166)	(0.0295)
female	0.0683**	0.0471***	0.0808**
	(0.0277)	(0.0181)	(0.0333)
child	0.00659	−0.000653	−0.00324
	(0.0242)	(0.0161)	(0.0279)
female_child	−0.0859**	−0.0509**	−0.0905**
	(0.0393)	(0.0233)	(0.0394)
widow	−0.278***	−0.150***	−0.290***
	(0.0413)	(0.0251)	(0.0445)
friend	0.986***	0.551***	0.979***
	(0.127)	(0.0721)	(0.128)
health_limit	−0.489***	−0.298***	−0.524***
	(0.0713)	(0.0448)	(0.0784)
primary	−0.242*	−0.124*	−0.239*
	(0.141)	(0.0734)	(0.132)
tertiary	0.138***	0.0823***	0.150***
	(0.0350)	(0.0238)	(0.0417)
temp_job	−0.154***	−0.0940***	−0.166***
	(0.0441)	(0.0269)	(0.0502)
manager	0.142***	0.0933***	0.161***
	(0.0376)	(0.0233)	(0.0417)
own	0.101**	0.0677**	0.129**
	(0.0492)	(0.0292)	(0.0546)
_cons	7.124***		
	(0.318)		
N	142,112	142,112	142,112
R^2	0.163		
pseudo R^2		0.043	0.044

Source: The data comes from EU-SILC 2013, contains only records of employees reporting their life satisfaction, and are weighted by the sample weights.
Notes: Standard errors in parentheses clustered at country-level. ***, **, and * denote statistical significance at the 1 %, 5 %, and 10 % level.

Table B.2: The impact of material prosperity on happiness in detail: OLS

	OLS_both	OLS_payunexp	OLS_paymeat
lg_income	0.0671***	0.0515***	0.0624***
	(0.00713)	(0.00716)	(0.00684)
hour_worked	−0.00340***	−0.00336***	−0.00340***
	(0.00113)	(0.000896)	(0.00108)

underemployed	−0.436***	−0.364***	−0.408***
	(0.0338)	(0.0351)	(0.0385)
want_nmh	0.354***	0.281***	0.340***
	(0.0268)	(0.0272)	(0.0322)
housework	0.200***	0.180***	0.187***
	(0.0305)	(0.0283)	(0.0302)
other_reason	−0.0419	−0.0317	−0.0352
	(0.0301)	(0.0273)	(0.0312)
elementary_work	−0.178***	−0.111***	−0.138***
	(0.0378)	(0.0359)	(0.0325)
bad_living	−0.264***	−0.215***	−0.242***
	(0.0370)	(0.0373)	(0.0364)
crime	−0.398***	−0.345***	−0.377***
	(0.0258)	(0.0246)	(0.0258)
age	−0.0975***	−0.0925***	−0.0965***
	(0.00555)	(0.00588)	(0.00543)
age_sq	0.000970***	0.000899***	0.000958***
	(0.0000645)	(0.0000677)	(0.0000621)
married	0.404***	0.355***	0.388***
	(0.0177)	(0.0150)	(0.0165)
female	0.0542	0.0702**	0.0600*
	(0.0325)	(0.0293)	(0.0309)
child	−0.0469**	0.0200	−0.0293
	(0.0191)	(0.0185)	(0.0188)
female_child	−0.0418	−0.0601	−0.0526
	(0.0417)	(0.0381)	(0.0416)
widow	−0.259***	−0.253***	−0.260***
	(0.0408)	(0.0398)	(0.0403)
friend	1.070***	1.003***	1.019***
	(0.127)	(0.132)	(0.127)
health_limit	−0.616***	−0.563***	−0.592***
	(0.0603)	(0.0608)	(0.0597)
primary	−0.201**	−0.135*	−0.171*
	(0.0878)	(0.0784)	(0.0848)
tertiary	0.258***	0.157***	0.231***
	(0.0309)	(0.0286)	(0.0275)
temp_job	−0.222***	−0.183***	−0.210***
	(0.0184)	(0.0172)	(0.0179)
manager	0.184***	0.151***	0.174***
	(0.0236)	(0.0209)	(0.0224)
own	0.268***	0.148***	0.244***
	(0.0329)	(0.0322)	(0.0313)
Austria	−0.226***	−0.295***	−0.204***
	(0.0417)	(0.0387)	(0.0401)
Belgium	−0.517***	−0.554***	−0.506***
	(0.0460)	(0.0432)	(0.0438)
Bulgaria	−2.716***	−2.569***	−2.435***
	(0.0268)	(0.0297)	(0.0248)
Switzerland	−0.219***	−0.289***	−0.223***

	(0.0461)	(0.0419)	(0.0448)
Cyprus	-1.784^{***}	-1.666^{***}	-1.765^{***}
	(0.0406)	(0.0420)	(0.0390)
Czech Repbulic	-0.850^{***}	-0.831^{***}	-0.803^{***}
	(0.0119)	(0.0130)	(0.0102)
Germany	-0.707^{***}	-0.694^{***}	-0.680^{***}
	(0.0417)	(0.0392)	(0.0394)
Denmark	0.0861^{***}	0.0477^{*}	0.0754^{**}
	(0.0300)	(0.0272)	(0.0295)
Estonia	-1.446^{***}	-1.374^{***}	-1.414^{***}
	(0.0359)	(0.0346)	(0.0332)
Greece	-1.351^{***}	-1.327^{***}	-1.324^{***}
	(0.0416)	(0.0404)	(0.0390)
Spain	-0.875^{***}	-0.842^{***}	-0.879^{***}
	(0.0412)	(0.0416)	(0.0401)
Finland	0.0167	0.0304	0.0237
	(0.0464)	(0.0435)	(0.0443)
France	-0.833^{***}	-0.823^{***}	-0.808^{***}
	(0.0474)	(0.0452)	(0.0447)
Croatia	-1.219^{***}	-1.065^{***}	-1.194^{***}
	(0.0163)	(0.0218)	(0.0154)
Hungary	-1.294^{***}	-1.086^{***}	-1.125^{***}
	(0.0144)	(0.0185)	(0.0199)
Ireland	-0.723^{***}	-0.575^{***}	-0.704^{***}
	(0.0508)	(0.0520)	(0.0482)
Iceland	0	0	0
	(.)	(.)	(.)
Italy	-1.085^{***}	-1.058^{***}	-1.032^{***}
	(0.0414)	(0.0403)	(0.0379)
Lithuania	-1.174^{***}	-1.028^{***}	-1.084^{***}
	(0.0312)	(0.0329)	(0.0281)
Luxembourg	-0.635^{***}	-0.677^{***}	-0.639^{***}
	(0.0518)	(0.0485)	(0.0500)
Latvia	-1.227^{***}	-1.005^{***}	-1.124^{***}
	(0.0348)	(0.0367)	(0.0296)
Malta	-0.985^{***}	-1.021^{***}	-0.916^{***}
	(0.0400)	(0.0375)	(0.0376)
Netherlands	-0.354^{***}	-0.389^{***}	-0.356^{***}
	(0.0513)	(0.0473)	(0.0495)
Norway	-0.370^{***}	-0.465^{***}	-0.370^{***}
	(0.0272)	(0.0250)	(0.0263)
Poland	-0.545^{***}	-0.459^{***}	-0.495^{***}
	(0.0239)	(0.0259)	(0.0219)
Portugal	-1.379^{***}	-1.359^{***}	-1.401^{***}
	(0.0464)	(0.0453)	(0.0452)
Romania	-0.547^{***}	-0.483^{***}	-0.471^{***}
	(0.0229)	(0.0238)	(0.0204)
Serbia	-2.245^{***}	-2.268^{***}	-2.114^{***}
	(0.00983)	(0.00902)	(0.0160)

Sweden	-0.190^{***}	-0.283^{***}	-0.204^{***}
	(0.0260)	(0.0228)	(0.0257)
Slovenia	-0.885^{***}	-0.774^{***}	-0.852^{***}
	(0.0417)	(0.0436)	(0.0399)
Slovakia	-0.993^{***}	-0.940^{***}	-0.878^{***}
	(0.0331)	(0.0330)	(0.0288)
United Kingdom	-0.906^{***}	-0.833^{***}	-0.862^{***}
	(0.0444)	(0.0430)	(0.0416)
payunexp		0.634^{***}	
		(0.0343)	
paymeat			0.776^{***}
			(0.0623)
_cons	8.674^{***}	8.428^{***}	8.000^{***}
	(0.191)	(0.210)	(0.178)
N	142112	142112	142112
R^2	0.172	0.195	0.184
pseudo R^2			

Standard errors in parentheses

Note:

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table B.3: The impact of material prosperity on happiness – quantile regression

Life satisfaction	Q10d	Q25d	Q50d	Q75d	Q90d
lg_income	0.119***	0.0804***	0.0397***	0.0213**	0.0111
	(0.00968)	(0.00957)	(0.00683)	(0.00834)	(0.00819)
hour_worked	−0.00666***	−0.00428***	−0.00283***	−0.00263**	−0.00108
	(0.00181)	(0.00144)	(0.000886)	(0.00112)	(0.000842)
underemployed	−0.603***	−0.424***	−0.332***	−0.209***	−0.176***
	(0.116)	(0.0571)	(0.0601)	(0.0500)	(0.0304)
want_nmh	0.333***	0.311***	0.167***	0.240***	0.150***
	(0.120)	(0.0730)	(0.0500)	(0.0540)	(0.0273)
housework	0.143	0.239***	0.145***	0.128***	0.132***
	(0.0986)	(0.0524)	(0.0436)	(0.0396)	(0.0445)
other_reason	−0.0324	−0.0520	0.0151	0.0253	−0.0518
	(0.0789)	(0.0514)	(0.0472)	(0.0439)	(0.0365)
elementary_work	−0.189***	−0.102***	−0.101***	−0.0383	−0.0268
	(0.0592)	(0.0353)	(0.0209)	(0.0324)	(0.0250)
payunexp	0.921***	0.786***	0.528***	0.386***	0.231***
	(0.0294)	(0.0256)	(0.0186)	(0.0191)	(0.0138)
paymeat	0.865***	0.638***	0.550***	0.364***	0.343***
	(0.0797)	(0.0429)	(0.0338)	(0.0427)	(0.0268)
bad_living	−0.287***	−0.253***	−0.128***	−0.182***	−0.199***
	(0.0286)	(0.0203)	(0.0132)	(0.0176)	(0.0123)
crime	−0.507***	−0.389***	−0.189***	−0.269***	−0.238***
	(0.0409)	(0.0328)	(0.0189)	(0.0279)	(0.0153)
age	−0.111***	−0.0897***	−0.0672***	−0.0811***	−0.0769***
	(0.00873)	(0.00637)	(0.00442)	(0.00520)	(0.00368)
age_sq	0.00103***	0.000855***	0.000656***	0.000813***	0.000787***

	(0.000105)	(0.0000739)	(0.0000502)	(0.0000608)	(0.0000431)
married	0.376***	0.347***	0.259***	0.332***	0.328***
	(0.0322)	(0.0223)	(0.0141)	(0.0190)	(0.0140)
female	0.0700*	0.0542**	0.0688***	0.0717***	0.0472***
	(0.0372)	(0.0255)	(0.0175)	(0.0218)	(0.0152)
child	0.0673	0.0311	0.00822	−0.0107	−0.0100
	(0.0437)	(0.0290)	(0.0170)	(0.0245)	(0.0188)
female_child	−0.0773	−0.0466	−0.0423*	−0.0406	−0.0285
	(0.0516)	(0.0364)	(0.0229)	(0.0306)	(0.0226)
widow	−0.405**	−0.338***	−0.324***	−0.236***	−0.00370
	(0.165)	(0.0718)	(0.0460)	(0.0651)	(0.0464)
friend	1.517***	1.188***	0.954***	0.625***	0.595***
	(0.106)	(0.0594)	(0.0427)	(0.0519)	(0.0173)
health_limit	−0.827***	−0.685***	−0.446***	−0.411***	−0.352***
	(0.0462)	(0.0329)	(0.0271)	(0.0219)	(0.0134)
primary	−0.151	−0.194***	−0.139***	−0.0000609	0.126
	(0.108)	(0.0604)	(0.0445)	(0.0659)	(0.144)
tertiary	0.281***	0.207***	0.106***	0.0755***	−0.0501***
	(0.0281)	(0.0194)	(0.0121)	(0.0163)	(0.0120)
temp_job	−0.325***	−0.176***	−0.152***	−0.118***	−0.0819***
	(0.0406)	(0.0321)	(0.0238)	(0.0240)	(0.0151)
manager	0.203***	0.183***	0.111***	0.110***	0.0649***
	(0.0328)	(0.0211)	(0.0128)	(0.0171)	(0.0137)
own	0.146***	0.182***	0.125***	0.133***	0.0828***
	(0.0320)	(0.0220)	(0.0151)	(0.0192)	(0.0130)
Austria	0.737***	0.694***	0.474***	0.430***	0.190***
	(0.0668)	(0.0459)	(0.0339)	(0.0448)	(0.0158)
Belgique	0.893***	0.560***	0.136***	−0.132***	−0.594***
	(0.0627)	(0.0423)	(0.0211)	(0.0344)	(0.0188)

Bulgaria	-1.732^{***}	-1.824^{***}	-1.787^{***}	-1.404^{***}	-1.373^{***}
	(0.0837)	(0.0675)	(0.0384)	(0.0910)	(0.0588)
Schwitzerland	0.813^{***}	0.679^{***}	0.382^{***}	0.320^{***}	0.202^{***}
	(0.0680)	(0.0440)	(0.0263)	(0.0365)	(0.0163)
Cyprus	-1.401^{***}	-1.086^{***}	-0.723^{***}	-0.598^{***}	-0.617^{***}
	(0.0892)	(0.0683)	(0.0531)	(0.0412)	(0.0391)
Czech Rep.	0.230^{***}	0.0705	0.0829^{**}	-0.0401	-0.300^{***}
	(0.0789)	(0.0630)	(0.0406)	(0.0543)	(0.0774)
Germany	0.289^{***}	0.284^{***}	0.144^{***}	0.0435	-0.317^{***}
	(0.0659)	(0.0472)	(0.0246)	(0.0286)	(0.0420)
Denmark	1.411^{***}	1.100^{***}	0.812^{***}	0.592^{***}	0.257^{***}
	(0.0852)	(0.0550)	(0.0483)	(0.0490)	(0.0258)
Estonia	-0.551^{***}	-0.635^{***}	-0.563^{***}	-0.612^{***}	-0.735^{***}
	(0.0727)	(0.0640)	(0.0446)	(0.0345)	(0.0288)
Greece	-0.813^{***}	-0.597^{***}	-0.395^{***}	-0.426^{***}	-0.609^{***}
	(0.0762)	(0.0765)	(0.0622)	(0.0506)	(0.0172)
Spain	0.0661	-0.0435	-0.0285	-0.138^{***}	-0.149^{*}
	(0.0694)	(0.0460)	(0.0243)	(0.0373)	(0.0868)
Finland	1.599^{***}	1.118^{***}	0.802^{***}	0.385^{***}	-0.178^{***}
	(0.0612)	(0.0479)	(0.0261)	(0.0301)	(0.0299)
France	0.326^{***}	0.101^{**}	-0.0150	-0.276^{***}	-0.502^{***}
	(0.0608)	(0.0512)	(0.0246)	(0.0394)	(0.0408)
Croatia	-0.280^{*}	-0.119	-0.136^{**}	-0.275^{***}	-0.321^{*}
	(0.155)	(0.0959)	(0.0579)	(0.0880)	(0.184)
Hungary	0.338^{***}	0.0282	-0.171^{***}	-0.358^{***}	-0.707^{***}
	(0.105)	(0.0832)	(0.0544)	(0.0637)	(0.0593)
Ireland	0.324^{***}	0.328^{***}	0.205^{***}	0.165^{**}	0.0639^{***}
	(0.0668)	(0.0591)	(0.0504)	(0.0684)	(0.0182)
Iceland	1.429^{***}	1.061^{***}	0.704^{***}	0.574^{***}	0.272^{***}

	(0.100)	(0.0757)	(0.0616)	(0.0962)	(0.0546)
Italia	0.00160	-0.136^{***}	-0.218^{***}	-0.397^{***}	-0.517^{***}
	(0.0675)	(0.0462)	(0.0312)	(0.0386)	(0.0580)
Lihuania	-0.132	-0.137^{**}	-0.0264	-0.108^{*}	-0.275^{**}
	(0.123)	(0.0609)	(0.0416)	(0.0559)	(0.113)
Luxembourg	0.343^{***}	0.297^{***}	0.110^{***}	-0.0417	-0.0555^{*}
	(0.0893)	(0.0625)	(0.0328)	(0.0463)	(0.0327)
Latvia	0.213^{***}	-0.0609	-0.207^{***}	-0.355^{***}	-0.579^{***}
	(0.0656)	(0.0508)	(0.0385)	(0.0390)	(0.0396)
Malta	-0.193^{*}	-0.203^{***}	-0.0510	-0.105	-0.0214
	(0.114)	(0.0633)	(0.0339)	(0.0692)	(0.0395)
Netherlands	1.102^{***}	0.731^{***}	0.240^{***}	0.0312	-0.412^{***}
	(0.0724)	(0.0434)	(0.0259)	(0.0351)	(0.0567)
Norway	0.642^{***}	0.501^{***}	0.233^{***}	0.198^{***}	0.101^{***}
	(0.0648)	(0.0591)	(0.0296)	(0.0416)	(0.0242)
Poland	0.451^{***}	0.431^{***}	0.367^{***}	0.303^{***}	0.137^{***}
	(0.0709)	(0.0617)	(0.0406)	(0.0382)	(0.0232)
Portugal	-0.882^{***}	-0.785^{***}	-0.499^{***}	-0.483^{***}	-0.411^{***}
	(0.0899)	(0.0660)	(0.0718)	(0.0436)	(0.101)
Romania	0.938^{***}	0.756^{***}	0.297^{***}	0.105^{**}	-0.425^{***}
	(0.0782)	(0.0635)	(0.0330)	(0.0475)	(0.0604)
Serbia	-1.392^{***}	-1.563^{***}	-1.534^{***}	-1.039^{***}	-1.362^{***}
	(0.0974)	(0.0743)	(0.0673)	(0.0767)	(0.0772)
Sweden	1.006^{***}	0.752^{***}	0.363^{***}	0.247^{***}	0.141^{***}
	(0.0610)	(0.0534)	(0.0361)	(0.0445)	(0.0254)
Slovenia	0.201	0.0990	0.0272	-0.0713	-0.0198
	(0.123)	(0.0647)	(0.0324)	(0.0565)	(0.0866)
Slovakia	-0.293^{***}	-0.156^{***}	0.0641^{**}	0.148^{***}	0.0991^{***}
	(0.0905)	(0.0502)	(0.0285)	(0.0332)	(0.0181)

United Kingdom	0	0	0	0	0
	(.)	(.)	(.)	(.)	(.)
_cons	4.041***	5.497***	6.868***	8.860***	10.07***
	(0.235)	(0.172)	(0.122)	(0.143)	(0.110)
N	142,112	142,112	142,112	142,112	142,112
pseudo R^2	0.145	0.162	0.088	0.076	0.055

Source: The data comes from EU-SILC 2013, contains only records of employees reporting their life satisfaction, and are weighted by the sample weights.
Notes: Standard errors in parentheses clustered at country-level. ***, **, and * denote statistical significance at the 1 %, 5 %, and 10 % level.

