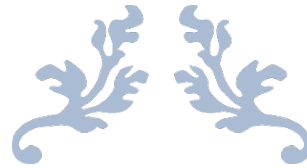




**Copenhagen  
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# THE ASSOCIATIONS BETWEEN WORKING TIME AND SUBJECTIVE WELL-BEING

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**EVIDENCE FROM SCANDINAVIA**



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## Abstract

Recently we have witnessed a widespread popular interest in exploring the potential benefits of adjustments to the current standard of full-time work, particularly in Scandinavia. However, there is yet no clear consensus in the relationship between working time and well-being. Furthermore, policy makers have come to acknowledge the need for alternative welfare indicators to GDP for policy decisions – such as measures of subjective well-being. On this basis, the primary purpose of this study has been to answer the following two research questions: (1) *What are the associations between usual working hours and subjective well-being?* (2) *What are the associations between match/mismatch of usual working hours and preferred hours and subjective well-being?* The motivation for the latter research question is that recent findings from outside Scandinavia have indicated that there might not be the length of the workweek per se that is of importance for well-being, but instead whether there exists a fit between an individual's *actual* working hours and *preferred* working hours. On the basis of this, our study also draws conclusions on whether such a statement holds in a Scandinavian setting, by partially replicating research from the UK and Australia. In investigating the research questions, we have built and tested hypotheses based upon economic theory. The associations between subjective well-being and working time were estimated by robust OLS methods, using representative cross-sectional data for the Scandinavian working population from 2010 obtained from the European Social Survey. The regression analysis consists of a main and complementary analysis, where the main analysis was conducted for men and women separately, whereas the complementary analysis investigated on a range of different subgroups for the female population. All the investigated associations were in reference to standard full-time work. Overall, the results suggest that part-time work is positively associated with subjective well-being for women, whereas subjective well-being for men is positively associated with working hours slightly below full-time, as well as working hours above standard full-time. However, the associations for the full female sample do not always, and in many cases not, hold once splitting the sample into different subgroups. Thus, the combined findings suggest that there does not exist any 'one size fits all' concerning working time. Our main results support the theory of the social production function, which implies that individual labour supply is determined as a trade-off between income, leisure and social approval. With regards to the thesis' second research question, we find no evidence of that a mismatch between actual and preferred working hours would be negatively associated with subjective well-being. With regards to the diverse associations between working time and subjective well-being for different groups, and that the associations indeed prove to be meaningful, we encourage policy makers to promote a higher degree of individual freedom in deciding labour supply.

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## List of Abbreviations

ALC	Americans' Changing Lives
BHPS	British Household Panel Survey
BLUE	Best Linear Unbiased Estimator
ESS	European Social Survey
EU	European Union
GDP	Gross Domestic Product
GSOEP	German Socio-Economic Panel
HH	Household
HILDA	Household, Income and Labour Dynamics in Australia
ISCO	International Standard Classification of Occupations
KLIPS	Korean Labor and Income Panel Study
OECD	The Organization for Economic Co-operation and Development
OLS	Ordinary Least Squares
OSA	Organisatie voor Strategisch Arbeidsmarktonderzoek
PE	Personal-Environment (fit)
SD	Standard Deviation
SWB	Subjective Well-Being
VIF	Variance Inflation Factors

# 1. Introduction

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*This thesis begins with a background that leads to the research questions of the study. This will be followed by our approach in answering the research questions. Lastly, the delimitations of the study will be explained and the structure of the rest of the thesis presented.*

## 1.1 Background

Many people would agree that one of the key aims of a society and its government should be to promote social welfare. As far back as Aristotle's time, well-being has been a concern for countless of philosophers. Aristotle's definition of the human goal is still widely known: "Happiness is the meaning and the purpose of life, the whole aim and end of human existence". According to Aristotle's Nicomachean Ethics, wealth does not represent a goal in itself but rather a means of achieving something else (Aristotle, 350 B.C.). Nevertheless, the gross domestic product (GDP) has throughout the times been the dominant measure of welfare and progress of societies. It has however been increasingly recognized that GDP alone is inadequate as a comprehensive welfare indicator (United Nations; Commission of the European Communities; International Monetary Fund; Organization for Economic Co-operation and Development; World Bank, 1993; The European Commission, 2007). While the GDP has risen steadily over the decades, national average life satisfaction has remained almost the same in Britain and reported levels of happiness have declined over the same period in the US (Blanchflower & Oswald, 2004). This fact supports the Easterlin paradox, which suggests that there is no significant link between a society's economic development and its average levels of happiness<sup>1</sup> (Easterlin, 1995). Oswald (1997) concluded that as economic forces have little impact on people's lives, economic growth should not be a government's primary concern.

The limitations of GDP to measure social welfare has stimulated a refocus of global progress measures in the direction of giving well-being greater importance. Over the recent years, there has been an upsurge in the number of alternative indicators and initiatives. In 2011, OECD launched the pioneering project OCED Better Life Initiative, with subjective well-being – i.e. how people think and experience their life – being an important component (OECD, 2013a). In connection to the launch of the European Commission's counterpart initiative, the Beyond GDP Conference in 2007 brought together over 650 international delegates to reinvent measures of progress, true wealth and well-being of nations (The

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<sup>1</sup> Among developed nations.

European Commission, 2007). A highlighted discussion point from the conference proceedings was brought forward by Bruno S. Frey, Professor of Economic Policy and Non-Market Economics at the University of Zurich. He argued that life satisfaction and happiness are acceptable and indeed appropriate objectives for government policy, with the suggestion that governments should focus on policies that enable people to pursue happiness (The European Commission, 2007).

There is a long history of regulations and political debate concerning working time and its impact on societal well-being. Working time policies in the early industrialization were based on subordination of the workers' lives to production demands, leading to the widespread adaption of the 12-hour day and reduction of holidays in Europe (Lee, McCann, & Messenger, 2007). The negative effects on health and productivity were slowly recognized, and the importance of leisure was gradually acknowledged – not least by Henry Ford who promoted the economic value of leisure. In the late nineteenth century, the idea of the eight-hour day gained further support, and its positive impact on productivity was reported in various pioneering experiments. Mobilized political pressures eventually resulted in the first international labour convention; the Hours of Work (Industry) Convention, 1919 (No. 1), which stipulates the principle 'eight hours a day and 48 hours a week' (Lee et al, 2007). This led way to a dramatic decline in the average working hours during the twentieth century. According to estimates for the industrialized countries 1870 to 2000, the average annual working hours have declined by more than half in many countries (Huberman & Minns, 2007). For example, the annual working hours in the Netherlands decreased from 3,274 in 1870 to 1,352 in 2000.

The political debate concerning working time remains highly topical today. Experiments with shorter workweeks at a range of private as well as governmental organizations around the world indicate a general interest in exploring the potential benefits to well-being, economy and the environment. New Economics Foundation has uncovered over twenty cases of Swedish organizations abandoning the standard workweek of 40 hours or eight-hours workday (New Economics Foundation, 2014). As an example, Kiruna District Council in Northern Sweden introduced a six-hours workday for its 250 employees as a short-term experiment in 1989, with the scheme being extended and lasted for 16 years. Due to lack of data, no concrete conclusions could be made regarding the effects on employee well-being or the economic situation (Kommunal, 2006).