Table B.4: The impact of age on life satisfaction

Response variable	OLS	OProbit	Ologit
life satisfaction			
lg_income	0.0459***	0.0266***	0.0480***
	(0.00743)	(0.00452)	(0.00799)
hour_worked	−0.00338***	−0.00214***	−0.00389***
	(0.000893)	(0.000566)	(0.000941)
underemployed	−0.354***	−0.204***	−0.370***
	(0.0390)	(0.0260)	(0.0419)
want_nmh	0.272***	0.180***	0.316***
	(0.0310)	(0.0195)	(0.0365)
housework	0.167***	0.121***	0.215***
	(0.0288)	(0.0192)	(0.0352)
other_reason	−0.0242	−0.00907	0.000194
	(0.0269)	(0.0147)	(0.0282)
elementary_work	−0.0930***	−0.0493***	−0.0962***
	(0.0321)	(0.0177)	(0.0346)
payunexp	0.567***	0.356***	0.645***
	(0.0340)	(0.0205)	(0.0367)
paymeat	0.569***	0.300***	0.553***
	(0.0641)	(0.0388)	(0.0751)
bad_living	−0.204***	−0.140***	−0.248***
	(0.0368)	(0.0247)	(0.0408)
crime	−0.336***	−0.212***	−0.362***
	(0.0239)	(0.0156)	(0.0268)
age15_25	0.0420	−0.0127	0.00195
	(0.0986)	(0.0789)	(0.155)
age26_36	−0.309***	−0.238***	−0.382**
	(0.102)	(0.0779)	(0.149)
age37_47	−0.562***	−0.405***	−0.678***
	(0.0929)	(0.0708)	(0.132)
age48_58	−0.687***	−0.483***	−0.816***
	(0.0976)	(0.0713)	(0.133)
age59_69	−0.564***	−0.396***	−0.661***
	(0.116)	(0.0833)	(0.141)
age70	0	0	0
	(.)	(.)	(.)
married	0.333***	0.229***	0.399***
	(0.0139)	(0.00711)	(0.0114)
female	0.0734**	0.0516***	0.0909***
	(0.0282)	(0.0186)	(0.0326)
child	0.00635	0.000850	0.00159
	(0.0170)	(0.0122)	(0.0193)
female_child	−0.0708*	−0.0435*	−0.0749*
	(0.0392)	(0.0242)	(0.0389)
widow	−0.268***	−0.151***	−0.294***
	(0.0406)	(0.0238)	(0.0442)
friend	0.978***	0.560***	1.003***

	(0.132)	(0.0774)	(0.140)
health_limit	−0.557***	−0.348***	−0.614***
	(0.0602)	(0.0369)	(0.0633)
primary	−0.123	−0.0494	−0.105
	(0.0781)	(0.0396)	(0.0704)
tertiary	0.144***	0.0882***	0.164***
	(0.0286)	(0.0202)	(0.0345)
temp_job	−0.157***	−0.0952***	−0.166***
	(0.0203)	(0.0130)	(0.0223)
manager	0.142***	0.0960***	0.172***
	(0.0203)	(0.0123)	(0.0196)
own	0.143***	0.0978***	0.184***
	(0.0295)	(0.0167)	(0.0294)
Austria	−0.249***	0.386***	0.699***
	(0.0374)	(0.0100)	(0.0213)
Belgique	−0.527***	0.121***	0.224***
	(0.0417)	(0.00369)	(0.00634)
Bulgaria	−2.370***	−0.923***	−1.719***
	(0.0277)	(0.0172)	(0.0440)
Schwitzerland	−0.262***	0.359***	0.625***
	(0.0415)	(0.00672)	(0.0149)
Cyprus	−1.650***	−0.519***	−0.889***
	(0.0414)	(0.0122)	(0.0271)
Czech Rep.	−0.802***	−0.0345	−0.0531
	(0.0101)	(0.0220)	(0.0398)
Germany	−0.661***	0.0696***	0.167***
	(0.0379)	(0.00658)	(0.0114)
Denmark	0.0494*	0.584***	1.058***
	(0.0269)	(0.0167)	(0.0342)
Estonia	−1.346***	−0.386***	−0.703***
	(0.0340)	(0.0103)	(0.0228)
Greece	−1.303***	−0.330***	−0.564***
	(0.0385)	(0.0131)	(0.0231)
Spain	−0.847***	−0.0679***	−0.134***
	(0.0402)	(0.00673)	(0.0145)
Finland	0.0468	0.549***	0.986***
	(0.0429)	(0.0100)	(0.0236)
France	−0.795***	−0.0511***	−0.0927***
	(0.0430)	(0.00544)	(0.0109)
Croatia	−1.057***	−0.169***	−0.260***
	(0.0206)	(0.0164)	(0.0303)
Hungary	−0.999***	−0.164***	−0.281***
	(0.0210)	(0.0312)	(0.0576)
Ireland	−0.562***	0.146***	0.278***
	(0.0499)	(0.00648)	(0.0132)
Iceland	0	0.531***	0.944***
	(.)	(0.0290)	(0.0522)
Italia	−1.020***	−0.180***	−0.324***

	(0.0377)	(0.0108)	(0.0214)
Lihuania	−0.960***	−0.114***	−0.157***
	(0.0316)	(0.00831)	(0.0154)
Luxembourg	−0.661***	0.0679***	0.131***
	(0.0467)	(0.00945)	(0.0160)
Latvia	−0.942***	−0.140***	−0.239***
	(0.0342)	(0.0111)	(0.0232)
Malta	−0.942***	−0.105***	−0.177***
	(0.0356)	(0.00865)	(0.0143)
Netherlands	−0.372***	0.241***	0.438***
	(0.0461)	(0.00385)	(0.00925)
Norway	−0.449***	0.225***	0.393***
	(0.0235)	(0.0153)	(0.0275)
Poland	−0.426***	0.235***	0.447***
	(0.0240)	(0.0153)	(0.0283)
Portugal	−1.370***	−0.358***	−0.655***
	(0.0452)	(0.0188)	(0.0369)
Romania	−0.435***	0.186***	0.382***
	(0.0213)	(0.0194)	(0.0340)
Serbia	−2.178***	−0.816***	−1.493***
	(0.0160)	(0.0279)	(0.0604)
Sweden	−0.283***	0.330***	0.582***
	(0.0219)	(0.0166)	(0.0303)
Slovenia	−0.768***	0.000323	0.00116
	(0.0408)	(0.00635)	(0.00982)
Slovakia	−0.850***	−0.0282**	−0.0281
	(0.0296)	(0.0124)	(0.0216)
United Kingdom	−0.788***	0	0
	(0.0421)	(.)	(.)
_cons	6.301***		
	(0.139)		
N	142,112	142,112	142,112
R^2	0.199		
pseudo R^2		0.054	0.056

Source: The data comes from EU-SILC 2013, contains only records of employees reporting their life satisfaction, and are weighted by the sample weights.
Notes: Standard errors in parentheses clustered at country-level. ***, **, and * denote statistical significance at the 1 %, 5 %, and 10 % level.

Table B.5: The impact of material prosperity on life satisfaction: Model extensions – OLS

	OLS - 2	OLS - 3	OLS - 4	OLS - 5
lg_income	0.0497***	−0.342**	−0.342**	
	(0.00714)	(0.126)	(0.126)	
income_diff		0.393***	0.393***	0.0511***
		(0.125)	(0.125)	(0.00689)

hour_worked	−0.00336***	−0.00326***	−0.00326***	−0.00337***
	(0.000890)	(0.000913)	(0.000913)	(0.000887)
underemployed	−0.351***	−0.351***	−0.351***	−0.350***
	(0.0384)	(0.0389)	(0.0389)	(0.0383)
want_nmh	0.279***	0.278***	0.278***	0.280***
	(0.0309)	(0.0297)	(0.0297)	(0.0308)
housework	0.173***	0.175***	0.175***	0.174***
	(0.0284)	(0.0282)	(0.0282)	(0.0282)
other_reason	−0.0278	−0.0235	−0.0235	−0.0265
	(0.0268)	(0.0261)	(0.0261)	(0.0267)
elementary_work	−0.0889**	−0.0913***	−0.0913***	−0.0889**
	(0.0327)	(0.0330)	(0.0330)	(0.0326)
payunexp	0.565***	0.568***	0.568***	0.565***
	(0.0344)	(0.0344)	(0.0344)	(0.0344)
paymeat	0.569***	0.569***	0.569***	0.569***
	(0.0645)	(0.0639)	(0.0639)	(0.0644)
bad_living	−0.205***	−0.205***	−0.205***	−0.205***
	(0.0370)	(0.0367)	(0.0367)	(0.0370)
crime	−0.335***	−0.331***	−0.331***	−0.335***
	(0.0243)	(0.0240)	(0.0240)	(0.0243)
age	−0.0924***	−0.0922***	−0.0922***	−0.0925***
	(0.00568)	(0.00555)	(0.00555)	(0.00569)
age_sq	0.000898***	0.000896***	0.000896***	0.000899***
	(0.0000647)	(0.0000637)	(0.0000637)	(0.0000649)
married	0.349***	0.348***	0.348***	0.349***
	(0.0144)	(0.0142)	(0.0142)	(0.0144)
female	0.0727**	0.0732**	0.0732**	0.0729**
	(0.0285)	(0.0282)	(0.0282)	(0.0285)
child	0.0256	0.0237	0.0237	0.0252
	(0.0191)	(0.0187)	(0.0187)	(0.0191)
female_child	−0.0661*	−0.0645*	−0.0645*	−0.0656*
	(0.0385)	(0.0380)	(0.0380)	(0.0384)
widow	−0.255***	−0.255***	−0.255***	−0.255***
	(0.0396)	(0.0395)	(0.0395)	(0.0396)
friend	0.973***	0.974***	0.974***	0.973***
	(0.132)	(0.131)	(0.131)	(0.132)
health_limit	−0.551***	−0.551***	−0.551***	−0.551***
	(0.0604)	(0.0604)	(0.0604)	(0.0604)
primary	−0.121	−0.120	−0.120	−0.120
	(0.0778)	(0.0793)	(0.0793)	(0.0780)
tertiary	0.148***	0.151***	0.151***	0.148***
	(0.0270)	(0.0260)	(0.0260)	(0.0270)
temp_job	−0.179***	−0.182***	−0.182***	−0.178***
	(0.0172)	(0.0180)	(0.0180)	(0.0170)
manager	0.147***	0.147***	0.147***	0.147***
	(0.0205)	(0.0205)	(0.0205)	(0.0206)
own	0.144***	0.140***	0.140***	0.143***
	(0.0313)	(0.0306)	(0.0306)	(0.0312)

curtain	-0.762^{***}		1.124^{*}	-0.523^{***}
	(0.0430)		(0.608)	(0.0130)
Austria	-0.271^{***}	1.743^{**}	1.743^{**}	-0.0149^{**}
	(0.0374)	(0.651)	(0.651)	(0.00698)
Belgique	-0.542^{***}	1.512^{**}	1.512^{**}	-0.281^{***}
	(0.0418)	(0.666)	(0.666)	(0.00905)
Bulgaria	-1.618^{***}	-1.116^{***}	-2.240^{***}	-1.697^{***}
	(0.0334)	(0.405)	(0.205)	(0.0268)
Schwitzerland	-0.285^{***}	1.767^{**}	1.767^{**}	-0.0243^{***}
	(0.0412)	(0.663)	(0.663)	(0.00784)
Cyprus	-1.665^{***}	0.210	0.210	-1.427^{***}
	(0.0416)	(0.602)	(0.602)	(0.0151)
Czech Rep.	-0.0360	-0.284^{*}	-1.408^{***}	-0.210^{***}
	(0.0344)	(0.162)	(0.446)	(0.0134)
Germany	-0.676^{***}	1.353^{**}	1.353^{**}	-0.418^{***}
	(0.0379)	(0.656)	(0.656)	(0.00900)
Denmark	0.0441	1.360^{***}	1.360^{***}	0.211^{***}
	(0.0271)	(0.425)	(0.425)	(0.00969)
Estonia	-0.596^{***}	0.316	-0.808^{***}	-0.623^{***}
	(0.0136)	(0.540)	(0.0690)	(0.0110)
Greece	-1.310^{***}	0.507	0.507	-1.079^{***}
	(0.0387)	(0.589)	(0.589)	(0.0177)
Spain	-0.848^{***}	1.019^{*}	1.019^{*}	-0.611^{***}
	(0.0413)	(0.600)	(0.600)	(0.0111)
Finland	0.0341	2.062^{***}	2.062^{***}	0.291^{***}
	(0.0427)	(0.656)	(0.656)	(0.0136)
France	-0.806^{***}	1.146^{*}	1.146^{*}	-0.558^{***}
	(0.0436)	(0.633)	(0.633)	(0.00975)
Croatia	-0.302^{***}	-0.153	-1.277^{***}	-0.426^{***}
	(0.0258)	(0.287)	(0.321)	(0.0122)
Hungary	-0.223^{***}	-1.567^{***}	-2.691^{***}	-0.536^{***}
	(0.0536)	(0.194)	(0.801)	(0.0185)
Ireland	-0.578^{***}	1.397^{**}	1.397^{**}	-0.328^{***}
	(0.0514)	(0.636)	(0.636)	(0.0183)
Iceland	0			0
	(.)			(.)
Italia	-1.021^{***}	0.927	0.927	-0.774^{***}
	(0.0379)	(0.631)	(0.631)	(0.00962)
Lihuania	-0.215^{***}	0.621	-0.503^{***}	-0.252^{***}
	(0.0157)	(0.513)	(0.0954)	(0.0118)
Luxembourg	-0.675^{***}	1.386^{**}	1.386^{**}	-0.414^{***}
	(0.0474)	(0.664)	(0.664)	(0.0178)
Latvia	-0.192^{***}	0.626	-0.498^{***}	-0.231^{***}
	(0.0179)	(0.508)	(0.101)	(0.0143)
Malta	-0.966^{***}	0.946	0.946	-0.724^{***}
	(0.0354)	(0.620)	(0.620)	(0.0144)
Netherlands	-0.387^{***}	1.686^{**}	1.686^{**}	-0.124^{***}
	(0.0465)	(0.674)	(0.674)	(0.0146)

Norway	-0.454^{***}	0.848^{*}	0.848^{*}	-0.289^{***}
	(0.0236)	(0.419)	(0.419)	(0.00801)
Poland	0.330^{***}	0.748^{*}	-0.376	0.241^{***}
	(0.0212)	(0.377)	(0.231)	(0.0108)
Portugal	-1.377^{***}	0.323	0.323	-1.162^{***}
	(0.0453)	(0.544)	(0.544)	(0.0258)
Romania	0.328^{***}	0.481	-0.643^{**}	0.205^{***}
	(0.0293)	(0.294)	(0.315)	(0.0143)
Serbia	-1.407^{***}	-2.398^{***}	-3.522^{***}	-1.675^{***}
	(0.0514)	(0.0771)	(0.684)	(0.0195)
Sweden	-0.283^{***}	0.867^{**}	0.867^{**}	-0.137^{***}
	(0.0222)	(0.369)	(0.369)	(0.00826)
Slovenia	0	1.124^{*}		0
	(.)	(0.608)		(.)
Slovakia	-0.0990^{***}	0.857	-0.267^{***}	-0.120^{***}
	(0.0177)	(0.553)	(0.0574)	(0.0153)
United Kingdom	-0.808^{***}	1.150^{*}	1.150^{*}	-0.560^{***}
	(0.0417)	(0.633)	(0.633)	(0.00933)
_cons	7.961^{***}	9.944^{***}	9.944^{***}	8.217^{***}
	(0.195)	(0.633)	(0.633)	(0.184)
N	142112	142112	142112	142112
R^2	0.201	0.202	0.202	0.201

Source: The data comes from EU-SILC 2013, contains only records of employees reporting their life satisfaction, and are weighted by the sample weights.