A current Swedish experiment with reduced working time is carried out as a two-year controlled trial at the elderly care home Svartedalen in Gothenburg, commenced in the beginning of 2015. The experiment involves 68 nurses that have switched from a 40-hours to 30-hours workweek with remained

salary, funded by the City of Gothenburg to serve as guidance for the future of work (Pacta Guideline, 2016). The experiment has generated a great deal of public debate and received much media attention, not least internationally (e.g. BBC, 2016; Bloomberg, 2016; The New York Times, 2016; The Guardian, 2015; CNN, 2015). There is an overall clear interest in the potential gains by Svartedalen's working time reduction, which according to the first-year trial report include a sharp reduction in absenteeism, enhanced productivity and improved subjective well-being among the employees (Pacta Guideline, 2016). Recent working time reductions are however not limited to Sweden. For example, a software company outside Chicago, the US, switches to a 32-hour week for six months of the year (New Economics Foundation, 2014). TINE, Norway's largest producer of dairy products, introduced the six-hours workday in 2007 with the purpose to increase the quality of life for the employees (NRK, 2007).

Summarized, policymakers and academic researchers have during the last decades started to view well-being measures as reliable and important tools to provide guidance for policy. There is a long history of public debate concerning working time and its effect on employee well-being. While little has happened in terms of legislated working time reductions since the eight-hours day convention was introduced almost a century ago, there is a current wide-spread interest to explore the effects of working time. The seemingly general point of view is that working time below the standard 40-hours week could be beneficial to well-being, which is in line with the preliminary results of the current high-profile 30-hours workweek experiment at Svartedalen's elderly care home in Sweden (Pacta Guideline, 2016). To our knowledge, there is however no recent academic research on the associations between working time and well-being for the Scandinavian population, despite the broad interest.

## 1.2 Problem Statement and Research Questions

It was outlined in the background above that there is a current wide-spread interest in the associations between working time and well-being. While some case studies have been and are currently carried out at different organizations, no consensus has yet been reached for the relationship between working time and well-being for the Scandinavian population. According to prior research conducted for various populations including the UK, Australia and Germany, there is evidence of that individual preferences for working time can be even more importantly associated with subjective well-being (SWB) than the actual duration of work. Whether an individual's working hours match or not with his/her preferred hours has previously been shown to have significant associations with SWB (Angrave & Charlwood, 2015; Wooden, Warren & Drago, 2009; Wunder & Heineck, 2013). On the basis of this, the main objective of this thesis is to investigate the following two research questions<sup>2</sup>:

1. **What are the associations between usual working hours and subjective well-being?**
2. **What are the associations between the match/mismatch of usual working hours and preferred hours and subjective well-being?**<sup>3</sup>

The research will be carried out for two dimensions of SWB; happiness and life satisfaction. Usual working hours refer to OECD's definition of usual hours of work per week: "Usual hours of work per week identifies the most common weekly working schedule over a selected period of a person in employment" (OECD, 2003a). While both research questions will be examined for different intervals of usual working hours, the second research question also adds the element of whether there is a match between individual usual working hours and preferred working hours. From the results of the two research questions, we also aim to draw conclusions on which one that seem to be more importantly associated with SWB; Is it the length of the workweek in absolute terms (working time), or the fit between actual and preferred working hours (working time mismatch) that is most strongly associated with subjective well-being?

With the above in mind, the primary purpose of this thesis is to examine the associations between working time and SWB for a representative cross-section of Scandinavian workers. A growing body of research shows that high SWB levels are beneficial to the effective functioning of societies beyond the advantages to individuals (Matsumoto & Juang, 2016). Research on the potential relationships between

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<sup>2</sup> Hereafter also referred to as *research question 1* and *research question 2* respectively.

<sup>3</sup> The match/mismatch of usual working hours and preferred hours will also be referred to as *working time mismatch*.

working time and SWB can thus contribute to insights relevant for welfare policy and workplace practices. In line with the wide-spread interest in the associations between working time and well-being, we believe that this study can provide insights to policymakers in governmental institutions and private organizations, as well as individuals. If the results of this study are perceived as interesting, the authors hope to have inspired to further related research.

### **1.3 Approach**

In answering the research questions, we apply an extensive research design. The main motivation behind this is that we wish to complement the existing Scandinavian evidence on the associations between working time and well-being with academic cross-sectional evidence. The existing evidence typically consists of case studies, i.e. they apply an intensive research design. Although these studies provide valuable in-depth insights, for example with regards to causality (in which direction the associations go), the validity of the findings are however restricted to specific contexts and accordingly cannot be statistically generalized to the wider population. As we take on an extensive research approach by using large-scale data that consist of representative samples of the Scandinavian population, the associations between working time and subjective well-being can be analysed by applying quantitative methods. This allows for a statistical generalization of the findings to the population of interest, namely the working population in Scandinavia. Lastly, this research is further characterized as descriptive. Overall, this entails that our objective is to *describe* some of the associations between working time and SWB for the working population in Scandinavia, and that we do not intend to establish any causal relationships.

### **1.4 Delimitations to the Study**

#### **Delimitation 1: The population of interest is restricted to Scandinavia**

This study is delimited to examine the research questions with regards to only the Scandinavian countries, namely Denmark, Norway and Sweden (using a cultural definition). For a broader research, more countries could have been included. There are however three main reasons for the choice to restrict the population of interest to Scandinavia. Firstly, several of the most high-profile examples of experiments with working time reductions have been conducted in Scandinavia, proving a high interest. Secondly, there is seemingly a lack of relevant Scandinavian academic studies on the relationship

between working time and well-being. Lastly, we believe that the results and analysis of this study are more useful by keeping the population of interest relatively homogenous.

**Delimitation 2: The population of interest is restricted to the working population**

The population of interest is further restricted by only including the working population, which here is defined as working-age adults between 18 and 65 in paid work. This is based on that the results in this study are meant to contribute to policy implications concerning working time arrangements.

**Delimitation 3: No distinction is made between underemployment and overemployment for working time mismatch**

When assessing the association between SWB and working time mismatch, it is in the literature common to distinguish between underemployment and overemployment. Such a distinction signalizes in which direction the mismatch goes. This study does however not distinguish between underemployment and overemployment due to sample size restrictions. Consequently, respondents who are either underemployed or overemployed are analysed combined, and simply defined as “*mismatched*”.

**Delimitation 4: Only subjective concepts of well-being will be studied**

This study is carried out for the SWB measures life satisfaction and happiness. Thus, a delimitation is that only subjective concepts of well-being will be studied, and no comparison will be made with objective measures of the same concept to reassure validity.

**Delimitation 5: Pure focus on the associations between working time and subjective well-being**

A last delimitation in this study is that it only focuses on the aspect of associations between working time and SWB. As such, the study excludes analysis of any other aspects that might be relevant for policy implications concerning working time, such as productivity or other economic considerations.

## 1.5 Outline of the Thesis

This thesis is structured into ten main chapters, which are illustrated in Figure 1 below and followed by a summary of the content.

**Figure 1.** *Thesis structure*



This introductory chapter started with a background on the increased importance of subjective well-being for economic policy and the growing general interest in the relation between well-being and working time. This demonstrated the relevancy of the research objective of this study that was defined into two main research questions. Subsequently, we outlined the approach in answering the research questions. Lastly, the delimitations of the study were explained in terms of the reasons for certain restrictions and their implications.