Notes: Standard errors in parentheses clustered at country-level. ***, **, and * denote statistical significance at the 1 %, 5 %, and 10 % level.

Table B.6: The impact of material prosperity on happiness: Model modifications – Ordered probit

	Oprobit2	Oprobit3	Oprobit4	Oprobit5
life satisfaction				
lg_income	0.0291***	−0.223***	−0.223***	
	(0.00429)	(0.0854)	(0.0854)	
income_diff		0.253***	0.253***	0.0300***
		(0.0842)	(0.0842)	(0.00414)
hour_worked	−0.00213***	−0.00207***	−0.00207***	−0.00214***
	(0.000561)	(0.000574)	(0.000574)	(0.000561)
underemployed	−0.202***	−0.202***	−0.202***	−0.201***
	(0.0255)	(0.0259)	(0.0259)	(0.0255)
want_nmh	0.185***	0.185***	0.185***	0.186***
	(0.0194)	(0.0186)	(0.0186)	(0.0194)
housework	0.125***	0.127***	0.127***	0.126***
	(0.0190)	(0.0190)	(0.0190)	(0.0189)
other_reason	−0.0113	−0.00852	−0.00852	−0.0105
	(0.0155)	(0.0147)	(0.0147)	(0.0153)
elementary_work	−0.0466***	−0.0481***	−0.0481***	−0.0466***
	(0.0180)	(0.0181)	(0.0181)	(0.0179)
payunexp	0.355***	0.358***	0.358***	0.355***
	(0.0207)	(0.0206)	(0.0206)	(0.0207)
paymeat	0.301***	0.301***	0.301***	0.301***
	(0.0394)	(0.0391)	(0.0391)	(0.0393)
bad_living	−0.140***	−0.140***	−0.140***	−0.140***
	(0.0248)	(0.0246)	(0.0246)	(0.0248)
crime	−0.212***	−0.209***	−0.209***	−0.212***
	(0.0157)	(0.0152)	(0.0152)	(0.0157)
age	−0.0609***	−0.0607***	−0.0607***	−0.0609***

	(0.00410)	(0.00401)	(0.00401)	(0.00411)
age_sq	0.000595***	0.000593***	0.000593***	0.000595***
	(0.0000450)	(0.0000443)	(0.0000443)	(0.0000451)
married	0.240***	0.239***	0.239***	0.240***
	(0.00693)	(0.00694)	(0.00694)	(0.00692)
female	0.0511***	0.0514***	0.0514***	0.0512***
	(0.0189)	(0.0187)	(0.0187)	(0.0189)
child	0.0130	0.0118	0.0118	0.0128
	(0.0136)	(0.0133)	(0.0133)	(0.0136)
female_child	−0.0404*	−0.0394*	−0.0394*	−0.0401*
	(0.0238)	(0.0235)	(0.0235)	(0.0238)
widow	−0.142***	−0.142***	−0.142***	−0.142***
	(0.0232)	(0.0231)	(0.0231)	(0.0232)
friend	0.557***	0.558***	0.558***	0.557***
	(0.0774)	(0.0772)	(0.0772)	(0.0774)
health_limit	−0.345***	−0.345***	−0.345***	−0.345***
	(0.0371)	(0.0372)	(0.0372)	(0.0371)
primary	−0.0479	−0.0474	−0.0474	−0.0476
	(0.0394)	(0.0404)	(0.0404)	(0.0395)
tertiary	0.0915***	0.0933***	0.0933***	0.0914***
	(0.0191)	(0.0185)	(0.0185)	(0.0191)
temp_job	−0.109***	−0.111***	−0.111***	−0.109***
	(0.0113)	(0.0119)	(0.0119)	(0.0111)
manager	0.0992***	0.0994***	0.0994***	0.0991***
	(0.0122)	(0.0121)	(0.0121)	(0.0122)
own	0.0979***	0.0955***	0.0955***	0.0975***
	(0.0180)	(0.0176)	(0.0176)	(0.0179)
curtain	−0.0218*		−0.176***	−0.0395***
	(0.0117)		(0.0534)	(0.00961)

Austria	0.386***	0.422***	0.422***	0.390***
	(0.00976)	(0.0153)	(0.0153)	(0.0101)
Belgique	0.125***	0.187***	0.187***	0.132***
	(0.00430)	(0.0200)	(0.0200)	(0.00461)
Bulgaria	−0.895***	−1.364***	−1.188***	−0.929***
	(0.0108)	(0.148)	(0.0959)	(0.0122)
Schwitzerland	0.358***	0.418***	0.418***	0.365***
	(0.00670)	(0.0200)	(0.0200)	(0.00733)
Cyprus	−0.516***	−0.570***	−0.570***	−0.522***
	(0.0120)	(0.0206)	(0.0206)	(0.0123)
Czech Rep.	0.00329	−0.948***	−0.772***	−0.0864***
	(0.0117)	(0.316)	(0.263)	(0.00693)
Germany	0.0733***	0.119***	0.119***	0.0788***
	(0.00576)	(0.0173)	(0.0173)	(0.00612)
Denmark	0.595***	0.182	0.182	0.548***
	(0.0154)	(0.144)	(0.144)	(0.00970)
Estonia	−0.359***	−0.564***	−0.388***	−0.362***
	(0.00974)	(0.0599)	(0.0116)	(0.0101)
Greece	−0.321***	−0.412***	−0.412***	−0.331***
	(0.0122)	(0.0283)	(0.0283)	(0.0122)
Spain	−0.0555***	−0.114***	−0.114***	−0.0621***
	(0.00649)	(0.0213)	(0.0213)	(0.00661)
Finland	0.555***	0.600***	0.600***	0.560***
	(0.00946)	(0.0140)	(0.0140)	(0.00987)
France	−0.0444***	−0.0483***	−0.0483***	−0.0449***
	(0.00558)	(0.00517)	(0.00517)	(0.00561)
Croatia	−0.138***	−0.834***	−0.658***	−0.198***
	(0.00859)	(0.231)	(0.179)	(0.00982)
Hungary	−0.120***	−1.777***	−1.601***	−0.291***

	(0.0203)	(0.555)	(0.503)	(0.0108)
Ireland	0.149***	0.160***	0.160***	0.150***
	(0.00826)	(0.00797)	(0.00797)	(0.00816)
Iceland	0.546***	−0.715*	−0.715*	0.400***
	(0.0285)	(0.429)	(0.429)	(0.00851)
Italia	−0.167***	−0.174***	−0.174***	−0.168***
	(0.0101)	(0.00980)	(0.00980)	(0.0101)
Lihuania	−0.0903***	−0.344***	−0.167***	−0.0992***
	(0.00525)	(0.0799)	(0.0278)	(0.00612)
Luxembourg	0.0718***	0.138***	0.138***	0.0796***
	(0.00868)	(0.0234)	(0.0234)	(0.00853)
Latvia	−0.112***	−0.377***	−0.201***	−0.122***
	(0.00641)	(0.0825)	(0.0304)	(0.00750)
Malta	−0.107***	−0.137***	−0.137***	−0.111***
	(0.00838)	(0.0108)	(0.0108)	(0.00813)
Netherlands	0.246***	0.320***	0.320***	0.255***
	(0.00369)	(0.0245)	(0.0245)	(0.00348)
Norway	0.235***	−0.187	−0.187	0.187***
	(0.0147)	(0.146)	(0.146)	(0.00830)
Poland	0.267***	−0.256	−0.0796	0.227***
	(0.00609)	(0.171)	(0.119)	(0.00481)
Portugal	−0.349***	−0.515***	−0.515***	−0.369***
	(0.0182)	(0.0568)	(0.0568)	(0.0187)
Romania	0.223***	−0.471**	−0.295*	0.163***
	(0.00942)	(0.231)	(0.179)	(0.00629)
Serbia	−0.776***	−2.206***	−2.030***	−0.921***
	(0.0165)	(0.472)	(0.420)	(0.0120)
Sweden	0.344***	−0.177	−0.177	0.284***
	(0.0157)	(0.180)	(0.180)	(0.00762)

Slovenia	0.0396^{***}	-0.0284^{*}	0.148^{***}	0.0521^{***}
	(0.0129)	(0.0162)	(0.0388)	(0.0114)
Slovakia	0	-0.176^{***}	0	0
	(.)	(0.0534)	(.)	(.)
United Kingdom	0	0	0	0
	(.)	(.)	(.)	(.)
N	142112	142112	142112	142112
R^2				

Source: The data comes from EU-SILC 2013, contains only records of employees reporting their life satisfaction, and are weighted by the sample weights.
Notes: Standard errors in parentheses clustered at country-level. ***, **, and * denote statistical significance at the 1 %, 5 %, and 10 % level.

Table B.7: The impact of material prosperity on happiness: Model modifications – Ologit

	Ologit2	Ologit3	Ologit4	Ologit5
life satisfactions				
lg_income	0.0528***	−0.371***	−0.371***	
	(0.00751)	(0.143)	(0.143)	
income_diff		0.425***	0.425***	0.0544***
		(0.142)	(0.142)	(0.00728)
hour_worked	−0.00390***	−0.00379***	−0.00379***	−0.00391***
	(0.000942)	(0.000966)	(0.000966)	(0.000943)
underemployed	−0.368***	−0.368***	−0.368***	−0.367***
	(0.0414)	(0.0421)	(0.0421)	(0.0412)
want_nmh	0.325***	0.324***	0.324***	0.325***
	(0.0363)	(0.0351)	(0.0351)	(0.0363)
housework	0.225***	0.228***	0.228***	0.226***
	(0.0339)	(0.0336)	(0.0336)	(0.0337)
other_reason	−0.00388	0.00148	0.00148	−0.00237
	(0.0306)	(0.0287)	(0.0287)	(0.0302)
elementary_work	−0.0914***	−0.0943***	−0.0943***	−0.0914***
	(0.0348)	(0.0350)	(0.0350)	(0.0347)
payunexp	0.642***	0.646***	0.646***	0.642***
	(0.0371)	(0.0368)	(0.0368)	(0.0371)
paymeat	0.554***	0.554***	0.554***	0.554***
	(0.0759)	(0.0750)	(0.0750)	(0.0758)
bad_living	−0.248***	−0.248***	−0.248***	−0.248***
	(0.0409)	(0.0405)	(0.0405)	(0.0408)
crime	−0.362***	−0.357***	−0.357***	−0.362***
	(0.0271)	(0.0261)	(0.0261)	(0.0271)
age	−0.106***	−0.105***	−0.105***	−0.106***

	(0.00883)	(0.00867)	(0.00867)	(0.00884)
age_sq	0.00103***	0.00103***	0.00103***	0.00103***
	(0.0000937)	(0.0000922)	(0.0000922)	(0.0000939)
married	0.416***	0.415***	0.415***	0.416***
	(0.0112)	(0.0112)	(0.0112)	(0.0112)
female	0.0895***	0.0903***	0.0903***	0.0898***
	(0.0335)	(0.0332)	(0.0332)	(0.0334)
child	0.0220	0.0200	0.0200	0.0217
	(0.0220)	(0.0214)	(0.0214)	(0.0219)
female_child	−0.0695*	−0.0682*	−0.0682*	−0.0691*
	(0.0387)	(0.0381)	(0.0381)	(0.0385)
widow	−0.278***	−0.278***	−0.278***	−0.278***
	(0.0430)	(0.0430)	(0.0430)	(0.0430)
friend	0.999***	1.000***	1.000***	0.999***
	(0.141)	(0.140)	(0.140)	(0.140)
health_limit	−0.609***	−0.609***	−0.609***	−0.609***
	(0.0637)	(0.0638)	(0.0638)	(0.0637)
primary	−0.100	−0.0989	−0.0989	−0.0995
	(0.0703)	(0.0722)	(0.0722)	(0.0706)
tertiary	0.171***	0.174***	0.174***	0.171***
	(0.0323)	(0.0311)	(0.0311)	(0.0323)
temp_job	−0.192***	−0.195***	−0.195***	−0.191***
	(0.0193)	(0.0202)	(0.0202)	(0.0190)
manager	0.177***	0.178***	0.178***	0.177***
	(0.0195)	(0.0195)	(0.0195)	(0.0196)
own	0.184***	0.180***	0.180***	0.183***
	(0.0321)	(0.0314)	(0.0314)	(0.0319)
curtain	−0.0155		−0.275***	−0.0476***
	(0.0201)		(0.0909)	(0.0164)

Austria	0.700***	0.760***	0.760***	0.708***
	(0.0212)	(0.0263)	(0.0263)	(0.0217)
Belgique	0.230***	0.334***	0.334***	0.244***
	(0.00661)	(0.0338)	(0.0338)	(0.00714)
Bulgaria	−1.690***	−2.456***	−2.182***	−1.751***
	(0.0299)	(0.242)	(0.152)	(0.0301)
Schwitzerland	0.623***	0.724***	0.724***	0.636***
	(0.0151)	(0.0322)	(0.0322)	(0.0160)
Cyprus	−0.882***	−0.972***	−0.972***	−0.893***
	(0.0269)	(0.0336)	(0.0336)	(0.0272)
Czech Rep.	−0.00707	−1.584***	−1.309***	−0.169***
	(0.0194)	(0.529)	(0.439)	(0.0107)
Germany	0.173***	0.250***	0.250***	0.183***
	(0.00960)	(0.0283)	(0.0283)	(0.0104)
Denmark	1.078***	0.383	0.383	0.992***
	(0.0318)	(0.245)	(0.245)	(0.0228)
Estonia	−0.677***	−1.001***	−0.726***	−0.684***
	(0.0203)	(0.0983)	(0.0194)	(0.0207)
Greece	−0.547***	−0.701***	−0.701***	−0.566***
	(0.0217)	(0.0460)	(0.0460)	(0.0217)
Spain	−0.112***	−0.209***	−0.209***	−0.124***
	(0.0142)	(0.0360)	(0.0360)	(0.0146)
Finland	0.996***	1.072***	1.072***	1.006***
	(0.0225)	(0.0259)	(0.0259)	(0.0231)
France	−0.0807***	−0.0873***	−0.0873***	−0.0815***
	(0.0108)	(0.00999)	(0.00999)	(0.0109)
Croatia	−0.226***	−1.374***	−1.099***	−0.335***
	(0.0123)	(0.386)	(0.296)	(0.0155)
Hungary	−0.223***	−2.985***	−2.710***	−0.533***

	(0.0348)	(0.927)	(0.838)	(0.0180)
Ireland	0.287***	0.304***	0.304***	0.289***
	(0.0162)	(0.0150)	(0.0150)	(0.0161)
Iceland	0.973***	−1.145	−1.145	0.709***
	(0.0509)	(0.722)	(0.722)	(0.0181)
Italia	−0.302***	−0.313***	−0.313***	−0.304***
	(0.0203)	(0.0193)	(0.0193)	(0.0202)
Lihuania	−0.135***	−0.539***	−0.265***	−0.151***
	(0.00741)	(0.133)	(0.0444)	(0.00934)
Luxembourg	0.138***	0.249***	0.249***	0.152***
	(0.0145)	(0.0392)	(0.0392)	(0.0142)
Latvia	−0.214***	−0.638***	−0.363***	−0.232***
	(0.0142)	(0.135)	(0.0460)	(0.0156)
Malta	−0.182***	−0.231***	−0.231***	−0.188***
	(0.0138)	(0.0172)	(0.0172)	(0.0133)
Netherlands	0.447***	0.571***	0.571***	0.462***
	(0.00851)	(0.0428)	(0.0428)	(0.00836)
Norway	0.414***	−0.296	−0.296	0.326***
	(0.0264)	(0.248)	(0.248)	(0.0157)
Poland	0.483***	−0.374	−0.0992	0.410***
	(0.0127)	(0.290)	(0.201)	(0.0108)
Portugal	−0.638***	−0.918***	−0.918***	−0.673***
	(0.0357)	(0.0915)	(0.0915)	(0.0363)
Romania	0.424***	−0.719*	−0.444	0.316***
	(0.0167)	(0.389)	(0.299)	(0.0132)
Serbia	−1.441***	−3.823***	−3.548***	−1.704***
	(0.0392)	(0.784)	(0.694)	(0.0289)
Sweden	0.608***	−0.266	−0.266	0.500***
	(0.0285)	(0.305)	(0.305)	(0.0151)

Slovenia	0.0488**	−0.0448*	0.230***	0.0713***
	(0.0242)	(0.0263)	(0.0678)	(0.0213)
Slovakia	0	−0.275***	0	0
	(.)	(0.0909)	(.)	(.)
United Kingdom	0	0	0	0
	(.)	(.)	(.)	(.)
N	142112	142112	142112	142112
R^2				

Source: The data comes from EU-SILC 2013, contains only records of employees reporting their life satisfaction, and are weighted by the sample weights.
Notes: Standard errors in parentheses clustered at country-level. ***, **, and * denote statistical significance at the 1 %, 5 %, and 10 % level.

Table B.8: The impact of income difference on happiness

Response variable life satisfacion	OLS	Oprobit	Ologit
income_diff	0.0437***	0.0244***	0.0434***
	(0.00822)	(0.00505)	(0.00936)
hour_worked	−0.00440**	−0.00237**	−0.00393*
	(0.00200)	(0.00114)	(0.00202)
underemployed	−0.373***	−0.209***	−0.385***
	(0.0433)	(0.0284)	(0.0450)
want_nmh	0.354***	0.234***	0.412***
	(0.0489)	(0.0314)	(0.0570)
housework	0.293***	0.205***	0.370***
	(0.0689)	(0.0461)	(0.0842)
other_reason	0.0211	0.0243	0.0623
	(0.0411)	(0.0269)	(0.0540)
elementary_work	−0.131***	−0.0746***	−0.148***
	(0.0386)	(0.0185)	(0.0329)
payunexp	0.624***	0.382***	0.688***
	(0.0497)	(0.0300)	(0.0540)
paymeat	0.759***	0.401***	0.729***
	(0.164)	(0.0846)	(0.158)
bad_living	−0.201***	−0.136***	−0.239***
	(0.0403)	(0.0260)	(0.0434)
crime	−0.389***	−0.242***	−0.411***
	(0.0330)	(0.0168)	(0.0301)
age	−0.0949***	−0.0623***	−0.108***
	(0.00807)	(0.00584)	(0.0120)
age_sq	0.000924***	0.000612***	0.00106***
	(0.0000900)	(0.0000633)	(0.000128)
married	0.341***	0.232***	0.409***
	(0.0267)	(0.0165)	(0.0293)
female	0.0658**	0.0457***	0.0784**
	(0.0270)	(0.0177)	(0.0327)
child	0.00598	−0.00103	−0.00371
	(0.0239)	(0.0159)	(0.0273)
female_child	−0.0983**	−0.0577**	−0.101**
	(0.0384)	(0.0230)	(0.0395)
widow	−0.295***	−0.159***	−0.307***
	(0.0413)	(0.0249)	(0.0423)
friend	0.974***	0.544***	0.967***
	(0.126)	(0.0713)	(0.126)
health_limit	−0.478***	−0.291***	−0.512***
	(0.0722)	(0.0453)	(0.0792)
primary	−0.228	−0.117	−0.226*
	(0.142)	(0.0741)	(0.133)
tertiary	0.146***	0.0867***	0.158***
	(0.0330)	(0.0221)	(0.0389)
temp_job	−0.167***	−0.101***	−0.176***

Response variable life satisfacion	OLS	Oprobit	Ologit
	(0.0359)	(0.0223)	(0.0410)
manager	0.165***	0.106***	0.183***
	(0.0382)	(0.0237)	(0.0426)
own	0.0717	0.0511	0.101*
	(0.0528)	(0.0315)	(0.0593)
_cons	7.624***		
	(0.245)		
N	142112	142112	142112
R^2	0.161		
pseudo R^2		0.042	0.043

Source: The data comes from EU-SILC 2013, contains only records of employees reporting their life satisfaction, and are weighted by the sample weights.

Notes: Standard errors in parentheses clustered at country-level. ***, **, and * denote statistical significance at the 1 %, 5 %, and 10 % level.

Table B.9: The impact of material prosperity on happiness: OLS Model Extensions

Response variable: life satisfaction	OLS	OLS-FE	OLS-2-FE	OLS-2	
lg_income	0.0533**	0.0414***	0.0414***	0.0398***	
	(0.0229)	(0.00423)	(0.00585)	(0.00267)	
hour_worked	−0.00457**	−0.00404***	−0.00404***	−0.00409***	−0.00492**
	(0.00203)	(0.000701)	(0.000770)	(0.000786)	(0.00198)
underemployed	−0.397***	−0.372***	−0.372***	−0.371***	−0.395***
	(0.0458)	(0.0418)	(0.0416)	(0.0418)	(0.0452)
want_nmh	0.391***	0.316***	0.316***	0.317***	0.404***
	(0.0529)	(0.0449)	(0.0433)	(0.0427)	(0.0534)
housework	0.256***	0.150***	0.150***	0.152***	0.278***
	(0.0683)	(0.0250)	(0.0257)	(0.0260)	(0.0670)
other_reason	0.0519	−0.00898	−0.00898	−0.00780	0.0466
	(0.0454)	(0.0279)	(0.0276)	(0.0271)	(0.0414)
elementary_work	−0.131***	−0.0934***	−0.0934***	−0.0930***	−0.136***
	(0.0347)	(0.0320)	(0.0321)	(0.0321)	(0.0371)
payunexp	0.610***	0.573***	0.573***	0.573***	0.631***
	(0.0446)	(0.0334)	(0.0332)	(0.0331)	(0.0489)
paymeat	0.724***	0.570***	0.570***	0.570***	0.755***
	(0.150)	(0.0621)	(0.0635)	(0.0632)	(0.163)
bad_living	−0.209***	−0.206***	−0.206***	−0.206***	−0.204***
	(0.0411)	(0.0374)	(0.0374)	(0.0374)	(0.0409)
crime	−0.393***	−0.334***	−0.334***	−0.334***	−0.389***
	(0.0331)	(0.0237)	(0.0238)	(0.0238)	(0.0327)
age	−0.0175***	−0.0166***	−0.0166***	−0.0166***	−0.0171***
	(0.00233)	(0.00205)	(0.00205)	(0.00207)	(0.00233)
married	0.336***	0.337***	0.337***	0.337***	0.328***

Response variable: life satisfaction	OLS	OLS-FE	OLS-2-FE	OLS-2	
	(0.0258)	(0.0125)	(0.0130)	(0.0126)	(0.0254)
female	0.0674**	0.0714**	0.0714**	0.0716**	0.0646**
	(0.0276)	(0.0288)	(0.0287)	(0.0285)	(0.0269)
child	−0.0694***	−0.0441**	−0.0441**	−0.0443**	−0.0676***
	(0.0223)	(0.0173)	(0.0174)	(0.0177)	(0.0210)
female_child	−0.106**	−0.0861**	−0.0861**	−0.0861**	−0.118***
	(0.0390)	(0.0392)	(0.0390)	(0.0391)	(0.0383)
widow	−0.221***	−0.200***	−0.200***	−0.201***	−0.239***
	(0.0473)	(0.0468)	(0.0471)	(0.0469)	(0.0470)
friend	0.995***	0.982***	0.982***	0.982***	0.985***
	(0.128)	(0.131)	(0.131)	(0.131)	(0.126)
health_limit	−0.490***	−0.553***	−0.553***	−0.552***	−0.480***
	(0.0714)	(0.0599)	(0.0600)	(0.0601)	(0.0724)
primary	−0.227	−0.101	−0.101	−0.1000	−0.217
	(0.144)	(0.0751)	(0.0755)	(0.0756)	(0.146)
tertiary	0.125***	0.135***	0.135***	0.135***	0.134***
	(0.0368)	(0.0277)	(0.0277)	(0.0275)	(0.0351)
temp_job	−0.112**	−0.137***	−0.137***	−0.136***	−0.129***
	(0.0496)	(0.0264)	(0.0262)	(0.0258)	(0.0427)
manager	0.135***	0.139***	0.139***	0.139***	0.158***
	(0.0370)	(0.0185)	(0.0190)	(0.0187)	(0.0380)
own	0.102**	0.147***	0.147***	0.146***	0.0753
	(0.0449)	(0.0262)	(0.0261)	(0.0261)	(0.0487)
FE		1.000***	1.000***	1.001***	
		(0.00709)	(0.00669)	(0.00606)	
curtain			$-1.15e-08$		
			(0.0189)		
income_diff				0.00301	0.0351***

Response variable: life satisfaction	OLS	OLS-FE	OLS-2-FE	OLS-2	
				(0.00827)	(0.00902)
_cons	5.675***	6.627***	6.627***	6.645***	6.154***
	(0.262)	(0.139)	(0.143)	(0.145)	(0.149)
N	142112	142112	142112	142112	142112
R^2	0.159	0.197	0.197	0.197	0.156
pseudo R^2					

Source: The data comes from EU-SILC 2013, contains only records of employees reporting their life satisfaction, and are weighted by the sample weights.
Notes: Standard errors in parentheses clustered at country-level. ***, **, and * denote statistical significance at the 1 %, 5 %, and 10 % level.

Appendix C

Additional results on Feeling happy

Table C.1: Material prosperity & feeling happy with country fixed-effects

	OLS	OProbit	Ologit
feeling happy			
lg_income	0.00972	0.00363	0.00781
	(0.00789)	(0.00445)	(0.00730)
hour_worked	−0.00667***	−0.00360***	−0.00660***
	(0.00128)	(0.000687)	(0.00116)
underemployed	−0.282***	−0.147***	−0.267***
	(0.0917)	(0.0512)	(0.0946)
want_nmh	0.165***	0.0869***	0.171***
	(0.0234)	(0.0125)	(0.0204)
housework	−0.0115	−0.00956	−0.0266
	(0.0682)	(0.0397)	(0.0648)
other_reason	−0.0256	−0.00789	−0.0272
	(0.0398)	(0.0247)	(0.0447)
elementary_work	−0.0958***	−0.0462**	−0.0913***
	(0.0337)	(0.0184)	(0.0279)
payunexp	0.403***	0.214***	0.394***
	(0.0280)	(0.0118)	(0.0204)
paymeat	0.422***	0.198***	0.363***
	(0.0471)	(0.0249)	(0.0389)
bad_living	−0.213***	−0.119***	−0.214***
	(0.0334)	(0.0172)	(0.0294)
crime	−0.299***	−0.160***	−0.299***
	(0.0299)	(0.0156)	(0.0286)
age	−0.0931***	−0.0524***	−0.0953***
	(0.00607)	(0.00386)	(0.00759)
age_sq	0.000865***	0.000490***	0.000897***
	(0.0000681)	(0.0000458)	(0.0000897)
married	0.336***	0.184***	0.333***
	(0.0287)	(0.0153)	(0.0273)
female	−0.0921***	−0.0510***	−0.0872***

	(0.0291)	(0.0154)	(0.0279)
child	0.0824***	0.0443***	0.0623***
	(0.0218)	(0.0130)	(0.0238)
female_child	−0.0932***	−0.0519***	−0.0844***
	(0.0276)	(0.0155)	(0.0286)
widow	−0.310***	−0.135***	−0.255***
	(0.0749)	(0.0359)	(0.0701)
friend	1.287***	0.632***	1.158***
	(0.166)	(0.0915)	(0.172)
health_limit	−0.644***	−0.338***	−0.605***
	(0.0526)	(0.0300)	(0.0572)
primary	−0.0935	−0.0510	−0.101
	(0.0923)	(0.0474)	(0.0881)
tertiary	−0.0506**	−0.0343**	−0.0611**
	(0.0242)	(0.0138)	(0.0240)
temp_job	−0.0672**	−0.0361**	−0.0660**
	(0.0300)	(0.0175)	(0.0324)
manager	0.0981***	0.0568***	0.106***
	(0.0220)	(0.0120)	(0.0193)
own	0.0179	0.00907	0.0163
	(0.0176)	(0.00925)	(0.0187)
Austria	0.147***	0.0263***	0.0528***
	(0.0132)	(0.00561)	(0.00974)
Belgique	0.325***	0.126***	0.219***
	(0.0101)	(0.00431)	(0.0101)
Bulgaria	−1.059***	−0.615***	−1.108***
	(0.0337)	(0.0328)	(0.0604)
Schwitzerland	0.236***	0.0710***	0.124***
	(0.0114)	(0.00558)	(0.0103)
Cyprus	−0.538***	−0.354***	−0.643***
	(0.0143)	(0.0195)	(0.0419)
Czech Rep.	−0.669***	−0.443***	−0.821***
	(0.0381)	(0.0353)	(0.0661)
Germany	−0.238***	−0.206***	−0.352***
	(0.00999)	(0.00939)	(0.0199)
Denmark	0.408***	0.163***	0.290***
	(0.0202)	(0.00879)	(0.0145)
Estonia9	−0.635***	−0.417***	−0.743***
	(0.0194)	(0.0211)	(0.0409)
Greece10	−1.472***	−0.791***	−1.489***
	(0.0133)	(0.0202)	(0.0456)
Spain	0.268***	0.113***	0.193***
	(0.0164)	(0.00678)	(0.0119)
Finland	0.407***	0.157***	0.291***
	(0.0130)	(0.00676)	(0.0147)
France	0.0808***	−0.0170***	−0.0385***
	(0.0143)	(0.00501)	(0.0107)
Croatia	−0.578***	−0.404***	−0.746***

	(0.0336)	(0.0332)	(0.0614)
Hungary	−0.0200	−0.0874**	−0.128*
	(0.0678)	(0.0422)	(0.0694)
Ireland	0.377***	0.156***	0.282***
	(0.0223)	(0.00672)	(0.0151)
Iceland	0.749***	0.382***	0.707***
	(0.0525)	(0.0195)	(0.0290)
Italia	−0.444***	−0.293***	−0.577***
	(0.0125)	(0.0136)	(0.0327)
Lihuania	−0.373***	−0.267***	−0.523***
	(0.0189)	(0.0184)	(0.0385)
Luxembourg	0.266***	0.0898***	0.177***
	(0.0135)	(0.00872)	(0.0156)
Latvia	−1.028***	−0.595***	−1.093***
	(0.0262)	(0.0275)	(0.0515)
Malta	0	−0.0477***	−0.0626***
	(.)	(0.00819)	(0.0151)
Netherlands	0.641***	0.322***	0.570***
	(0.0117)	(0.0152)	(0.0366)
Norway	−0.120***	−0.139***	−0.266***
	(0.0243)	(0.0171)	(0.0328)
Poland	0.139***	0.0213	0.0706***
	(0.0209)	(0.0135)	(0.0210)
Portugal	−0.0627*	−0.0675***	−0.155***
	(0.0310)	(0.0217)	(0.0434)
Romania	−1.210***	−0.693***	−1.233***
	(0.0234)	(0.0327)	(0.0609)
Serbia	−0.395***	−0.268***	−0.522***
	(0.0526)	(0.0372)	(0.0710)
Sweden	−0.0481*	−0.0815***	−0.143***
	(0.0249)	(0.0161)	(0.0302)
Slovenia	0.167***	0.0233***	0.0379**
	(0.0126)	(0.00809)	(0.0155)
Slovakia	−0.183***	−0.184***	−0.333***
	(0.0135)	(0.0153)	(0.0297)
United Kingdom	0.111***	0	0
	(0.0145)	(.)	(.)
_cons	7.341***		
	(0.167)		
N	140515	140515	140515
R^2	0.135		
pseudo R^2		0.055	0.057

Source: The data comes from EU-SILC 2013, contains only records of employees reporting their life satisfaction, and are weighted by the sample weights.

Notes: Standard errors in parentheses clustered at country-level. ***, **, and * denote statistical significance at the 1 %, 5 %, and 10 % level.

Table C.2: Differences in the country fixed-effect: Ordinary Least Square regression

	OLS	OProbit	Ologit
main			
lg_income	0.00593	0.00150	0.00381
	(0.00775)	(0.00443)	(0.00728)
hour_worked	−0.00665***	−0.00358***	−0.00653***
	(0.00128)	(0.000684)	(0.00115)
underemployed	−0.285***	−0.149***	−0.270***
	(0.0932)	(0.0520)	(0.0962)
want_nmh	0.153***	0.0804***	0.161***
	(0.0215)	(0.0114)	(0.0191)
housework	−0.0157	−0.0119	−0.0305
	(0.0678)	(0.0394)	(0.0648)
other_reason	−0.0223	−0.00616	−0.0209
	(0.0373)	(0.0234)	(0.0423)
elementary_work	−0.101***	−0.0491***	−0.0956***
	(0.0332)	(0.0181)	(0.0276)
payunexp	0.405***	0.215***	0.395***
	(0.0275)	(0.0116)	(0.0204)
paymeat	0.422***	0.198***	0.364***
	(0.0463)	(0.0245)	(0.0382)
bad_living	−0.213***	−0.118***	−0.213***
	(0.0332)	(0.0171)	(0.0294)
crime	−0.299***	−0.160***	−0.298***
	(0.0295)	(0.0156)	(0.0284)
age15_25	0.232	0.113	0.223
	(0.163)	(0.0931)	(0.155)
age26_36	−0.140	−0.0945	−0.146
	(0.147)	(0.0856)	(0.148)
age37_47	−0.440***	−0.262***	−0.448***
	(0.136)	(0.0788)	(0.133)
age48_58	−0.590***	−0.342***	−0.585***
	(0.137)	(0.0777)	(0.129)
age59_69	−0.497***	−0.288***	−0.484***
	(0.138)	(0.0762)	(0.126)
married	0.318***	0.174***	0.314***
	(0.0292)	(0.0162)	(0.0287)
female	−0.0920***	−0.0508***	−0.0876***
	(0.0288)	(0.0152)	(0.0275)
child	0.0674***	0.0360***	0.0468**
	(0.0203)	(0.0119)	(0.0217)
female_child	−0.0964***	−0.0537***	−0.0874***
	(0.0279)	(0.0157)	(0.0292)
widow	−0.333***	−0.148***	−0.277***
	(0.0822)	(0.0397)	(0.0752)
friend	1.292***	0.635***	1.162***
	(0.165)	(0.0909)	(0.172)

health_limit	−0.651***	−0.341***	−0.612***
	(0.0526)	(0.0298)	(0.0568)
primary	−0.0985	−0.0539	−0.107
	(0.0951)	(0.0489)	(0.0894)
tertiary	−0.0542**	−0.0363***	−0.0650***
	(0.0232)	(0.0134)	(0.0235)
temp_job	−0.0449	−0.0235	−0.0415
	(0.0308)	(0.0177)	(0.0334)
manager	0.0932***	0.0541***	0.101***
	(0.0215)	(0.0117)	(0.0189)
own	0.0169	0.00850	0.0160
	(0.0164)	(0.00835)	(0.0167)
Austria	0.144***	0.0274***	0.0541***
	(0.0128)	(0.00563)	(0.00962)
Belgique	0.314***	0.123***	0.212***
	(0.0102)	(0.00501)	(0.0116)
Bulgaria	−1.076***	−0.621***	−1.121***
	(0.0320)	(0.0316)	(0.0584)
Schwitzerland	0.233***	0.0723***	0.125***
	(0.0107)	(0.00530)	(0.00995)
Cyprus	−0.549***	−0.356***	−0.650***
	(0.0133)	(0.0191)	(0.0413)
Czech Rep.	−0.698***	−0.456***	−0.846***
	(0.0354)	(0.0340)	(0.0640)
Germany	−0.248***	−0.208***	−0.358***
	(0.00989)	(0.00887)	(0.0191)
Denmark	0.388***	0.154***	0.274***
	(0.0181)	(0.00783)	(0.0141)
Estonia	−0.649***	−0.422***	−0.752***
	(0.0183)	(0.0198)	(0.0389)
Greece	−1.490***	−0.797***	−1.501***
	(0.0147)	(0.0195)	(0.0447)
Spain	0.245***	0.103***	0.173***
	(0.0145)	(0.00577)	(0.0106)
Finland	0.393***	0.152***	0.282***
	(0.0130)	(0.00711)	(0.0158)
France	0.0660***	−0.0224***	−0.0495***
	(0.0138)	(0.00394)	(0.00878)
Croatia	−0.597***	−0.412***	−0.759***
	(0.0308)	(0.0319)	(0.0595)
Hungary	−0.0607	−0.107***	−0.165**
	(0.0641)	(0.0406)	(0.0671)
Ireland	0.367***	0.154***	0.275***
	(0.0213)	(0.00660)	(0.0156)
Iceland	0.721***	0.369***	0.681***
	(0.0500)	(0.0184)	(0.0278)
Italia	−0.468***	−0.303***	−0.596***
	(0.0121)	(0.0119)	(0.0300)