The remainder of the thesis is structured as follows. In Chapter 2 we provide insights into the Scandinavian labour market, with focus on some selected key indicators such as employment rates, and the prevalence of part-time employment and long working hours. Additionally, we present some key definitions with regards to working hours. Chapter 3 presents an overview of happiness economics, i.e.



the broad concept in which subjective well-being research falls into. Examples of topics that are brought up in this chapter are the development of happiness economics, different measures of well-being, the common determinants of well-being, alongside methodological considerations that ought to be kept in mind for SWB research. In chapter 4 we present the theoretical framework for this study, with relevant economic theories that serve as the basis of the hypotheses that we intend to test in the later analysis. Chapter 5 provides in-depth insights into the prevailing literature on working time and working time mismatch, subsequently summarized into derived empirical regularities. Lastly, the chapter presents an elaboration on how our research fits into the literature, i.e. similarities and differences to the studies that we (partially) replicate. Chapter 6 presents the data that constitutes the basis for our analysis. We provide descriptive statistics for the variables of main interest in this study, followed by descriptive statistics for each country in the (eventually) pooled sample and the motivation for using a pooled sample for Scandinavia. Chapter 7 outlines the methodological approach in answering the thesis' research questions, and in particular, which methods and techniques that have been applied. In Chapter 8 we present the results of our analysis. First, we present the bivariate analysis of the variables of main interest, and later the main results followed by complementary regression analysis. Both the main and complementary regression analyses are based on the empirical model outlined in Chapter 7.2. Chapter 9 presents the discussion of the empirical findings. Specifically, we discuss how the results compare to previous research, which theories and hypotheses receive confirmation and the generalizability of the results. Furthermore, we discuss the wider implications of the results, policy recommendations, limitations and shortcomings of the study, and lastly suggestions for future research. At the very last, in Chapter 10, we present the concluding remarks of this thesis.

## 2. The Labour Market in Scandinavia

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*This chapter serves to provide a general background on the Scandinavian labour market. The reader should be aware that this section is not meant to give a comprehensive overview of all the features of the Scandinavian labour market. Instead, this section sheds light on some key indicators such as employment rates, and the prevalence of part-time employment and very long working hours (definitions will follow below), with the 28 European Union (EU) Member States (hereby EU-28) and OECD serving as a reference points.*

### 2.1 Key Indicators

**Table 1.** *Employment rates and proportion of the working population in part-time employment in Scandinavia and EU28, data from 2015.*

	Employment rate			Part-time employment		
	Total	Men	Women	Total	Men	Women
<b>DK</b>	73.5	76.6	70.4	24.7	15.6	34.7
<b>NO</b>	74.8	76.5	73.0	26.0	14.8	38.4
<b>SE</b>	75.5	77.0	74.0	24.3	13.2	36.3
<b>EU-28</b>	65.6	70.9	60.4	19.6	8.9	32.1

*Source:* Data for employment rate is adapted from Eurostat (2016a) while data for part-time employment is adapted from Eurostat (2016b). *Notes:* DK, NO and SE denote Denmark, Norway and Sweden respectively. The employment rate is defined as the proportion of the working age population (age 15 to 64) in employment, whereas part-time employment is defined as the percentage of the total employment. The distinction between part-time and full-time employment is based on a spontaneous response by the respondent (Eurostat, 2016c).

As shown in Table 1, the Scandinavian labour market stands out compared to the EU-28 in that there is a relatively high employment rate. There are however gender differences both in the Scandinavian and European labour markets. This is evident from the fact that in the EU-28, the proportion of women participating in the labour market is far lower than that of men. For the Scandinavian countries however, although the employment rate is lower for women than men, the proportion of women in employment is substantially higher in Scandinavia than in the EU-28. This aspect of the Scandinavian labour market is a result of an ongoing trend over the past decades where an increasing amount of women are entering the labour market. Overall, the high female labour market participation may potentially reflect these countries' welfare systems and opportunities within the countries (Aagestad, 2012). For instance, a possible explanation for this development is that there has been an extensive development of kindergartens and daycare centers in Scandinavia, which has facilitated for a higher participation in the

labour market on a general basis. Another possible explanation is the opportunity to be in part-time employment (both among men and women), in particular in phases when children are young. However, in spite of the fact that the employment rate for women is considerably higher in the Scandinavian countries compared to the average of the EU-28, a higher proportion of the women that are in employment are working part-time in Scandinavia. The proportion of men in part-time employment is also higher in Scandinavia than for the EU-28. Nonetheless, part-time employment is much more prevalent among women, both in Scandinavia as well as in the EU-28.

**Table 2.** *Proportion of the working population working very long hours (50 hours and above per week) in Scandinavia and OECD, data from 2016.*

<b>Very long hours</b>	
<b>DK</b>	2
<b>NO</b>	3
<b>SE</b>	1
<b>OECD</b>	13

*Source:* Data is obtained from OECD (2016a).

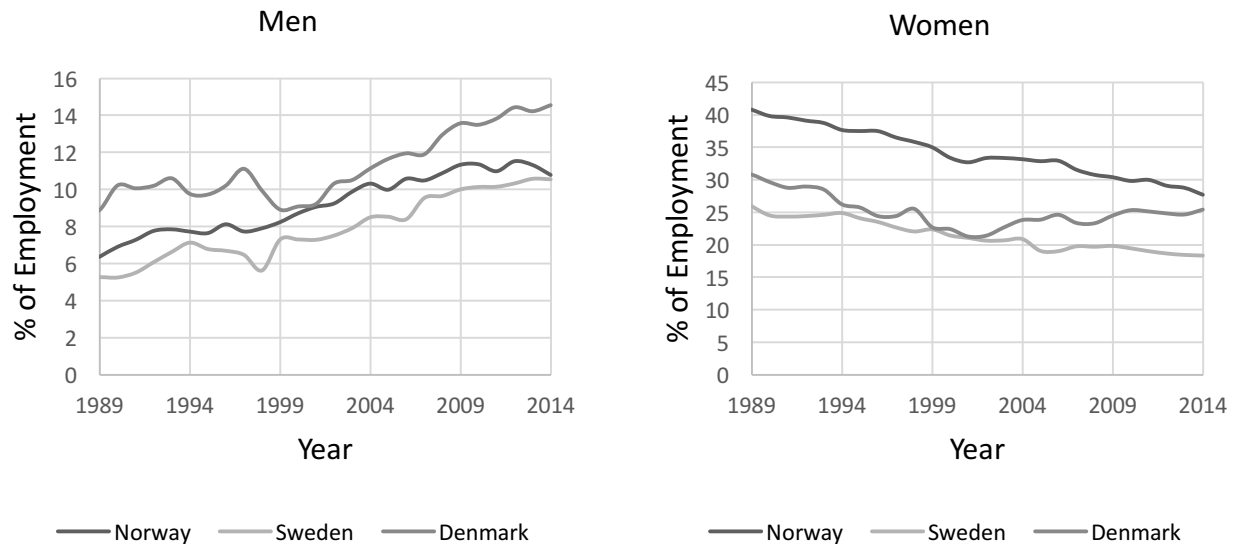
*Note:* DK, NO and SE denote Denmark, Norway and Sweden respectively.

As shown in table 2, the prevalence of very long working hours is substantially lower in the Scandinavian countries – here with the average of the OECD countries serving as reference.

To summarize this section, the Scandinavian countries have higher employment rates and higher female participation in the labour market compared to the average of the EU-28. That being said, part-time employment is substantially higher among both men and women in Scandinavia. There are however gender differences (both in Scandinavia and the EU-28) in that a higher proportion of women than men are part-time employed, and employment rates are overall higher for men. Lastly, very long working hours are much less common in Scandinavia compared to the average of the OECD countries.

## 2.2 Changing Labour Markets

**Figure 2.** Historical development of part-time employment rate in Scandinavia, for men and women, data from 1989 to 2014.



Source: Data for part-time employment rate is adapted from OECD (2016b). Note: Part-time employment is defined as working hours below 30 hours per week in main job, whereas full-time employment is defined as 30 hours or more per week in main job.

Figure 2 clearly illustrates that there have been great changes in the Scandinavian labour markets since the end of the 1980's with regards to part-time employment rates. Specifically, the part-time employment rate, i.e. the proportion of part-time employment out of total employment, has been decreasing for women, whereas increasing for men.

## 2.3 Usual versus Normal Hours of Work

As a starting point, we would like to point out that there exists a multitude of definitions with regards to working hours. We will in this section give a brief explanation of usual hours of work per week (as this is of main interest of this study) and how it differs from normal hours of work (per week), and describe how they apply in the Scandinavian countries.

Normal hours of work are determined by law and/or collective agreements (OECD, 2003b). Denmark, Norway and Sweden are obliged to adhere to the provisions on statutory maximum working time, set by the EU in the 2003 Working Time Directive (Eurofound, 2016). The directive sets a minimum standard

in relation to working time, with the objective of protecting workers' safety and health. Specifically, the directive entails a provision of a maximum 48-hour workweek on average, including any overtime, in addition to further requirements related to rest and leave periods. The normal hours of work in Norway and Sweden is 40 hours (in line with the majority of the EU member states), whereas the equivalent figure for Denmark is 48 hours. Lastly, it should be emphasized that individuals have the opportunity to opt-out of the provisions of the directive under a set of conditions, meaning that they can waive their right of the maximum weekly hours set by each country (Eurofound, 2016).

In contrast to normal hours of work, usual hours of work (per week) is defined as the number of hours an individual works during a normal week in his or her main job, overtime included (conditioned that it occurs on a systematic basis). The definition is applicable to all workers with regular schedules and also includes those who do not hold an employment contract (OECD, 2013b). Consequently, by applying the definition of usual hours of work per week<sup>4</sup> for the current study's research questions, we are able to identify "the most common weekly working schedule over a selected period of a person in employment" (OECD, 2003a).

**Table 3.** Usual working hours for workers in full-time respectively part-time employment, and total declared employment for Scandinavia, data from 2014.

<b>Usual working hours</b>	<b>DK</b>	<b>NO</b>	<b>SE</b>
Part-time employment	13.8	15.9	16.3
Full-time employment	38.3	38.8	39.7
Total declared employment	32.5	33.9	35.8

*Source:* Data for usual working hours is adapted from OECD (2016c). *Note:* DK, NO and SE denote Denmark, Norway and Sweden respectively. Part-time employment is defined as working hours below 30 hours per week in main job, whereas full-time employment is defined as 30 hours or more per week in main job.

In table 3 we see that the average usual working hours in Scandinavia for full-time employment are in the range of 38.3 to 39.7 hours, whereas the equivalent figure for part-time employment is 13.8 to 16.3 hours.

<sup>4</sup> Referred to as *usual working hours*.

### **3. Happiness Economics**

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*This chapter is meant to provide a relevant overview of happiness economics, which is the broad concept in which subjective well-being research falls into. Firstly, there will be a brief introduction to the historical development of happiness economics. Thereafter, focus will be on measurements of well-being, its usage for policy purposes and methodological considerations for research on subjective well-being. The chapter is concluded by a summary.*

#### **3.1 The Development of Happiness Economics**

The common opinion among economists has traditionally been that happiness<sup>5</sup> is not empirically measurable and thus studies on the subject are worthless (Van Praag & Ferrer-i-Carbonell, 2010). Until the early 2000's, publications in the field of happiness economics were rare (Frey & Stutzer, 2012). Easterlin can be seen as a front-runner with his classic paper on the relationship between economic growth and happiness published in 1974 (Easterlin, 1974). During the recent years however, the number of articles in happiness economics has nearly exploded. Happiness economics has emerged to one of the most thriving areas in current economics, mainly as a result of the widespread dissatisfaction with the traditional understanding of welfare in economics combined with the new opportunities to empirically study people's subjective well-being (Frey & Stutzer, 2012). Data on subjective well-being is now frequently used by economists to examine both macro- and micro oriented questions.

#### **3.2 Objective versus Subjective Measures of Well-being for Policy Purposes**

In order for any measurement of well-being to be useful in informing policy-making, three conditions must be satisfied – it must be theoretically rigorous, policy relevant and empirically robust. There are three main accounts of wellbeing that meet these conditions: (i) objective lists; (ii) preference satisfaction; and (iii) mental states (or subjective well-being) (Dolan, Layard, & Metcalfe, 2011). Based on this, Dolan et al. (2011) argue that all three main accounts of well-being are important for social policy. Although well-being in current study will be examined by subjective measures, it can be useful to be familiar with the distinction between the different accounts of well-being.

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<sup>5</sup> The terms *happiness* and *subjective well-being* are used interchangeably in this section.

Objective lists and preference satisfaction can both be classified as objective measures of well-being (Waldron, 2010). Objective lists are based on assumptions about basic human needs. Well-being is defined as the fulfilment of objective lists of what is supposed to provide people with the opportunity to live a 'flourishing' life, e.g. to have enough food to eat, to be free from persecution, to have a security net to fall back on etcetera. The preference satisfaction account can simply be expressed as that well-being is maximized when all of the individual's desires are fulfilled (Dolan et al., 2011). Broadly speaking, the aims of objective measures for public policy are either to improve objective circumstances such as health and education, or to increase people's choices by raising average incomes (Waldron, 2010). All else equal, more income (or GDP) allows people to satisfy their preferences to a higher degree, and thus GDP is often used as a proxy for well-being at the monitoring level (Dolan et al., 2011).

There is now increasing interest in the measurement of SWB for policy purposes (Dolan et al., 2011). SWB is measured as people's self-reported well-being, for example in terms of life satisfaction, happiness or psychological well-being. Questions designed for measuring SWB aim to measure how people think and feel about their own well-being. SWB is thus very different from the more traditional objective well-being indicators such as the level of educational achievement, employment, crime or material well-being (Waldron, 2010).

Waldron (2010) emphasises several advantages of using subjective measures of well-being over the use of objective measures. The main advantage of using self-assessed well-being is that paternalism, i.e. prescriptive questions that assume certain aspects to be good or bad for well-being, can be avoided. Instead, people's thoughts and feelings are placed at the centre of policy. Although objective measures may have a tendency to correlate with SWB, they generally only account for a small proportion of people's life satisfaction or happiness. Thus, objective measures can only provide part of the full picture, whereas SWB measures often are seen as getting to the heart of the issue (Waldron, 2010).

### **3.3 Measuring Subjective Well-being**

The literature offers a range of different classifications of the ways subjective well-being can be measured for policy purposes. We will use the version offered by Dolan et al. (2011), who distinguish between three broad categories of measure: (i) evaluation; (ii) experience; and (iii) 'eudemonic'.

Evaluation measures are conducted by asking people to provide global assessments of their life or domains of life (Dolan et al., 2011). Life satisfaction, which can be seen as an aggregate of various

domains, has been extensively used by economists for policy relevant research. The main reasons for this are the prevalence in international and national surveys and its comprehensibility and appeal to policymakers. General happiness represents another commonly used evaluative measure of well-being. Using happiness or life satisfaction generally yields very similar results in terms of the impact of key variables. There are however some notable differences, for example in relation to income (Dolan et al., 2011).

Experience as a measure for SWB is entirely determined by feelings held by the individual during some stated period of time (Dolan et al., 2011). Well-being is measured as the average balance of pleasure over pain over the relevant period. Evaluations and experience-based measures may sometimes produce similar results, but often they do not. 'Eudemonic' well-being can be seen as part of objective list in the sense that it is assumed that people have underlying psychological needs, such as autonomy and control, which contribute towards well-being independently of any pleasure they may bring. The 'eudemonic' measure is classified under SWB once it is made operational by that people are asked to evaluate how much meaning their lives have (Dolan et al., 2011).