Lihuania	−0.382***	−0.268***	−0.527***
	(0.0176)	(0.0175)	(0.0373)
Luxembourg	0.258***	0.0877***	0.173***
	(0.0119)	(0.00826)	(0.0150)
Latvia	−1.043***	−0.599***	−1.101***
	(0.0245)	(0.0261)	(0.0494)
Malta	0	−0.0446***	−0.0576***
	(.)	(0.00815)	(0.0152)
Netherlands	0.631***	0.318***	0.563***
	(0.0123)	(0.0156)	(0.0374)
Norway	−0.142***	−0.149***	−0.283***
	(0.0230)	(0.0162)	(0.0311)
Poland	0.119***	0.0126	0.0535**
	(0.0197)	(0.0131)	(0.0210)
Portugal	−0.0796**	−0.0739***	−0.167***
	(0.0292)	(0.0211)	(0.0421)
Romania	−1.235***	−0.704***	−1.251***
	(0.0217)	(0.0317)	(0.0597)
Serbia	−0.430***	−0.285***	−0.553***
	(0.0501)	(0.0361)	(0.0693)
Sweden	−0.0749***	−0.0935***	−0.164***
	(0.0232)	(0.0151)	(0.0287)
Slovenia	0.138***	0.00966	0.0131
	(0.0108)	(0.00629)	(0.0126)
Slovakia	−0.198***	−0.189***	−0.343***
	(0.0127)	(0.0149)	(0.0292)
United Kingdom	0.105***	0	0
	(0.0144)	(.)	(.)
_cons	5.485***		
	(0.230)		
N	140523	140523	140523
R^2	0.133		
pseudo R^2		0.054	0.056

Source: The data comes from EU-SILC 2013, contains only records of employees reporting their life satisfaction, and are weighted by the sample weights.

Notes: Standard errors in parentheses clustered at country-level. ***, **, and * denote statistical significance at the 1 %, 5 %, and 10 % level.

Table C.3: The impact of material prosperity on feeling happy: Model extensions

Response variable feeling happy	OLS2_cluster	OLS3_cluster	OLS5	OLS_4
lg_income	0.00972	-0.557^{*}	-0.557^{*}	
	(0.00789)	(0.309)	(0.309)	
income_diff		0.568^{*}	0.568^{*}	0.0118
		(0.312)	(0.312)	(0.00866)
hour_worked	-0.00667^{***}	-0.00653^{***}	-0.00653^{***}	-0.00671^{***}
	(0.00128)	(0.00129)	(0.00129)	(0.00129)
underemployed	-0.282^{***}	-0.283^{***}	-0.283^{***}	-0.280^{***}
	(0.0917)	(0.0925)	(0.0925)	(0.0917)
want_nmh	0.165^{***}	0.164^{***}	0.164^{***}	0.166^{***}
	(0.0234)	(0.0249)	(0.0249)	(0.0234)
housework	-0.0115	-0.00849	-0.00849	-0.0104
	(0.0682)	(0.0686)	(0.0686)	(0.0684)
other_reason	-0.0256	-0.0190	-0.0190	-0.0242
	(0.0398)	(0.0410)	(0.0410)	(0.0401)
elementary_work	-0.0958^{***}	-0.0991^{***}	-0.0991^{***}	-0.0952^{***}
	(0.0337)	(0.0341)	(0.0341)	(0.0336)
payunexp	0.403^{***}	0.409^{***}	0.409^{***}	0.403^{***}
	(0.0280)	(0.0285)	(0.0285)	(0.0280)
paymeat	0.422^{***}	0.421^{***}	0.421^{***}	0.422^{***}
	(0.0471)	(0.0469)	(0.0469)	(0.0471)
bad_living	-0.213^{***}	-0.213^{***}	-0.213^{***}	-0.213^{***}
	(0.0334)	(0.0337)	(0.0337)	(0.0334)
crime	-0.299^{***}	-0.292^{***}	-0.292^{***}	-0.299^{***}
	(0.0299)	(0.0317)	(0.0317)	(0.0299)
age	-0.0931^{***}	-0.0928^{***}	-0.0928^{***}	-0.0933^{***}

	(0.00607)	(0.00597)	(0.00597)	(0.00607)
age_sq	0.000865***	0.000862***	0.000862***	0.000867***
	(0.0000681)	(0.0000678)	(0.0000678)	(0.0000679)
married	0.336***	0.335***	0.335***	0.336***
	(0.0287)	(0.0286)	(0.0286)	(0.0288)
female	−0.0921***	−0.0914***	−0.0914***	−0.0918***
	(0.0291)	(0.0287)	(0.0287)	(0.0291)
child	0.0824***	0.0797***	0.0797***	0.0822***
	(0.0218)	(0.0214)	(0.0214)	(0.0218)
female_child	−0.0932***	−0.0911***	−0.0911***	−0.0928***
	(0.0276)	(0.0274)	(0.0274)	(0.0276)
widow	−0.310***	−0.311***	−0.311***	−0.310***
	(0.0749)	(0.0749)	(0.0749)	(0.0749)
friend	1.287***	1.288***	1.288***	1.286***
	(0.166)	(0.165)	(0.165)	(0.166)
health_limit	−0.644***	−0.643***	−0.643***	−0.643***
	(0.0526)	(0.0522)	(0.0522)	(0.0526)
primary	−0.0935	−0.0922	−0.0922	−0.0929
	(0.0923)	(0.0931)	(0.0931)	(0.0922)
tertiary	−0.0506**	−0.0465*	−0.0465*	−0.0512**
	(0.0242)	(0.0258)	(0.0258)	(0.0240)
temp_job	−0.0672**	−0.0716**	−0.0716**	−0.0657**
	(0.0300)	(0.0278)	(0.0278)	(0.0305)
manager	0.0981***	0.0987***	0.0987***	0.0977***
	(0.0220)	(0.0221)	(0.0221)	(0.0221)
own	0.0179	0.0127	0.0127	0.0176
	(0.0176)	(0.0163)	(0.0163)	(0.0175)
curtain	−0.635***		2.144	−0.641***
	(0.0194)		(1.485)	(0.0170)

Austria	0.147^{***}	-0.188^{***}	2.309	0.151^{***}
	(0.0132)	(0.0410)	(1.589)	(0.0143)
Belgique	0.325^{***}	0.0478^{**}	2.545	0.329^{***}
	(0.0101)	(0.0182)	(1.616)	(0.0106)
Bulgaria	-0.425^{***}	-2.479^{***}	-2.126^{***}	-0.435^{***}
	(0.0244)	(0.640)	(0.498)	(0.0203)
Schwitzerland	0.236^{***}	-0.0435^{**}	2.453	0.240^{***}
	(0.0114)	(0.0179)	(1.619)	(0.0108)
Cyprus	-0.538^{***}	-1.074^{***}	1.423	-0.539^{***}
	(0.0143)	(0.151)	(1.476)	(0.0139)
Czech Rep.	-0.0345	-3.172^{**}	-2.819^{**}	-0.0634^{***}
	(0.0279)	(1.227)	(1.085)	(0.0128)
Germany	-0.238^{***}	-0.551^{***}	1.946	-0.235^{***}
	(0.00999)	(0.0318)	(1.599)	(0.0104)
Denmark	0.408^{***}	-0.936	1.561	0.394^{***}
	(0.0202)	(0.590)	(1.038)	(0.0123)
Estonia	0	-1.461^{***}	-1.109^{***}	0
	(.)	(0.308)	(0.166)	(.)
Greece	-1.472^{***}	-2.092^{***}	0.405	-1.474^{***}
	(0.0133)	(0.197)	(1.432)	(0.0134)
Spain	0.268^{***}	-0.278^{*}	2.219	0.267^{***}
	(0.0164)	(0.160)	(1.468)	(0.0159)
Finland	0.407^{***}	0.0919^{***}	2.589	0.410^{***}
	(0.0130)	(0.0333)	(1.598)	(0.0129)
France	0.0808^{***}	-0.344^{***}	2.153	0.0816^{***}
	(0.0143)	(0.0927)	(1.536)	(0.0144)
Croatia	0.0572^{**}	-2.507^{**}	-2.154^{***}	0.0382^{**}
	(0.0236)	(0.914)	(0.772)	(0.0141)
Hungary	0.615^{***}	-4.107^{*}	-3.755^{*}	0.558^{***}

	(0.0566)	(2.096)	(1.954)	(0.0204)
Ireland	0.377***	−0.0151	2.482	0.378***
	(0.0223)	(0.0827)	(1.547)	(0.0225)
Iceland	0.749***	−2.497		0.702***
	(0.0525)	(1.628)		(0.0191)
Italia	−0.444***	−0.872***	1.625	−0.444***
	(0.0125)	(0.0934)	(1.535)	(0.0128)
Lihuania	0.262***	−1.309***	−0.956***	0.260***
	(0.00932)	(0.373)	(0.231)	(0.00894)
Luxembourg	0.266***	0	2.497	0.270***
	(0.0135)	(.)	(1.628)	(0.0146)
Latvia	−0.393***	−1.990***	−1.637***	−0.396***
	(0.0102)	(0.383)	(0.241)	(0.00909)
Malta	0	−0.481***	2.016	0
	(.)	(0.125)	(1.503)	(.)
Netherlands	0.641***	0.391***	2.888*	0.645***
	(0.0117)	(0.0161)	(1.631)	(0.0104)
Norway	−0.120***	−1.484**	1.013	−0.135***
	(0.0243)	(0.603)	(1.025)	(0.0151)
Poland	0.774***	−1.401*	−1.049*	0.761***
	(0.0172)	(0.703)	(0.561)	(0.0162)
Portugal	−0.0627*	−0.851***	1.646	−0.0683**
	(0.0310)	(0.285)	(1.343)	(0.0279)
Romania	−0.575***	−3.133***	−2.780***	−0.594***
	(0.0162)	(0.909)	(0.767)	(0.0137)
Serbia	0.240***	−3.973**	−3.620**	0.192***
	(0.0421)	(1.816)	(1.674)	(0.0137)
Sweden	−0.0481*	−1.632**	0.865	−0.0667***
	(0.0249)	(0.722)	(0.905)	(0.0132)

Slovenia	0.802^{***}	-0.353^{**}		0.807^{***}
	(0.0154)	(0.142)		(0.0138)
Slovakia	0.452^{***}	-0.945^{***}	-0.592^{***}	0.453^{***}
	(0.0134)	(0.278)	(0.136)	(0.0133)
United Kingdom	0.111^{***}	-0.305^{***}	2.192	0.112^{***}
	(0.0145)	(0.0891)	(1.540)	(0.0144)
_cons	7.341^{***}	13.45^{***}	10.96^{***}	7.444^{***}
	(0.167)	(3.177)	(1.557)	(0.209)
N	140515	140515	140515	140515
R^2	0.135	0.135	0.135	0.135

Source: The data comes from EU-SILC 2013, contains only records of employees reporting their life satisfaction, and are weighted by the sample weights.
Notes: Standard errors in parentheses clustered at country-level. ***, **, and * denote statistical significance at the 1 %, 5 %, and 10 % level.

Table C.4: The impact of material prosperity on happiness: Model modifications

	Oprobit2_cluster	Oprobit3_cl	Oprobit5	Oprobit_4
feel_happy				
lg_income	0.00363	-0.316^{*}	-0.316^{*}	
	(0.00445)	(0.179)	(0.179)	
income_diff		0.320^{*}	0.320^{*}	0.00479
		(0.180)	(0.180)	(0.00490)
hour_worked	-0.00360^{***}	-0.00352^{***}	-0.00352^{***}	-0.00362^{***}
	(0.000687)	(0.000692)	(0.000692)	(0.000693)
underemployed	-0.147^{***}	-0.148^{***}	-0.148^{***}	-0.146^{***}
	(0.0512)	(0.0516)	(0.0516)	(0.0512)
want_nmh	0.0869^{***}	0.0862^{***}	0.0862^{***}	0.0875^{***}
	(0.0125)	(0.0130)	(0.0130)	(0.0126)
housework	-0.00956	-0.00787	-0.00787	-0.00895
	(0.0397)	(0.0399)	(0.0399)	(0.0398)
other_reason	-0.00789	-0.00418	-0.00418	-0.00711
	(0.0247)	(0.0258)	(0.0258)	(0.0250)
elementary_work	-0.0462^{**}	-0.0481^{***}	-0.0481^{***}	-0.0459^{**}
	(0.0184)	(0.0186)	(0.0186)	(0.0183)
payunexp	0.214^{***}	0.217^{***}	0.217^{***}	0.214^{***}
	(0.0118)	(0.0119)	(0.0119)	(0.0118)
paymeat	0.198^{***}	0.198^{***}	0.198^{***}	0.198^{***}
	(0.0249)	(0.0248)	(0.0248)	(0.0249)
bad_living	-0.119^{***}	-0.118^{***}	-0.118^{***}	-0.119^{***}
	(0.0172)	(0.0174)	(0.0174)	(0.0172)
crime	-0.160^{***}	-0.156^{***}	-0.156^{***}	-0.160^{***}
	(0.0156)	(0.0168)	(0.0168)	(0.0157)
age	-0.0524^{***}	-0.0523^{***}	-0.0523^{***}	-0.0525^{***}

	(0.00386)	(0.00382)	(0.00382)	(0.00385)
age_sq	0.000490***	0.000488***	0.000488***	0.000491***
	(0.0000458)	(0.0000458)	(0.0000458)	(0.0000457)
married	0.184***	0.184***	0.184***	0.184***
	(0.0153)	(0.0154)	(0.0154)	(0.0153)
female	−0.0510***	−0.0506***	−0.0506***	−0.0508***
	(0.0154)	(0.0151)	(0.0151)	(0.0153)
child	0.0443***	0.0428***	0.0428***	0.0442***
	(0.0130)	(0.0128)	(0.0128)	(0.0130)
female_child	−0.0519***	−0.0506***	−0.0506***	−0.0516***
	(0.0155)	(0.0154)	(0.0154)	(0.0155)
widow	−0.135***	−0.136***	−0.136***	−0.135***
	(0.0359)	(0.0359)	(0.0359)	(0.0359)
friend	0.632***	0.633***	0.633***	0.632***
	(0.0915)	(0.0913)	(0.0913)	(0.0915)
health_limit	−0.338***	−0.337***	−0.337***	−0.337***
	(0.0300)	(0.0298)	(0.0298)	(0.0300)
primary	−0.0510	−0.0504	−0.0504	−0.0507
	(0.0474)	(0.0481)	(0.0481)	(0.0474)
tertiary	−0.0343**	−0.0320**	−0.0320**	−0.0346**
	(0.0138)	(0.0148)	(0.0148)	(0.0137)
temp_job	−0.0361**	−0.0386**	−0.0386**	−0.0352**
	(0.0175)	(0.0163)	(0.0163)	(0.0179)
manager	0.0568***	0.0571***	0.0571***	0.0566***
	(0.0120)	(0.0120)	(0.0120)	(0.0121)
own	0.00907	0.00619	0.00619	0.00890
	(0.00925)	(0.00844)	(0.00844)	(0.00920)
curtain	−0.184***		−0.379***	−0.186***
	(0.0153)		(0.109)	(0.0132)