Subjective well-being can be measured either by using a single-item scale or a multi-item scale (Frey & Stutzer, 2001). Experience, or the affective component of SWB, can be directly addressed by for example the multi-item affect scale from the Midlife Development Inventory (MIDI). MIDI evaluates positive and negative experiences according to asking the respondents to state how often at a 5-point scale they have experienced negative emotions (e.g. feeling nervous, restless, worthless) respectively positive emotions (e.g. feeling cheerful, calm, extremely happy) during the past 30 days. Evaluation measures of SWB are on the other hand most commonly measured at a single-item satisfaction scale. An example of such single-item measure is included in the Eurobarometer Survey ("On the whole are you satisfied, fairly satisfied, not very satisfied, or not at all satisfied with the life you lead?") (Frey & Stutzer, 2001).

The suitable amount of dimensions that a happiness index should contain depends on the purpose of the analysis (Frey & Stutzer, 2001). Multi-item scales generally have higher validity and reliability than single-item scales in the sense that random measurement errors tend to be smaller on average, and because of the broader range of components of SWB that are considered explicitly. Despite this, Frey and Stutzer (2001) argue that for most research, a common metric of the overall evaluation of life is suitable. For some psychological issues, a very differentiated approach may be necessary. But for the



purpose of economic research and happiness, quite simple questions and restricted scales are often sufficient.

### **3.4 Common Determinants of Subjective Well-being**

The growing body of SWB research has contributed to a broad understanding of the determinants of happiness and subjective well-being. Frey and Stutzer (2001) distinguish between five types of key determinants of happiness: (i) Personality factors, such as self-esteem, extraversion, optimism, personal control, and neuroticism; (ii) Socio-demographic factors, e.g. age, gender, marital status and education; (iii) Economic factors, such as individual and household income, the unemployment rate and inflation; (iv) Contextual and situational factors, such as particular employment and working conditions, and interpersonal relations with colleagues, relatives and friends, and; (v) Institutional factors, e.g. the extent of political decentralization and citizens' political freedom (Frey & Stutzer, 2001).

### **3.5 Methodological Considerations**

While there are numerous of methodological considerations for the study of subjective well-being, we have limited the following examples to crucial matters that are not related to how the survey has been carried out (survey design etc.). The reliability of the European Social Survey (ESS) data used in current study will instead be brought up in Chapter 5.

#### **3.5.1 Cardinal versus Ordinal Comparability**

It is important to understand the difference between cardinal and ordinal measures for the study of happiness research. Ordinal measures imply that responses are assumed to show the rank order of different answers on the SWB scale, but the relative difference between different answers on the satisfaction scale is unknown (OECD, 2013c). For example, with ordinal data a 5 is considered higher than a 4, and a 9 is considered higher than an 8. However, it is not possible to say anything about the relative size of the differences. For cardinal data it is assumed that the absolute magnitude of the response is meaningful, and that the difference between each step is the same over the whole scale. Hence, for any individual the difference in SWB between a 4 and a 5 is the same as the difference between an 8 and a 9 on the same scale (OECD, 2013c).

The suitable regression methodology depends on whether ordinal or cardinal comparability is assumed (Ferrer-i-Carbonell & Frijters, 2004). Empirical analyses of SWB that assume ordinal comparability commonly make use of latent variable models, such as ordered probit or logit. On the other hand, when SWB is assumed to be a cardinal measure, the empirical analysis is often carried out by ordinary least squares (OLS) or similar methods. Technically, most SWB measures are ordinal, but evidence suggest that treating them as cardinal and thus making use of OLS does not generally bias the results. The main practical advantage of the cardinality assumption is that it allows a straight-forward comparison between the changes in happiness scores and the changes in the observables (Ferrer-i-Carbonell & Frijters, 2004).

### **3.5.2 Reverse and Two-way Causality**

The direction of causality is crucial for establishing the policy-relevance for different drivers of subjective well-being. The ability to make causal inferences is strongest for the use of experimental data or data from randomised controlled trials (OECD, 2013c). Longitudinal data also has the potential to offer insights into likely causal relationships, as that allows to restrict the analysis to factors that temporally precede changes in SWB over time. For cross-sectional data sets, the ability to make causal inferences is severely limited. Hence, results from studies that make use of cross-sectional data should be interpreted alongside evidence about the direction of causality from other sources (OECD, 2013c).

Two-way or reverse causality and omitted variable bias both represent common causes of endogeneity, i.e. that the variables are correlated with the error term. If variables are endogenous, the OLS estimator will be inconsistent. It is commonly suggested to make use of instrumental variables to avoid issues with endogeneity (Stock & Watson, 2011, pp. 461-463). In practice however, it can be very cumbersome to identify appropriate instrumental variables (OECD, 2013c).

### **3.5.3 Omitted Variable Bias**

The problem of omitted variables is prevailing in econometric analyses. If the regressor is correlated with a variable that has been omitted from the analysis, which in turn partly determines the dependent variable, then the OLS estimates will suffer from omitted variable bias (Stock & Watson, 2011, pp. 221-228). In other words, omitted variable bias occurs when the following two conditions are true: (i) the omitted variable is correlated with the included regressor, and; (ii) the omitted variable is a determinant of the dependent variable. In the context of current study, the coefficients of the working hours variables will be biased if they correlate with an omitted variable, which in turn also correlates with the dependent variable for subjective well-being. In the presence of omitted variable bias, the estimated coefficient is

not a consistent estimator, and the bias persists even for large samples. Whether the bias is large or small depends on the size of the correlation between the regressor and the error term. The direction of the bias depends on whether the regressor and the error term are positively or negatively correlated (Stock & Watson, 2011, pp. 221- 228).

For data on subjective well-being specifically, it is in practice very hard to avoid omitted variable bias entirely concerning the many drivers that are part of explaining SWB outcomes (OECD, 2013c). Several counter-intuitive findings (e.g. the extensive evidence suggesting that increasing GDP does not seem related to SWB, despite strong cross-sectional relationships between income and well-being) could potentially be explained by omitted variable bias in econometric analyses (such as changes in relative income, or patterns of decline in other important determinants of well-being) (OECD, 2013c).

The omission of the individual time-invariant traits, or fixed effects, such as personality and temperament has often been discussed in relation to SWB research. Evidence suggests that individual fixed effects account for a sizeable proportion of the variance in SWB measures (Ferrer-i-Carbonell & Frijters, 2004). For cross-sectional data, it is sometimes proposed that measures of personality should be included as control variables in the regression analysis. There is however a risk of doing so, as the inclusion of personality traits as control variables could potentially reduce the effects of other important determinants and remove variance in SWB data that is likely to be of policy interest. For example, if long-term health problems influence survey answers to both personality and SWB questions, controlling for personality in the analysis could mask the true impact of long-term health problems on the SWB outcome (OECD, 2013c).

The general recommendation to deal with both the omitted variables issue related to personality and the issue of the direction of causality is to use longitudinal data, i.e. that a certain sample of individuals are repeatedly surveyed with regular time intervals (Ferrer-i-Carbonell & Frijters, 2004). Opposed to cross-sectional data, individual fixed effects can be controlled for with longitudinal data. Accounting for time-invariant unobserved factors has been shown to yield considerably more accurate regression estimates. By controlling for fixed effects, Ferrer-i-Carbonell & Frijters (2004) showed that the positive effect of income on SWB was reduced by approximately two-thirds. Having children, which has been commonly seen as a determinant of SWB, was found to be insignificantly positive when applying fixed effects, while significantly negative without fixed effects.