Austria	0.0263^{***}	0.0719^{**}	0.0719^{**}	0.0274^{***}
	(0.00561)	(0.0288)	(0.0288)	(0.00612)
Belgique	0.126^{***}	0.204^{***}	0.204^{***}	0.127^{***}
	(0.00431)	(0.0430)	(0.0430)	(0.00369)
Bulgaria	-0.431^{***}	-1.181^{***}	-0.802^{***}	-0.436^{***}
	(0.0203)	(0.317)	(0.208)	(0.0162)
Schwitzerland	0.0710^{***}	0.148^{***}	0.148^{***}	0.0720^{***}
	(0.00558)	(0.0453)	(0.0453)	(0.00509)
Cyprus	-0.354^{***}	-0.422^{***}	-0.422^{***}	-0.354^{***}
	(0.0195)	(0.0385)	(0.0385)	(0.0188)
Czech Rep.	-0.259^{***}	-1.619^{**}	-1.241^{**}	-0.270^{***}
	(0.0216)	(0.655)	(0.547)	(0.00884)
Germany	-0.206^{***}	-0.148^{***}	-0.148^{***}	-0.205^{***}
	(0.00939)	(0.0372)	(0.0372)	(0.0102)
Denmark	0.163^{***}	-0.360	-0.360	0.157^{***}
	(0.00879)	(0.291)	(0.291)	(0.00587)
Estonia	-0.234^{***}	-0.649^{***}	-0.270^{***}	-0.234^{***}
	(0.00964)	(0.125)	(0.0183)	(0.00930)
Greece	-0.791^{***}	-0.906^{***}	-0.906^{***}	-0.792^{***}
	(0.0202)	(0.0612)	(0.0612)	(0.0189)
Spain	0.113^{***}	0.0402	0.0402	0.113^{***}
	(0.00678)	(0.0420)	(0.0420)	(0.00639)
Finland	0.157^{***}	0.214^{***}	0.214^{***}	0.158^{***}
	(0.00676)	(0.0335)	(0.0335)	(0.00640)
France	-0.0170^{***}	-0.0219^{***}	-0.0219^{***}	-0.0170^{***}
	(0.00501)	(0.00503)	(0.00503)	(0.00498)
Croatia	-0.221^{***}	-1.258^{***}	-0.879^{**}	-0.228^{***}
	(0.0190)	(0.474)	(0.366)	(0.0106)
Hungary	0.0962^{***}	-2.157^{*}	-1.779^{*}	0.0747^{***}

	(0.0287)	(1.159)	(1.051)	(0.00623)
Ireland	0.156***	0.170***	0.170***	0.156***
	(0.00672)	(0.00566)	(0.00566)	(0.00672)
Iceland	0.382***	−1.214	−1.214	0.364***
	(0.0195)	(0.892)	(0.892)	(0.00775)
Italia	−0.293***	−0.300***	−0.300***	−0.293***
	(0.0136)	(0.0134)	(0.0134)	(0.0135)
Lihuania	−0.0833***	−0.560***	−0.181***	−0.0844***
	(0.00579)	(0.163)	(0.0550)	(0.00501)
Luxembourg	0.0898***	0.174***	0.174***	0.0908***
	(0.00872)	(0.0515)	(0.0515)	(0.00893)
Latvia	−0.411***	−0.903***	−0.524***	−0.412***
	(0.0144)	(0.168)	(0.0598)	(0.0131)
Malta	−0.0477***	−0.0847***	−0.0847***	−0.0481***
	(0.00819)	(0.0224)	(0.0224)	(0.00809)
Netherlands	0.322***	0.416***	0.416***	0.323***
	(0.0152)	(0.0521)	(0.0521)	(0.0141)
Norway	−0.139***	−0.674**	−0.674**	−0.145***
	(0.0171)	(0.297)	(0.297)	(0.00994)
Poland	0.205***	−0.613*	−0.234	0.200***
	(0.00508)	(0.355)	(0.247)	(0.00947)
Portugal	−0.0675***	−0.278**	−0.278**	−0.0701***
	(0.0217)	(0.114)	(0.114)	(0.0198)
Romania	−0.510***	−1.543***	−1.164***	−0.517***
	(0.0182)	(0.471)	(0.363)	(0.0103)
Serbia	−0.0849***	−2.051**	−1.672*	−0.103***
	(0.0240)	(0.996)	(0.888)	(0.00484)
Sweden	−0.0815***	−0.740**	−0.740**	−0.0887***
	(0.0161)	(0.366)	(0.366)	(0.00747)

Slovenia	0.207^{***}	-0.0351	0.344^{***}	0.208^{***}
	(0.0102)	(0.0318)	(0.0774)	(0.00862)
Slovakia	0	-0.379^{***}	0	0
	(.)	(0.109)	(.)	(.)
United Kingdom	0	0	0	0
	(.)	(.)	(.)	(.)
N	140515	140515	140515	140515
R^2				

Source: The data comes from EU-SILC 2013, contains only records of employees reporting their life satisfaction, and are weighted by the sample weights.
Notes: Standard errors in parentheses clustered at country-level. ***, **, and * denote statistical significance at the 1 %, 5 %, and 10 % level.

Table C.5: The impact of material prosperity on happiness: Model modifications

	Ologit2_cluster	Ologit3_cl	Ologit5	Ologit_4
feel_happy				
lg_income	0.00781	−0.547	−0.547	
	(0.00730)	(0.343)	(0.343)	
hour_worked	−0.00660***	−0.00645***	−0.00645***	−0.00663***
	(0.00116)	(0.00115)	(0.00115)	(0.00117)
underemployed	−0.267***	−0.268***	−0.268***	−0.266***
	(0.0946)	(0.0957)	(0.0957)	(0.0947)
want_nmh	0.171***	0.170***	0.170***	0.172***
	(0.0204)	(0.0206)	(0.0206)	(0.0205)
housework	−0.0266	−0.0237	−0.0237	−0.0255
	(0.0648)	(0.0653)	(0.0653)	(0.0650)
other_reason	−0.0272	−0.0209	−0.0209	−0.0259
	(0.0447)	(0.0469)	(0.0469)	(0.0452)
elementary_work	−0.0913***	−0.0944***	−0.0944***	−0.0908***
	(0.0279)	(0.0280)	(0.0280)	(0.0277)
payunexp	0.394***	0.399***	0.399***	0.394***
	(0.0204)	(0.0200)	(0.0200)	(0.0204)
paymeat	0.363***	0.364***	0.364***	0.363***
	(0.0389)	(0.0386)	(0.0386)	(0.0389)
bad_living	−0.214***	−0.213***	−0.213***	−0.214***
	(0.0294)	(0.0296)	(0.0296)	(0.0294)
crime	−0.299***	−0.292***	−0.292***	−0.298***
	(0.0286)	(0.0306)	(0.0306)	(0.0287)
age	−0.0953***	−0.0950***	−0.0950***	−0.0955***
	(0.00759)	(0.00753)	(0.00753)	(0.00757)
age_sq	0.000897***	0.000893***	0.000893***	0.000899***

	(0.0000897)	(0.0000896)	(0.0000896)	(0.0000894)
married	0.333***	0.333***	0.333***	0.334***
	(0.0273)	(0.0275)	(0.0275)	(0.0273)
female	−0.0872***	−0.0865***	−0.0865***	−0.0869***
	(0.0279)	(0.0275)	(0.0275)	(0.0278)
child	0.0623***	0.0598**	0.0598**	0.0621***
	(0.0238)	(0.0234)	(0.0234)	(0.0238)
female_child	−0.0844***	−0.0825***	−0.0825***	−0.0840***
	(0.0286)	(0.0284)	(0.0284)	(0.0286)
widow	−0.255***	−0.256***	−0.256***	−0.255***
	(0.0701)	(0.0698)	(0.0698)	(0.0701)
friend	1.158***	1.159***	1.159***	1.158***
	(0.172)	(0.172)	(0.172)	(0.172)
health_limit	−0.605***	−0.604***	−0.604***	−0.605***
	(0.0572)	(0.0570)	(0.0570)	(0.0571)
primary	−0.101	−0.0992	−0.0992	−0.100
	(0.0881)	(0.0895)	(0.0895)	(0.0880)
tertiary	−0.0611**	−0.0572**	−0.0572**	−0.0617***
	(0.0240)	(0.0259)	(0.0259)	(0.0239)
temp_job	−0.0660**	−0.0698**	−0.0698**	−0.0644**
	(0.0324)	(0.0305)	(0.0305)	(0.0329)
manager	0.106***	0.107***	0.107***	0.106***
	(0.0193)	(0.0196)	(0.0196)	(0.0194)
own	0.0163	0.0110	0.0110	0.0160
	(0.0187)	(0.0169)	(0.0169)	(0.0186)
curtain	−0.333***		−0.673***	−0.337***
	(0.0297)		(0.208)	(0.0264)
Austria	0.0528***	0.131**	0.131**	0.0549***
	(0.00974)	(0.0532)	(0.0532)	(0.0104)

Belgique	0.219^{***}	0.354^{***}	0.354^{***}	0.221^{***}
	(0.0101)	(0.0816)	(0.0816)	(0.00888)
Bulgaria	-0.775^{***}	-2.092^{***}	-1.419^{***}	-0.785^{***}
	(0.0357)	(0.606)	(0.399)	(0.0291)
Schwitzerland	0.124^{***}	0.257^{***}	0.257^{***}	0.127^{***}
	(0.0103)	(0.0857)	(0.0857)	(0.00953)
Cyprus	-0.643^{***}	-0.762^{***}	-0.762^{***}	-0.644^{***}
	(0.0419)	(0.0757)	(0.0757)	(0.0408)
Czech Rep.	-0.488^{***}	-2.865^{**}	-2.192^{**}	-0.512^{***}
	(0.0394)	(1.258)	(1.051)	(0.0193)
Germany	-0.352^{***}	-0.253^{***}	-0.253^{***}	-0.351^{***}
	(0.0199)	(0.0725)	(0.0725)	(0.0211)
Denmark	0.290^{***}	-0.620	-0.620	0.278^{***}
	(0.0145)	(0.560)	(0.560)	(0.0123)
Estonia	-0.410^{***}	-1.146^{***}	-0.473^{***}	-0.411^{***}
	(0.0181)	(0.241)	(0.0359)	(0.0176)
Greece	-1.489^{***}	-1.690^{***}	-1.690^{***}	-1.491^{***}
	(0.0456)	(0.120)	(0.120)	(0.0435)
Spain	0.193^{***}	0.0641	0.0641	0.191^{***}
	(0.0119)	(0.0823)	(0.0823)	(0.0115)
Finland	0.291^{***}	0.389^{***}	0.389^{***}	0.293^{***}
	(0.0147)	(0.0632)	(0.0632)	(0.0140)
France	-0.0385^{***}	-0.0476^{***}	-0.0476^{***}	-0.0386^{***}
	(0.0107)	(0.0106)	(0.0106)	(0.0106)
Croatia	-0.414^{***}	-2.229^{**}	-1.556^{**}	-0.430^{***}
	(0.0337)	(0.910)	(0.703)	(0.0207)
Hungary	0.205^{***}	-3.722^{*}	-3.049	0.159^{***}
	(0.0443)	(2.226)	(2.019)	(0.0100)
Ireland	0.282^{***}	0.304^{***}	0.304^{***}	0.282^{***}

	(0.0151)	(0.0114)	(0.0114)	(0.0151)
Iceland	0.707***	−2.064	−2.064	0.669***
	(0.0290)	(1.718)	(1.718)	(0.0262)
Italia	−0.577***	−0.590***	−0.590***	−0.577***
	(0.0327)	(0.0317)	(0.0317)	(0.0326)
Lihuania	−0.190***	−1.033***	−0.360***	−0.193***
	(0.0136)	(0.312)	(0.105)	(0.0120)
Luxembourg	0.177***	0.323***	0.323***	0.180***
	(0.0156)	(0.0967)	(0.0967)	(0.0156)
Latvia	−0.760***	−1.628***	−0.956***	−0.763***
	(0.0268)	(0.322)	(0.115)	(0.0248)
Malta	−0.0626***	−0.128***	−0.128***	−0.0634***
	(0.0151)	(0.0425)	(0.0425)	(0.0149)
Netherlands	0.570***	0.732***	0.732***	0.572***
	(0.0366)	(0.0999)	(0.0999)	(0.0350)
Norway	−0.266***	−1.195**	−1.195**	−0.279***
	(0.0328)	(0.571)	(0.571)	(0.0217)
Poland	0.403***	−1.031	−0.359	0.392***
	(0.0161)	(0.683)	(0.477)	(0.0229)
Portugal	−0.155***	−0.521**	−0.521**	−0.161***
	(0.0434)	(0.219)	(0.219)	(0.0403)
Romania	−0.900***	−2.709***	−2.036***	−0.916***
	(0.0332)	(0.904)	(0.697)	(0.0203)
Serbia	−0.189***	−3.618*	−2.945*	−0.228***
	(0.0456)	(1.913)	(1.706)	(0.0125)
Sweden	−0.143***	−1.287*	−1.287*	−0.158***
	(0.0302)	(0.704)	(0.704)	(0.0165)
Slovenia	0.371***	−0.0647	0.608***	0.374***
	(0.0197)	(0.0616)	(0.147)	(0.0172)

Slovakia	0	-0.673^{***}	0	0
	(.)	(0.208)	(.)	(.)
United Kingdom	0	0	0	0
	(.)	(.)	(.)	(.)
income_diff		0.556	0.556	0.00983
		(0.346)	(0.346)	(0.00801)
N	140515	140515	140515	140515
R^2				

Source: The data comes from EU-SILC 2013, contains only records of employees reporting their life satisfaction, and are weighted by the sample weights.
Notes: Standard errors in parentheses clustered at country-level. ***, **, and * denote statistical significance at the 1 %, 5 %, and 10 % level.

Appendix D

Additional results on Happiness Index

Table D.1: Differences in the country fixed-effect: Ordinary Least Square regression

	OLS	OProbit	Ologit
main			
lg_income	0.0236***	0.0123***	0.0225***
	(0.00743)	(0.00456)	(0.00769)
hour_worked	−0.00806***	−0.00492***	−0.00851***
	(0.00145)	(0.000833)	(0.00169)
underemployed	−0.317***	−0.183***	−0.321***
	(0.0648)	(0.0374)	(0.0710)
want_nmh	0.114***	0.0623***	0.109***
	(0.0202)	(0.00947)	(0.0211)
housework	−0.0574	−0.0442	−0.0664
	(0.0505)	(0.0273)	(0.0509)
other_reason	−0.154***	−0.0901***	−0.182***
	(0.0337)	(0.0221)	(0.0355)
elementary_work	−0.105***	−0.0575***	−0.119***
	(0.0235)	(0.0135)	(0.0230)
payunexp	0.454***	0.274***	0.479***
	(0.0291)	(0.0155)	(0.0235)
paymeat	0.416***	0.235***	0.415***
	(0.0481)	(0.0266)	(0.0444)
bad_living	−0.231***	−0.149***	−0.267***
	(0.0183)	(0.0122)	(0.0221)
crime	−0.366***	−0.224***	−0.397***
	(0.0291)	(0.0176)	(0.0303)
age	−0.0602***	−0.0380***	−0.0664***
	(0.00652)	(0.00371)	(0.00749)
age_sq	0.000643***	0.000411***	0.000717***
	(0.0000659)	(0.0000388)	(0.0000795)

married	0.110***	0.0666***	0.122***
	(0.0185)	(0.0111)	(0.0200)
female	−0.368***	−0.236***	−0.420***
	(0.0466)	(0.0276)	(0.0498)
child	−0.0518***	−0.0368***	−0.0691***
	(0.0154)	(0.0108)	(0.0200)
female_child	−0.00440	0.00404	0.0159
	(0.0348)	(0.0181)	(0.0297)
widow	−0.248***	−0.141***	−0.248***
	(0.0395)	(0.0238)	(0.0503)
friend	1.096***	0.621***	1.114***
	(0.0798)	(0.0488)	(0.0903)
health_limit	−0.766***	−0.453***	−0.779***
	(0.0438)	(0.0290)	(0.0543)
primary	−0.0926	−0.0530	−0.104
	(0.0843)	(0.0475)	(0.0931)
tertiary	0.0557**	0.0199	0.0369
	(0.0228)	(0.0161)	(0.0276)
temp_job	−0.0963***	−0.0585***	−0.102***
	(0.0240)	(0.0127)	(0.0204)
manager	0.0378*	0.0227*	0.0406*
	(0.0202)	(0.0134)	(0.0231)
own	−0.000558	0.000615	0.00882
	(0.0223)	(0.0151)	(0.0276)
Austria	0.344***	−0.113***	−0.226***
	(0.00841)	(0.00472)	(0.00803)
Belgique	−0.197***	−0.464***	−0.870***
	(0.0109)	(0.0162)	(0.0386)
Bulgaria	0.225***	−0.219***	−0.436***
	(0.0294)	(0.0208)	(0.0416)
Schwitzerland	0.457***	−0.0544***	−0.126***
	(0.00877)	(0.00416)	(0.00872)
Cyprus	−0.720***	−0.739***	−1.329***
	(0.0125)	(0.0262)	(0.0529)
Czech Rep.	−0.405***	−0.614***	−1.121***
	(0.0312)	(0.0295)	(0.0556)
Germany	−0.0704***	−0.406***	−0.734***
	(0.0102)	(0.0152)	(0.0326)
Denmark	1.011***	0.359***	0.639***
	(0.0182)	(0.0149)	(0.0309)
Estonia	0.218***	−0.226***	−0.417***
	(0.0169)	(0.0131)	(0.0246)
Greece	−0.424***	−0.557***	−1.067***
	(0.0146)	(0.0213)	(0.0499)
Spain	0.209***	−0.161***	−0.327***
	(0.0134)	(0.00859)	(0.0211)
Finland	0.506***	−0.0387***	−0.0987***
	(0.0123)	(0.00729)	(0.0129)

France	−0.230***	−0.462***	−0.850***
	(0.0169)	(0.0191)	(0.0425)
Croatia	−0.304***	−0.554***	−1.020***
	(0.0286)	(0.0282)	(0.0546)
Hungary	0.198***	−0.242***	−0.451***
	(0.0523)	(0.0347)	(0.0599)
Ireland	0.889***	0.285***	0.505***
	(0.0222)	(0.00711)	(0.0156)
Iceland	1.078***	0.392***	0.643***
	(0.0449)	(0.0257)	(0.0468)
Italia	−0.164***	−0.422***	−0.805***
	(0.0150)	(0.0195)	(0.0432)
Lihuania	−0.159***	−0.472***	−0.875***
	(0.0183)	(0.0212)	(0.0435)
Luxembourg	−0.254***	−0.484***	−0.893***
	(0.0128)	(0.0160)	(0.0371)
Latvia	0.622***	0.0482***	0.0736***
	(0.0240)	(0.0122)	(0.0216)
Malta	0	−0.322***	−0.592***
	(.)	(0.00718)	(0.0168)
Netherlands	0.751***	0.179***	0.272***
	(0.00983)	(0.0103)	(0.0169)
Norway	1.040***	0.376***	0.647***
	(0.0192)	(0.0198)	(0.0398)
Poland	0.418***	−0.0996***	−0.209***
	(0.0192)	(0.0125)	(0.0219)
Portugal	−0.212***	−0.421***	−0.817***
	(0.0218)	(0.0197)	(0.0433)
Romania	−0.144***	−0.444***	−0.853***
	(0.0238)	(0.0203)	(0.0409)
Serbia	0.702***	0.118***	0.189***
	(0.0461)	(0.0248)	(0.0435)
Sweden	0.867***	0.281***	0.506***
	(0.0210)	(0.0146)	(0.0317)
Slovenia	0.602***	0.0315***	0.0277***
	(0.0140)	(0.00450)	(0.0105)
Slovakia	0.325***	−0.158***	−0.313***
	(0.0147)	(0.0113)	(0.0202)
United Kingdom	0.478***	0	0
	(0.0117)	(.)	(.)
_cons	6.944***		
	(0.150)		
N	138918	138918	138918
R^2	0.171		
pseudo R^2		0.034	0.035

Source: The data comes from EU-SILC 2013, contains only records of employees reporting their life satisfaction, and are weighted by the sample weights.