### **3.5.4 Generalizability of Results**

Analyses of the determinants of subjective well-being are strongly affected by the included variables in the model as well as the chosen sample, and both thus influence the extent to which results can be generalized to the population of interest (OECD, 2013c). The importance of different drivers of SWB may vary systematically between different subpopulations in accordance with certain group characteristics. Although studies have shown strong consistencies among affluent countries in terms of the direction and significance of some of the high-level determinants of SWB, it can be expected that there will be some differences between countries (OECD, 2013c).

The degree of heterogeneity in the relative size and significance of the determinants of SWB has implications for how analyses should be used to inform the public about the relative importance of different drivers (OECD, 2013c). Policies that aim to enhance SWB may also consider the distribution of SWB resource endowments among different population subgroups. For the interpretation of econometric results, it is important to keep in mind that the results hold for the average individual, meaning that in practice there may be broad individual differences in the specifics of the SWB function (OECD, 2013c).

### **3.5.5 What R-squared Should Be Expected?**

Senik (2011) reports that the share of happiness that can be explained by observable variables generally is small. A typical r-squared is reported to lie between 0.03 and 0.15 for OLS regressions, depending on the included control variables in the model. (Fleche, Smith, & Sorsa, 2011) explored the key life satisfaction drivers from the World Values Survey in an unbalanced panel between 1994 to 2008 for 32 different countries. The obtained r-squared values varied in the range 0.07 to 0.40 for the different countries, with an OECD average of 0.22. Considering the Scandinavian countries, Denmark and Norway had r-squared values of 0.23 and 0.24 respectively, while Sweden had an r-squared of 0.29 (Fleche et al., 2011).

## **3.6 Summary**

Summarized, subjective well-being as a measure fulfils the main conditions to be useful to inform policy making. Consideration should however be taken to how SWB is measured, e.g. whether a single-item or multi-item scale is being used, depending on the purpose of the study. There are also many methodological considerations that should be taken into account. Some considerations are less

important for the consistency of the results, such as whether cardinal or ordinal comparability is assumed, while some other considerations bear a greater importance, e.g. whether fixed effects are controlled for and the causal interpretation of the results.

## 4. Theoretical Framework

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*In this chapter we present the theoretical framework for this study, based on important economic theories related to labour supply. These serve as the basis for the hypotheses outlined in the end of the chapter.*

### 4.1 Economic Theory

Behind individuals' evaluation of their life satisfaction or happiness lies a cognitive assessment of to what extent their overall quality of life is judged in a favourable way. On the basis of this, Frey and Stutzer (2004) argue that reported subjective well-being, measured by representative surveys, constitutes a satisfactory empirical approximation to individual utility. Hence, it is beneficial to have a basic knowledge of theories on utility for the study of happiness research.

With the purpose of this study in mind, theories of individual labour supply are highly relevant. As an introduction, the standard neoclassical theory of individual labour supply will be presented, which explains the individual utility maximization problem as a trade-off between income and leisure. During the years, the traditional model has been enhanced in various ways to make the labour supply model more precise. Examples of model extensions include to account for household production, the collective dimension of decisions about labour supply (most often within the family), the life-cycle aspect, and the aspect of social approval. Due to space limitations, focus here will be on an extended model that accounts for the individual's strive for social approval, which is called the social production function. Theories that take social approval into account can help to explain the extensive empirical evidence on that work is not necessarily connected to disutility, as it is known that unemployed persons have among the lowest levels of SWB of all people (Van der Meer, 2014).

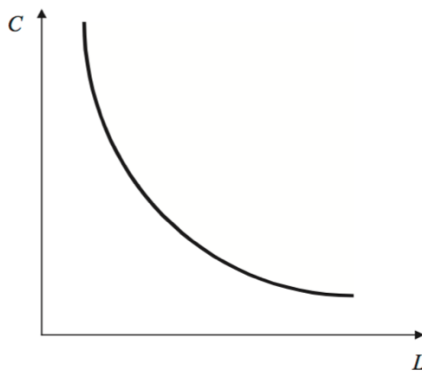
Besides theories of utility maximization and labour supply, there are other relevant theories that will be brought up in the theoretical framework. Social comparison does not only serve as an important element in the social production function, but it is also crucial for the theory of income aspiration. While the neoclassical theory of labour supply and the social production function are based on the assumption that all individuals act in accordance to utility maximization, the theory of bounded rationality contradicts this by introducing biases that lead individuals to make choices that are suboptimal to their utility or well-being. The later part of the theoretical framework on personal-environment fit explains how the degree of fit between individual preferences and actual circumstances, here with focus on working hours, can influence well-being.

### 4.1.1 The Neoclassical Theory of Labour Supply<sup>6</sup>

The neoclassical theory of labour supply represents the traditional explanation of the factors that determine the individual's participation in the labour market in terms of the supplied hours of work. The theory is based on the individual's choice between consuming more goods and consuming more leisure, the latter being defined as time spent outside work. Work is seen as a necessity to create income for consumption. Individuals can allocate their time either on work or on leisure, with the aim to maximize utility by choosing their optimal labour supply. The model relies on the idea that each individual has the possibility to make trade-offs between consumption and leisure.

At the individual level, the trade-off can be described in terms of utility functions proper to each individual, that is  $U(C, L)$ , where  $C$  and  $L$  designate the consumption of goods and leisure respectively. The model relies on the assumption that the individual desire to consume the greatest possible quantity of goods and leisure, which means that the utility function increases with each argument. Moreover, a certain level of utility can be obtained by different combinations of consumption and leisure. The set of pairs  $(C, L)$  that imply the same level of utility  $\bar{U}$ , i.e. such that  $U(C, L) = \bar{U}$ , can be illustrated by indifference curves. An example is shown in Figure 3, with the curve's properties directly following those of the utility function.

**Figure 3.** Example of an individual's indifference curve between consumption ( $C$ ) and leisure ( $L$ ).



Source: The illustration is obtained from Cahuc and Zyllerberg (2004).

<sup>6</sup> This section is based on "Labour Economics" chapter 1 by Cahuc and Zyllerberg (2004).

The slope of an indifference curve is always negative, as this signalizes that the utility function increases in relation to each of the components  $C$  and  $L$ . The slope at a given point defines the marginal rate of substitution between consumption and leisure. This implies the quantity of goods that the consumer must sacrifice in exchange for an hour of supplementary leisure, in order for the individual utility to remain unchanged. The marginal rate of substitution diminishes with leisure time, which means that the individual is willing to renounce less and less consumption for an extra hour of leisure as the time dedicated to leisure increases.

The amount of consumption of goods  $C$  is determined by the individual's income. Th (Van der Meer, 2014) (Van der Meer, 2014) (Van der Meer, 2014)e income can be obtained from paid work and from other activities outside the labour market. If we designate the real hourly wage by  $w$  and the amount of working hours  $h$ , the income from wages totals  $wh$ . The part of the income coming from activities outside the labour market may include investment income and transfer income, with the set of these resources being integrated under the designation  $R$ . For married or cohabiting persons, a part of  $R$  may consist of the partner's income.

The individual budget constraint takes the following form:

$$C \leq wh + R$$

This implies that the consumption cannot exceed the total income. The constraint can also be expressed in the following manner:

$$C + wL \leq R_0 \equiv wL_0 + R$$

The latter expression for the budget constraint is based on the fiction that the individual disposes of a potential income  $R_0$ , which hypothetically can be obtained by dedicating all time to paid work. Based on this concept, the individual buys leisure and consumer goods with the potential income. From this point of view, the wage corresponds equally to the price of goods and the opportunity cost of leisure. Each individual will maximize their utility subject to the budget constraint. The individual's choice between goods and leisure is expressed as the following:

$$\max_{\{C,L\}} U(C, L) \quad \text{subject to the budget constraint} \quad C + wL \leq R_0$$

The utility maximization problem can be explained further in terms of e.g. interior solutions and the reservation wage. For the scope of this study, we will however conclude this section here and move on to the next theory, which represents an extension of the current one.



#### 4.1.2 The Social Production Function<sup>7</sup>

The social production function represents one possible extension of the neoclassical utility function that was presented in the previous section. Van der Meer (2014) argued that the standard utility function for labour supply is insufficient in modelling the full utility loss connected to unemployment, since it contains only income and hours of work. This means that the social and psychic costs of being unemployed are not accounted for in the model, which has proven to be of great importance for explaining why unemployment can have such severe negative effects on subjective well-being. The social production function takes these aspects into account by the model's two ultimate goals that the individual wants to maximize, which is physical well-being and social approval, given the constraints of time and health. The two goals combined can be seen as SWB measures by questions about happiness or life satisfaction. In this function, physical well-being is mainly dependent on stimulation and comfort, while social approval is obtained by a combination of status, behavioural confirmation and affect. Hence, social approval is a main component of the individual's utility maximization problem in the social production function.

This approach to utility means that having a job produces SWB along at least three different paths. The three paths are the following: (i) the stimulation and comfort that comes with job satisfaction and income, (ii) the status that comes with the job, and; (iii) the behavioural confirmation on social approval, as being employed implies to conform to societal values and norms. Thus, the loss of a job also implies a loss in social approval, which cannot be compensated for even with a high level of unemployment benefits. Consequently, the SWB of the unemployed individuals will be lower than that of employed individuals (all else equal), even if the job loss does not lead to an income loss.

The effect of behavioural confirmation depends on the norms in the prevalent society or environment. Furthermore, there is evidence of that there is a gender difference in the effect of unemployment on SWB due to that norms are incorporated in the social production function. Men are reportedly affected more severely by unemployment than women. Married men with responsibilities as breadwinner report greater mental distress from becoming unemployed than married women, for whom marriage seemingly acts as a buffer.

Van der Meer (2014) claims that the difference in effect of unemployment on social well-being for men and women can be explained by a further specification of the social production function. First, we see a difference in physical well-being. Due to specialization effects, women traditionally participate in the

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<sup>7</sup> This section is based on Van der Meer (2014).

labour market less often than men and on average they work shorter hours when they participate. This implies that a job loss results in a smaller decrease in income and physical well-being for women than men. It also implies that once income is controlled for, or alternatively the proportional contribution to the household income, we should see a reduction in the difference between the effect for men and women. But as previously described, the income loss is just one out of several aspects connected to the SWB reduction for becoming unemployed. The level of job satisfaction, measured by stimulation and comfort in the job, does differ for men and women, and the sign of the difference also differs between different countries. The drop in social approval related to unemployment consists of status, behavioural confirmation and affect. Affect produces no obvious difference between men and women, but status and behavioural confirmation do.

There is an important difference in how men and women obtain status, which partly is due to the societal norms. Status depends on the relative position of men and women in the society. The relative position can be obtained in various ways, either directly by obtaining access to scarce resources via the job. Men can increase their own status by obtaining a high job status, which comes from having a job that is relatively scarce in society. Furthermore, the job also must provide access to scarce resources that allows to live a good life and also show the surroundings that one has a good job and life. Highly paid jobs that are relatively scarce provide a higher status, and thus finding a good position in the labour market increases individuals' status – both for women and men. But women also have another source of status, namely that they can access status via their husband's status. A partner in paid work gives the wife the opportunity to fall back on and seek employment to fulfil social approval. This is a reason for why it has been shown empirically that women suffer much less from a status loss than men once they become unemployed. This holds at least for married and cohabiting women.

Another important difference in the effect work has on SWB for men and women is connected to the social confirmation of that one's behaviour is according to societal norms. Despite female advancement on the labour market (as shown in Figure 2, Chapter 2) and in other areas, and despite stronger male involvement in the family domain, it is yet well documented that the societal norms concerning men and women still differ. In many societies it is still the norm that men more often have the role of the breadwinner within the family, whereas women more often carry the role as the homemaker. As men that lose their jobs get problems to comply to the norm of providing the main part of the income, they do no longer conform, or at least to a lesser extent, to the norm. In this way they lose their behavioural confirmation. On the other hand, women who become unemployed suffer much less as unemployment does not necessarily have to mean that they will deviate that much from the norm, as more time can be

spent on being the homemaker. It should however be noted that these theories are becoming less relevant as the society develops and is becoming more equalized. It is now increasingly expected that women take up a job, though it might be part-time job. In general, it still holds that unemployment affect men's SWB to a larger extent than for women. Due to the centrality of work for men's overall lives, paid work also has a much greater importance for men than women. The severe consequences for SWB for men holds especially for married or cohabiting men, while smaller differences in consequences are to be expected between single men and women.

It is important to note that the statements above are based on general findings from different research, but that the size and gender differences of the effects depend on the norms and values in the family and the society. These norms differ between countries; as do they differ within countries. For families with more modern norms, i.e. it is not expected of women to be the only homemaker or the men not to be the breadwinner, then it can be expected that the differences between women and men are smaller. Hence, it can be anticipated that the gender difference of the effect of unemployment on SWB will be smaller in modern families than in more traditional families.

#### **4.1.3 Theory of Bounded Rationality**

Many economic models rely on the assumption that agents are on average rational in their decision making, and for larger sample sizes they can be approximated to act according to their preferences. The assumption of rationality is the core of choice-based theories relying on utility-maximizing individuals, as in the two theories presented above. However, Simon (1955) relaxed this assumption by proposing that decision makers should be viewed as bounded rational, implying that rationality is limited by the available information, the traceability of the decision problem, the cognitive limitations of their minds, and the time available to make the decision. According to this view, decision makers seek for a satisfactory solution rather than an optimal one (Simon, 1955).

The concept of bounded rationality has subsequently gained widespread support. Kahneman (2003) mapped bounded rationality by exploring the systematic biases that separate the beliefs that people have and the choices they make from the optimal beliefs and choices assumed in rational-agent models. Kahneman's explanation of bounded rationality is based on three main aspects. First, people use heuristics and are prone to biases in various tasks of judgment under uncertainty. The second one is concerned with prospect theory, a model of choice under risk. The third one deals with framing effects and their implications for the rational-agent model (Kahneman, 2003). Overall, the theory of bounded rationality, mainly based on the cognitive limitations of the human mind, can help explain why decision

makers in reality do not always act according to the optimal choice and thus not according to their preferences.

#### **4.1.4 Income Aspiration and Habituation to Income**

As described in the theory of the social production function, a higher income brings both consumption benefits and status benefits to the individual. Nonetheless, the broad consensus in the literature is that relative income, as opposed to absolute income, is a much more important determinant for subjective well-being. Centers and Cantril (1946) studied the implications of economic stratification, i.e. to what extent members of various income groups are content with their present earnings and to what incomes they ultimately aspire. They found that over one-half of the population is dissatisfied with their income, and among these it is generally true that the more money a person has, the more money he/she wants. Though there is a decrease in relative income aspiration as income increases, the absolute income aspiration increases with income (Centers & Cantril, 1946). This phenomenon is explained by that the individual's present earnings provide a frame of reference by means of which he/she sets the individual aspiration and judges his/her needs, a concept that is commonly called habituation to income.