Notes: Standard errors in parentheses clustered at country-level. ***, **, and * denote statistical significance at the 1 %, 5 %, and 10 % level.

Table D.2: Differences in the country fixed-effect: Ordinary Least Square regression

	OLS	OProbit	Ologit
main			
lg_income	0.0216***	0.0110**	0.0201**
	(0.00752)	(0.00463)	(0.00783)
hour_worked	−0.00810***	−0.00494***	−0.00855***
	(0.00146)	(0.000837)	(0.00170)
underemployed	−0.319***	−0.184***	−0.323***
	(0.0646)	(0.0374)	(0.0711)
want_nmh	0.113***	0.0613***	0.107***
	(0.0199)	(0.0101)	(0.0219)
housework	−0.0607	−0.0467*	−0.0705
	(0.0510)	(0.0277)	(0.0515)
other_reason	−0.153***	−0.0896***	−0.180***
	(0.0327)	(0.0211)	(0.0337)
elementary_work	−0.107***	−0.0585***	−0.120***
	(0.0235)	(0.0134)	(0.0231)
payunexp	0.456***	0.275***	0.481***
	(0.0287)	(0.0153)	(0.0233)
paymeat	0.416***	0.235***	0.415***
	(0.0480)	(0.0265)	(0.0442)
bad_living	−0.231***	−0.149***	−0.267***
	(0.0182)	(0.0121)	(0.0220)
crime	−0.366***	−0.224***	−0.396***
	(0.0288)	(0.0175)	(0.0299)
age15_25	−0.156	−0.135*	−0.204
	(0.127)	(0.0815)	(0.142)
age26_36	−0.369***	−0.264***	−0.434***
	(0.120)	(0.0778)	(0.142)
age37_47	−0.492***	−0.339***	−0.564***
	(0.114)	(0.0713)	(0.129)
age48_58	−0.512***	−0.348***	−0.578***
	(0.109)	(0.0671)	(0.122)
age59_69	−0.361***	−0.246***	−0.401***
	(0.113)	(0.0684)	(0.125)
married	0.103***	0.0621***	0.114***
	(0.0171)	(0.0106)	(0.0189)
female	−0.367***	−0.236***	−0.419***
	(0.0462)	(0.0273)	(0.0493)
child	−0.0630***	−0.0440***	−0.0818***
	(0.0152)	(0.0104)	(0.0191)
female_child	−0.00777	0.00171	0.0123
	(0.0348)	(0.0182)	(0.0297)

widow	−0.250***	−0.142***	−0.250***
	(0.0409)	(0.0251)	(0.0526)
friend	1.099***	0.622***	1.117***
	(0.0801)	(0.0489)	(0.0903)
health_limit	−0.768***	−0.454***	−0.782***
	(0.0436)	(0.0288)	(0.0539)
primary	−0.0938	−0.0538	−0.106
	(0.0844)	(0.0475)	(0.0930)
tertiary	0.0532**	0.0180	0.0337
	(0.0232)	(0.0165)	(0.0281)
temp_job	−0.0849***	−0.0510***	−0.0885***
	(0.0243)	(0.0128)	(0.0205)
manager	0.0353*	0.0211	0.0376
	(0.0200)	(0.0134)	(0.0229)
own	−0.000255	0.000988	0.00976
	(0.0212)	(0.0142)	(0.0254)
Austria	−0.724***	−0.112***	−0.226***
	(0.0422)	(0.00473)	(0.00772)
Belgique	−1.269***	−0.466***	−0.874***
	(0.0427)	(0.0152)	(0.0371)
Bulgaria	−0.849***	−0.222***	−0.444***
	(0.0363)	(0.0200)	(0.0401)
Schwitzerland	−0.611***	−0.0537***	−0.125***
	(0.0441)	(0.00414)	(0.00858)
Cyprus	−1.792***	−0.741***	−1.334***
	(0.0429)	(0.0260)	(0.0528)
Czech Rep.	−1.486***	−0.623***	−1.136***
	(0.0160)	(0.0287)	(0.0538)
Germany	−1.142***	−0.409***	−0.738***
	(0.0433)	(0.0147)	(0.0315)
Denmark	−0.0656**	0.353***	0.630***
	(0.0290)	(0.0157)	(0.0324)
Estonia	−0.854***	−0.228***	−0.421***
	(0.0318)	(0.0125)	(0.0237)
Greece	−1.500***	−0.563***	−1.077***
	(0.0414)	(0.0204)	(0.0483)
Spain	−0.870***	−0.167***	−0.339***
	(0.0423)	(0.00762)	(0.0195)
Finland	−0.567***	−0.0417***	−0.103***
	(0.0428)	(0.00735)	(0.0128)
France	−1.304***	−0.465***	−0.857***
	(0.0454)	(0.0182)	(0.0409)
Croatia	−1.380***	−0.558***	−1.029***
	(0.0225)	(0.0273)	(0.0530)
Hungary	−0.888***	−0.253***	−0.472***
	(0.0161)	(0.0338)	(0.0580)
Ireland	−0.183***	0.283***	0.500***
	(0.0468)	(0.00761)	(0.0166)

Iceland	0	0.385***	0.630***
	(.)	(0.0255)	(0.0461)
Italia	−1.242***	−0.428***	−0.816***
	(0.0449)	(0.0180)	(0.0405)
Lihuania	−1.231***	−0.475***	−0.880***
	(0.0324)	(0.0208)	(0.0429)
Luxembourg	−1.326***	−0.486***	−0.896***
	(0.0507)	(0.0152)	(0.0358)
Latvia	−0.450***	0.0456***	0.0691***
	(0.0324)	(0.0116)	(0.0206)
Malta	−1.067***	−0.321***	−0.592***
	(0.0445)	(0.00731)	(0.0174)
Netherlands	−0.321***	0.177***	0.268***
	(0.0476)	(0.0107)	(0.0176)
Norway	−0.0366	0.371***	0.638***
	(0.0273)	(0.0199)	(0.0399)
Poland	−0.659***	−0.105***	−0.219***
	(0.0304)	(0.0120)	(0.0207)
Portugal	−1.287***	−0.426***	−0.826***
	(0.0500)	(0.0191)	(0.0422)
Romania	−1.223***	−0.452***	−0.866***
	(0.0247)	(0.0198)	(0.0398)
Serbia	−0.383***	0.107***	0.169***
	(0.00874)	(0.0247)	(0.0432)
Sweden	−0.213***	0.273***	0.492***
	(0.0256)	(0.0147)	(0.0318)
Slovenia	−0.482***	0.0218***	0.0104
	(0.0412)	(0.00450)	(0.00872)
Slovakia	−0.749***	−0.161***	−0.320***
	(0.0388)	(0.0108)	(0.0192)
United Kingdom	−0.590***	0	0
	(0.0412)	(.)	(.)
_cons	7.162***		
	(0.151)		
N	138926	138926	138926
R^2	0.170		
pseudo R^2		0.034	0.035

Source: The data comes from EU-SILC 2013, contains only records of employees reporting their life satisfaction, and are weighted by the sample weights.

Notes: Standard errors in parentheses clustered at country-level. ***, **, and * denote statistical significance at the 1 %, 5 %, and 10 % level.

Table D.3: The impact of material prosperity on happiness: Model modifications

	OLS2	OLS3	OLS4	OLS5
lg_income	0.0236***	−0.0667	−0.0667	
	(0.00743)	(0.329)	(0.329)	
income_diff		0.0905	0.0905	0.0239***
		(0.330)	(0.330)	(0.00760)
hour_worked	−0.00806***	−0.00804***	−0.00804***	−0.00806***
	(0.00145)	(0.00145)	(0.00145)	(0.00146)
underemployed	−0.317***	−0.317***	−0.317***	−0.317***
	(0.0648)	(0.0645)	(0.0645)	(0.0653)
want_nmh	0.114***	0.114***	0.114***	0.114***
	(0.0202)	(0.0209)	(0.0209)	(0.0198)
housework	−0.0574	−0.0569	−0.0569	−0.0571
	(0.0505)	(0.0503)	(0.0503)	(0.0505)
other_reason	−0.154***	−0.153***	−0.153***	−0.154***
	(0.0337)	(0.0336)	(0.0336)	(0.0336)
elementary_work	−0.105***	−0.106***	−0.106***	−0.105***
	(0.0235)	(0.0223)	(0.0223)	(0.0237)
payunexp	0.454***	0.455***	0.455***	0.454***
	(0.0291)	(0.0308)	(0.0308)	(0.0290)
paymeat	0.416***	0.416***	0.416***	0.416***
	(0.0481)	(0.0483)	(0.0483)	(0.0481)
bad_living	−0.231***	−0.231***	−0.231***	−0.231***
	(0.0183)	(0.0183)	(0.0183)	(0.0184)
crime	−0.366***	−0.364***	−0.364***	−0.365***
	(0.0291)	(0.0258)	(0.0258)	(0.0291)
age	−0.0602***	−0.0601***	−0.0601***	−0.0602***
	(0.00652)	(0.00657)	(0.00657)	(0.00647)

age_sq	0.000643***	0.000642***	0.000642***	0.000643***
	(0.0000659)	(0.0000665)	(0.0000665)	(0.0000654)
married	0.110***	0.110***	0.110***	0.110***
	(0.0185)	(0.0184)	(0.0184)	(0.0185)
female	−0.368***	−0.367***	−0.367***	−0.367***
	(0.0466)	(0.0468)	(0.0468)	(0.0467)
child	−0.0518***	−0.0522***	−0.0522***	−0.0519***
	(0.0154)	(0.0155)	(0.0155)	(0.0155)
female_child	−0.00440	−0.00404	−0.00404	−0.00426
	(0.0348)	(0.0351)	(0.0351)	(0.0348)
widow	−0.248***	−0.248***	−0.248***	−0.248***
	(0.0395)	(0.0396)	(0.0396)	(0.0395)
friend	1.096***	1.096***	1.096***	1.096***
	(0.0798)	(0.0799)	(0.0799)	(0.0798)
health_limit	−0.766***	−0.766***	−0.766***	−0.766***
	(0.0438)	(0.0436)	(0.0436)	(0.0437)
primary	−0.0926	−0.0924	−0.0924	−0.0925
	(0.0843)	(0.0842)	(0.0842)	(0.0842)
tertiary	0.0557**	0.0564**	0.0564**	0.0558**
	(0.0228)	(0.0218)	(0.0218)	(0.0229)
temp_job	−0.0963***	−0.0970***	−0.0970***	−0.0963***
	(0.0240)	(0.0234)	(0.0234)	(0.0243)
manager	0.0378*	0.0379*	0.0379*	0.0378*
	(0.0202)	(0.0204)	(0.0204)	(0.0200)
own	−0.000558	−0.00138	−0.00138	−0.000801
	(0.0223)	(0.0229)	(0.0229)	(0.0223)
curtain	0.218***		−0.0421	0.203***
	(0.0169)		(1.588)	(0.0142)
Austria	0.344***	0.588***	−0.270	0.351***

	(0.00841)	(0.0497)	(1.690)	(0.00860)
Belgique2	−0.197***	0.0558***	−0.802	−0.188***
	(0.0109)	(0.0182)	(1.727)	(0.0113)
Bulgaria_dum3	0.00704	0.295	−0.520	−0.0177
	(0.0200)	(0.681)	(0.531)	(0.0216)
Schwitzerland	0.457***	0.709***	−0.149	0.465***
	(0.00877)	(0.0172)	(1.730)	(0.00907)
Cyprus	−0.720***	−0.508***	−1.366	−0.722***
	(0.0125)	(0.157)	(1.581)	(0.0125)
Czech Rep.	−0.622***	−0.506	−1.322	−0.692***
	(0.0184)	(1.306)	(1.157)	(0.0101)
Germany	−0.0704***	0.177***	−0.681	−0.0634***
	(0.0102)	(0.0313)	(1.710)	(0.0105)
Denmark	1.011***	1.094*	0.236	0.975***
	(0.0182)	(0.626)	(1.112)	(0.0106)
Estonia	0	0.383	−0.433**	0
	(.)	(0.328)	(0.178)	(.)
Greece	−0.424***	−0.226	−1.083	−0.429***
	(0.0146)	(0.208)	(1.530)	(0.0144)
Spain	0.209***	0.419**	−0.438	0.207***
	(0.0134)	(0.168)	(1.570)	(0.0133)
Finland	0.506***	0.753***	−0.105	0.513***
	(0.0123)	(0.0319)	(1.711)	(0.0127)
France	−0.230***	−0.000803	−0.859	−0.228***
	(0.0169)	(0.101)	(1.638)	(0.0168)
Croatia	−0.522***	−0.315	−1.130	−0.568***
	(0.0145)	(0.973)	(0.823)	(0.0103)
Hungary	−0.0200	−0.157	−0.973	−0.156***
	(0.0383)	(2.224)	(2.075)	(0.0184)

Ireland	0.889***	1.123***	0.265	0.892***
	(0.0222)	(0.0858)	(1.654)	(0.0221)
Iceland	1.078***	0.858		0.963***
	(0.0449)	(1.738)		(0.0152)
Italia	−0.164***	0.0653	−0.793	−0.161***
	(0.0150)	(0.100)	(1.638)	(0.0150)
Lihuania	−0.376***	−0.0107	−0.826***	−0.381***
	(0.00596)	(0.394)	(0.245)	(0.00624)
Luxembourg	−0.254***	0	−0.858	−0.246***
	(0.0128)	(.)	(1.738)	(0.0119)
Latvia	0.404***	0.766*	−0.0499	0.399***
	(0.00962)	(0.404)	(0.254)	(0.00952)
Malta	0	0.220*	−0.638	0
	(.)	(0.128)	(1.610)	(.)
Netherlands	0.751***	1.008***	0.150	0.761***
	(0.00983)	(0.0172)	(1.748)	(0.00932)
Norway	1.040***	1.119*	0.262	1.003***
	(0.0192)	(0.643)	(1.095)	(0.0101)
Poland	0.200***	0.469	−0.346	0.170***
	(0.00862)	(0.747)	(0.598)	(0.0112)
Portugal	−0.212***	−0.0404	−0.898	−0.225***
	(0.0218)	(0.303)	(1.435)	(0.0225)
Romania	−0.361***	−0.153	−0.969	−0.407***
	(0.0131)	(0.962)	(0.812)	(0.00851)
Serbia	0.484***	0.429	−0.387	0.370***
	(0.0329)	(1.931)	(1.781)	(0.0133)
Sweden	0.867***	0.912	0.0538	0.821***
	(0.0210)	(0.768)	(0.970)	(0.00985)
Slovenia	0.384***	0.816***		0.397***

	(0.0117)	(0.151)		(0.00863)
Slovakia	0.108***	0.501*	−0.315**	0.110***
	(0.0105)	(0.295)	(0.145)	(0.0100)
United Kingdom	0.478***	0.709***	−0.149	0.481***
	(0.0117)	(0.0923)	(1.647)	(0.0119)
_cons	6.944***	7.621**	8.479***	7.179***
	(0.150)	(3.344)	(1.611)	(0.170)
N	138918	138918	138918	138918
R^2	0.171	0.171	0.171	0.171

Source: The data comes from EU-SILC 2013, contains only records of employees reporting their life satisfaction, and are weighted by the sample weights.
Notes: Standard errors in parentheses clustered at country-level. ***, **, and * denote statistical significance at the 1 %, 5 %, and 10 % level.

Table D.4: The impact of material prosperity on happiness: Model modifications

	Oprobit2	Oprobit3	Oprobit4	Oprobit5
HI				
lg_income	0.0123***	−0.0715	−0.0715	
	(0.00456)	(0.234)	(0.234)	
income_diff		0.0840	0.0840	0.0126***
		(0.235)	(0.235)	(0.00469)
hour_worked	−0.00492***	−0.00490***	−0.00490***	−0.00492***
	(0.000833)	(0.000831)	(0.000831)	(0.000836)
underemployed	−0.183***	−0.183***	−0.183***	−0.183***
	(0.0374)	(0.0372)	(0.0372)	(0.0378)
want_nmh	0.0623***	0.0621***	0.0621***	0.0624***
	(0.00947)	(0.00978)	(0.00978)	(0.00925)
housework	−0.0442	−0.0438	−0.0438	−0.0440

	(0.0273)	(0.0272)	(0.0272)	(0.0273)
other_reason	−0.0901***	−0.0891***	−0.0891***	−0.0898***
	(0.0221)	(0.0222)	(0.0222)	(0.0220)
elementary_work	−0.0575***	−0.0579***	−0.0579***	−0.0574***
	(0.0135)	(0.0126)	(0.0126)	(0.0136)
payunexp	0.274***	0.275***	0.275***	0.274***
	(0.0155)	(0.0173)	(0.0173)	(0.0154)
paymeat	0.235***	0.235***	0.235***	0.235***
	(0.0266)	(0.0267)	(0.0267)	(0.0266)
bad_living	−0.149***	−0.149***	−0.149***	−0.149***
	(0.0122)	(0.0121)	(0.0121)	(0.0122)
crime	−0.224***	−0.223***	−0.223***	−0.224***
	(0.0176)	(0.0154)	(0.0154)	(0.0177)
age	−0.0380***	−0.0380***	−0.0380***	−0.0381***
	(0.00371)	(0.00374)	(0.00374)	(0.00368)
age_sq	0.000411***	0.000410***	0.000410***	0.000411***
	(0.0000388)	(0.0000391)	(0.0000391)	(0.0000384)
married	0.0666***	0.0664***	0.0664***	0.0665***
	(0.0111)	(0.0110)	(0.0110)	(0.0111)
female	−0.236***	−0.236***	−0.236***	−0.236***
	(0.0276)	(0.0276)	(0.0276)	(0.0276)
child	−0.0368***	−0.0372***	−0.0372***	−0.0369***
	(0.0108)	(0.0109)	(0.0109)	(0.0108)
female_child	0.00404	0.00437	0.00437	0.00414
	(0.0181)	(0.0184)	(0.0184)	(0.0182)
widow	−0.141***	−0.141***	−0.141***	−0.141***
	(0.0238)	(0.0238)	(0.0238)	(0.0238)
friend	0.621***	0.621***	0.621***	0.621***
	(0.0488)	(0.0488)	(0.0488)	(0.0488)

health_limit	-0.453^{***}	-0.453^{***}	-0.453^{***}	-0.453^{***}
	(0.0290)	(0.0288)	(0.0288)	(0.0289)
primary	-0.0530	-0.0528	-0.0528	-0.0529
	(0.0475)	(0.0476)	(0.0476)	(0.0475)
tertiary	0.0199	0.0205	0.0205	0.0199
	(0.0161)	(0.0154)	(0.0154)	(0.0162)
temp_job	-0.0585^{***}	-0.0592^{***}	-0.0592^{***}	-0.0584^{***}
	(0.0127)	(0.0122)	(0.0122)	(0.0129)
manager	0.0227^{*}	0.0228^{*}	0.0228^{*}	0.0227^{*}
	(0.0134)	(0.0136)	(0.0136)	(0.0134)
own	0.000615	-0.000148	-0.000148	0.000472
	(0.0151)	(0.0152)	(0.0152)	(0.0151)
curtain	-0.158^{***}		-0.209	-0.165^{***}
	(0.0113)		(0.145)	(0.0107)
Austria	-0.113^{***}	-0.101^{***}	-0.101^{***}	-0.111^{***}
	(0.00472)	(0.0305)	(0.0305)	(0.00450)
Belgique	-0.464^{***}	-0.444^{***}	-0.444^{***}	-0.461^{***}
	(0.0162)	(0.0588)	(0.0588)	(0.0162)
Bulgaria	-0.0609^{***}	-0.367	-0.158	-0.0753^{***}
	(0.0137)	(0.418)	(0.273)	(0.0141)
Schwitzerland	-0.0544^{***}	-0.0342	-0.0342	-0.0514^{***}
	(0.00416)	(0.0577)	(0.0577)	(0.00432)
Cyprus	-0.739^{***}	-0.757^{***}	-0.757^{***}	-0.741^{***}
	(0.0262)	(0.0527)	(0.0527)	(0.0264)
Czech Rep.	-0.457^{***}	-0.923	-0.714	-0.494^{***}
	(0.0223)	(0.863)	(0.718)	(0.0188)
Germany	-0.406^{***}	-0.391^{***}	-0.391^{***}	-0.404^{***}
	(0.0152)	(0.0468)	(0.0468)	(0.0152)
Denmark	0.359^{***}	0.221	0.221	0.338^{***}

	(0.0149)	(0.381)	(0.381)	(0.0125)
Estonia	-0.0682^{***}	-0.287^{*}	-0.0777^{***}	-0.0696^{***}
	(0.00728)	(0.169)	(0.0242)	(0.00703)
Greece	-0.557^{***}	-0.587^{***}	-0.587^{***}	-0.562^{***}
	(0.0213)	(0.0844)	(0.0844)	(0.0215)
Spain	-0.161^{***}	-0.180^{***}	-0.180^{***}	-0.163^{***}
	(0.00859)	(0.0549)	(0.0549)	(0.00878)
Finland	-0.0387^{***}	-0.0238	-0.0238	-0.0365^{***}
	(0.00729)	(0.0450)	(0.0450)	(0.00750)
France	-0.462^{***}	-0.463^{***}	-0.463^{***}	-0.462^{***}
	(0.0191)	(0.0198)	(0.0198)	(0.0192)
Croatia	-0.396^{***}	-0.778	-0.568	-0.421^{***}
	(0.0207)	(0.625)	(0.480)	(0.0184)
Hungary	-0.0843^{***}	-0.785	-0.576	-0.157^{***}
	(0.0276)	(1.515)	(1.370)	(0.0155)
Ireland	0.285^{***}	0.289^{***}	0.289^{***}	0.286^{***}
	(0.00711)	(0.00902)	(0.00902)	(0.00711)
Iceland	0.392^{***}	-0.0271	-0.0271	0.330^{***}
	(0.0257)	(1.170)	(1.170)	(0.00846)
Italia	-0.422^{***}	-0.424^{***}	-0.424^{***}	-0.422^{***}
	(0.0195)	(0.0203)	(0.0203)	(0.0196)
Lihuania	-0.314^{***}	-0.549^{**}	-0.340^{***}	-0.318^{***}
	(0.0142)	(0.216)	(0.0715)	(0.0141)
Luxembourg	-0.484^{***}	-0.462^{***}	-0.462^{***}	-0.481^{***}
	(0.0160)	(0.0660)	(0.0660)	(0.0157)
Latvia	0.206^{***}	-0.0325	0.177^{**}	0.202^{***}
	(0.00774)	(0.222)	(0.0767)	(0.00720)
Malta	-0.322^{***}	-0.331^{***}	-0.331^{***}	-0.323^{***}
	(0.00718)	(0.0285)	(0.0285)	(0.00726)

Netherlands	0.179***	0.204***	0.204***	0.183***
	(0.0103)	(0.0717)	(0.0717)	(0.00998)
Norway	0.376***	0.236	0.236	0.356***
	(0.0198)	(0.394)	(0.394)	(0.0172)
Poland	0.0583***	−0.266	−0.0568	0.0413***
	(0.00598)	(0.466)	(0.321)	(0.00342)
Portugal	−0.421***	−0.477***	−0.477***	−0.430***
	(0.0197)	(0.151)	(0.151)	(0.0204)
Romania	−0.287***	−0.667	−0.458	−0.312***
	(0.0134)	(0.619)	(0.474)	(0.0101)
Serbia	0.276***	−0.350	−0.141	0.214***
	(0.0211)	(1.307)	(1.162)	(0.00637)
Sweden	0.281***	0.108	0.108	0.256***
	(0.0146)	(0.481)	(0.481)	(0.0106)
Slovenia	0.189***	0.0162	0.225**	0.195***
	(0.00857)	(0.0418)	(0.104)	(0.00808)
Slovakia	0	−0.209	0	0
	(.)	(0.145)	(.)	(.)
United Kingdom	0	0	0	0
	(.)	(.)	(.)	(.)
N	138918	138918	138918	138918
R^2				

Source: The data comes from EU-SILC 2013, contains only records of employees reporting their life satisfaction, and are weighted by the sample weights.
Notes: Standard errors in parentheses clustered at country-level. ***, **, and * denote statistical significance at the 1 %, 5 %, and 10 % level.

Table D.5: The impact of material prosperity on happiness: Model modifications

	Ologit2	Ologit3	Ologit4	Ologit5
HI				
lg_income	0.0225***	−0.0867	−0.0867	
	(0.00769)	(0.436)	(0.436)	
income_diff		0.110	0.110	0.0229***
		(0.437)	(0.437)	(0.00772)
hour_worked	−0.00851***	−0.00849***	−0.00849***	−0.00851***
	(0.00169)	(0.00169)	(0.00169)	(0.00170)
underemployed	−0.321***	−0.321***	−0.321***	−0.321***
	(0.0710)	(0.0704)	(0.0704)	(0.0716)
want_nmh	0.109***	0.109***	0.109***	0.109***
	(0.0211)	(0.0213)	(0.0213)	(0.0207)
housework	−0.0664	−0.0658	−0.0658	−0.0661
	(0.0509)	(0.0505)	(0.0505)	(0.0508)
other_reason	−0.182***	−0.180***	−0.180***	−0.181***
	(0.0355)	(0.0355)	(0.0355)	(0.0354)
elementary_work	−0.119***	−0.119***	−0.119***	−0.119***
	(0.0230)	(0.0217)	(0.0217)	(0.0233)
payunexp	0.479***	0.480***	0.480***	0.479***
	(0.0235)	(0.0268)	(0.0268)	(0.0233)
paymeat	0.415***	0.415***	0.415***	0.415***
	(0.0444)	(0.0445)	(0.0445)	(0.0445)
bad_living	−0.267***	−0.267***	−0.267***	−0.267***
	(0.0221)	(0.0219)	(0.0219)	(0.0222)
crime	−0.397***	−0.396***	−0.396***	−0.397***
	(0.0303)	(0.0262)	(0.0262)	(0.0304)
age	−0.0664***	−0.0664***	−0.0664***	−0.0665***

	(0.00749)	(0.00755)	(0.00755)	(0.00744)
age_sq	0.000717***	0.000716***	0.000716***	0.000717***
	(0.0000795)	(0.0000802)	(0.0000802)	(0.0000791)
married	0.122***	0.122***	0.122***	0.122***
	(0.0200)	(0.0200)	(0.0200)	(0.0200)
female	−0.420***	−0.420***	−0.420***	−0.420***
	(0.0498)	(0.0500)	(0.0500)	(0.0499)
child	−0.0691***	−0.0696***	−0.0696***	−0.0692***
	(0.0200)	(0.0198)	(0.0198)	(0.0200)
female_child	0.0159	0.0163	0.0163	0.0160
	(0.0297)	(0.0302)	(0.0302)	(0.0298)
widow	−0.248***	−0.248***	−0.248***	−0.248***
	(0.0503)	(0.0503)	(0.0503)	(0.0503)
friend	1.114***	1.115***	1.115***	1.114***
	(0.0903)	(0.0903)	(0.0903)	(0.0903)
health_limit	−0.779***	−0.779***	−0.779***	−0.779***
	(0.0543)	(0.0541)	(0.0541)	(0.0542)
primary	−0.104	−0.103	−0.103	−0.104
	(0.0931)	(0.0927)	(0.0927)	(0.0930)
tertiary	0.0369	0.0377	0.0377	0.0370
	(0.0276)	(0.0265)	(0.0265)	(0.0277)
temp_job	−0.102***	−0.103***	−0.103***	−0.102***
	(0.0204)	(0.0202)	(0.0202)	(0.0205)
manager	0.0406*	0.0407*	0.0407*	0.0405*
	(0.0231)	(0.0234)	(0.0234)	(0.0230)
own	0.00882	0.00785	0.00785	0.00858
	(0.0276)	(0.0277)	(0.0277)	(0.0276)
curtain	−0.313***		−0.381	−0.327***
	(0.0202)		(0.270)	(0.0195)

country_dum1	-0.226^{***}	-0.211^{***}	-0.211^{***}	-0.223^{***}
	(0.00803)	(0.0586)	(0.0586)	(0.00780)
country_dum2	-0.870^{***}	-0.844^{***}	-0.844^{***}	-0.865^{***}
	(0.0386)	(0.113)	(0.113)	(0.0383)
country_dum3	-0.123^{***}	-0.630	-0.250	-0.149^{***}
	(0.0263)	(0.780)	(0.510)	(0.0280)
country_dum4	-0.126^{***}	-0.0997	-0.0997	-0.120^{***}
	(0.00872)	(0.109)	(0.109)	(0.00872)
country_dum5	-1.329^{***}	-1.353^{***}	-1.353^{***}	-1.334^{***}
	(0.0529)	(0.102)	(0.102)	(0.0533)
country_dum6	-0.808^{***}	-1.524	-1.143	-0.877^{***}
	(0.0401)	(1.611)	(1.342)	(0.0369)
country_dum7	-0.734^{***}	-0.714^{***}	-0.714^{***}	-0.730^{***}
	(0.0326)	(0.0895)	(0.0895)	(0.0325)
country_dum8	0.639^{***}	0.460	0.460	0.602^{***}
	(0.0309)	(0.714)	(0.714)	(0.0267)
country_dum9	-0.104^{***}	-0.496	-0.116^{**}	-0.106^{***}
	(0.0118)	(0.315)	(0.0464)	(0.0116)
country_dum10	-1.067^{***}	-1.106^{***}	-1.106^{***}	-1.075^{***}
	(0.0499)	(0.162)	(0.162)	(0.0505)
country_dum11	-0.327^{***}	-0.352^{***}	-0.352^{***}	-0.332^{***}
	(0.0211)	(0.102)	(0.102)	(0.0215)
country_dum12	-0.0987^{***}	-0.0795	-0.0795	-0.0947^{***}
	(0.0129)	(0.0838)	(0.0838)	(0.0130)
country_dum13	-0.850^{***}	-0.853^{***}	-0.853^{***}	-0.851^{***}
	(0.0425)	(0.0437)	(0.0437)	(0.0426)
country_dum14	-0.707^{***}	-1.312	-0.932	-0.753^{***}
	(0.0386)	(1.168)	(0.899)	(0.0368)
country_dum15	-0.138^{***}	-1.160	-0.779	-0.270^{***}

	(0.0456)	(2.828)	(2.559)	(0.0276)
country_dum16	0.505***	0.510***	0.510***	0.506***
	(0.0156)	(0.0171)	(0.0171)	(0.0157)
country_dum17	0.643***	0.0972	0.0972	0.531***
	(0.0468)	(2.185)	(2.185)	(0.0161)
country_dum18	−0.805***	−0.807***	−0.807***	−0.805***
	(0.0432)	(0.0443)	(0.0443)	(0.0432)
country_dum19	−0.561***	−0.975**	−0.595***	−0.568***
	(0.0285)	(0.403)	(0.135)	(0.0287)
country_dum20	−0.893***	−0.864***	−0.864***	−0.887***
	(0.0371)	(0.125)	(0.125)	(0.0365)
country_dum21	0.387***	−0.0320	0.349**	0.379***
	(0.0124)	(0.416)	(0.147)	(0.0111)
country_dum22	−0.592***	−0.605***	−0.605***	−0.595***
	(0.0168)	(0.0525)	(0.0525)	(0.0170)
country_dum23	0.272***	0.304**	0.304**	0.278***
	(0.0169)	(0.133)	(0.133)	(0.0165)
country_dum24	0.647***	0.464	0.464	0.610***
	(0.0398)	(0.737)	(0.737)	(0.0350)
country_dum25	0.105***	−0.426	−0.0457	0.0735***
	(0.0104)	(0.869)	(0.599)	(0.00681)
country_dum26	−0.817***	−0.889***	−0.889***	−0.832***
	(0.0433)	(0.284)	(0.284)	(0.0445)
country_dum27	−0.540***	−1.144	−0.764	−0.586***
	(0.0255)	(1.157)	(0.887)	(0.0226)
country_dum28	0.502***	−0.421	−0.0407	0.390***
	(0.0376)	(2.440)	(2.171)	(0.0103)
country_dum29	0.506***	0.280	0.280	0.460***
	(0.0317)	(0.902)	(0.902)	(0.0243)

country_dum30	0.341***	0.00740	0.388**	0.351***
	(0.0160)	(0.0774)	(0.193)	(0.0149)
country_dum31	0	−0.381	0	0
	(.)	(0.270)	(.)	(.)
country_dum32	0	0	0	0
	(.)	(.)	(.)	(.)
N	138918	138918	138918	138918
R^2				

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