The main findings of Centers and Cantril (1946) also include that occupational and educational differences are subordinated to income as a reliable index to income satisfaction and aspirations. Dissatisfaction clearly varies with the income group, rather irrespective of education and occupation within each income group. However, despite that there is little variation by education in the percentage satisfied, there are sizable differences by education in the "increase wanted", i.e. their income aspiration, by those who are dissatisfied. Persons with relatively high education and with incomes that are high in relation to the population as a whole are most likely to come into close social contact with individuals far above them economically, which will constitute the reference group for identification and thus raise income aspiration (Centers & Cantril, 1946). This demonstrates the importance of social comparison for income aspiration.

To summarize, individuals' income aspirations are mainly determined by how they perceive their present earnings relative to others through social comparison, and relative to their past income via habituation.

#### **4.1.5 Person-Environment Fit Theory**

The person-environment (PE) fit theory takes a different approach to utility or well-being maximization than the previous theories. PE fit is broadly defined as the compatibility between the employee and the work environment that occurs when their characteristics are well matched. Theories on PE fit predict

that employee job performance and well-being will be higher where PE fit exists, and the opposite relation is expected when there is a misfit between preferences and job characteristics (Kristof-Brown, Zimmerman, & Johnson, 2005).

There are several distinct meanings of “fit”. Kristof-Brown et al. (2005) empirically summarize the literature into four critical domains of PE fit; person-job, person-organization, person-group and person-supervisor fit. The person-job fit is further divided into demands-abilities fit, in which the employee’s skills and abilities corresponds to the job requirements, and the second form of person-job fit occurs when the employee’s needs, desires or preferences are met by the job. The latter type of fit, commonly labelled needs-supplies fit, is of interest for the second research question in current study as it concerns the match between employee preferences for working time and actual circumstances in terms of usual working hours. Where misfit occurs, the unmet need becomes a source of stress and thus reduces well-being. The PE fit theory predicts that underemployment results in unmet needs, for example in terms of financial needs, work-related social needs or the need to maintain work-related social identities. On the other hand, overemployment implies the unsatisfied need for non-work time. Beyond that person-job fit has proven to be positively associated with well-being, it is also strongly correlated with three primary attitudes studied in the fit-literature; job satisfaction (0.56), organizational commitment (0.47) and intent to quit (-0.46) (Kristof-Brown et al., 2005).

It is common to distinguish between three types of fit by how it is being measured: (i) *perceived fit*, when an individual is asked to assess fit through direct comparison of P (person) and E (environment), (ii) *subjective fit*, when an individual is asked to report perceived fit by indirectly assessing fit through separate ratings across specific P and E dimensions, and; (iii) *objective fit*, which is calculated indirectly through the comparison of P and E variables as reported by different sources (Kristof-Brown et al., 2005). Objective fit thus means that the assessment is free from the bias of human perception, but the question of what constitutes an objective measure is a complex one (Caplan, 1987). The terms perceived fit and subjective fit, which are assessed by the individual him/herself, are often used interchangeably. However, the cognitive processes underlying each of the three measures of fit may differ, depending on the person. For an individual with a high degree of contact with reality (i.e. evaluates the environment accurately) and an accurate self-assessment, the three types of fit should have similar relationships with criteria. In practice, however, they are often only weakly related (Kristof-Brown et al., 2005). In current study, working time mismatch is measured through perceived fit since the respondents are asked directly to state their preferred working hours and their usual working hours.

It is likely that perceived, subjective and objective fit differ not only in how they are measured but also in what they represent conceptually. A possible explanation is the individuals' propensity to interpret environmental cues in ways that allow them to maintain a positive self-concept, in line with self-perception theory and cognitive dissonance theory. Hence, perceived fit allows the greatest level of cognitive manipulation since the assessment is all done in the head of the respondent. This allows individual differences in importance or salience of various dimensions to be captured in their ratings (Kristof-Brown et al., 2005).

Caplan (1987) described the PE fit as U-shaped curves with employee strain or ill-being on the vertical axis and PE fit on the horizontal axis. The curves minimize at the PE fit, meaning that employee well-being is reduced the further away the individual preferences are from the job characteristics. Caplan (1987) suggested modifications to the standard curves where P exactly equals E in the point of PE fit. For example, the U-shaped curves can be broadened at the base to represent the assumption that there is an interval of tolerance surrounding "P equals E" and that a certain amount of poor PE fit will be tolerated. Strain, or reduced well-being, then begins to increase only beyond the boundaries of the interval.

Lastly, it should be pointed out that the PE fit framework only provides predictions for research question 2 about working time mismatch, but not for research question 1 concerning working time. The hypothesized relation between PE fit and strain does not examine the amount of work load the person has per se, for in that case the person's individual need for work load is not considered.

## 4.2 Hypotheses

On the basis of the theoretical framework outlined so far in this chapter, we will now present the hypotheses that we intend to test in this study.

According to the neoclassical theory of labour supply, the worker experiences a trade-off between leisure time and income (to be used for the consumption of goods). As income, both in absolute and subjective terms, will be controlled for in the regressions of current study, we expect to see less indications of this trade-off. Thus, we expect that the utility or well-being that comes with leisure to dominate, and on that basis we formulate the following hypothesis:

### Hypothesis 1

*Conditionally that income is accurately controlled for, subjective well-being decreases with the working hours, as it implies less leisure time.*

We would like to emphasize that the above hypothesis completely relies on that income has been accurately controlled for in the regressions, as else the SWB is maximized by a trade-off between income and leisure.

The hypothesis formulated above with regards to the neoclassical theory of labour supply might however not hold when accounting for the extended model of labour supply, namely the social production function. According to this theory, the trade-off is not only between income and leisure, but also between social approval. It was previously explained that conforming to the societal norm is an important element in social approval. This can explain why having a job is important for SWB, as that implies to conform to the norm. In applying the social production function in the context of working time, it may be assumed that conforming to the norm is important also in terms of the amount of working hours. Hence, it can be expected that a higher social approval and SWB can be obtained by working what is generally considered as a 'normal' amount of working hours. As the statistics show that full-time employment is the most common set of working hours among both men and women (both in terms of the population as a whole as well as later will be shown for our sample), and if we assume that social approval is dependent on conforming to the norm in terms of working time for both men and women, we first formulate the following hypothesis based on the social production function:

## **Hypothesis 2**

*Full-time employment is associated with higher levels of subjective well-being, compared to part-time employment, as it implies a higher conformity of the prevailing social norms in terms of working hours.*

We also wish to present another hypothesis connected to the theory of the social production function, partly contradicting the hypothesis above, which accounts for the possibility of different results for the male and female sample. In the social production function, it was described that being unemployed is much more detrimental for SWB for men than women, as it implies a larger discrepancy from the norm for men. Being unemployed as a woman does not necessarily have to mean too much deviation from the norm. We saw in Table 1 in Chapter 2.1 that part-time work is much more common for women than men, and it can be expected that the norms are partly gender dependent. In such case, it might be that the trade-off between leisure and social approval is smaller for women than men. On the basis of this, we present the following hypothesis based on the theory of the social production function:

## **Hypothesis 3**

*Part-time employment is associated with higher levels of subjective well-being among women, compared to full-time employment, as women can retain social approval while having more leisure time.*

*Full-time employment is associated with the highest levels of SWB among men, based on the assumption that it is harder for men to retain social approval while having more leisure time.*

According to the person-environment fit theory, none of the hypotheses above would be valid once taking the match/mismatch between the individual's preferred and usual working hours into account. In that case, the actual amount of working hours is irrelevant, as SWB is only dependent on the degree of fit between actual and desired working hours. On the basis of the theory of personal-environment fit, we formulate the following hypothesis:

## **Hypothesis 4**

*A mismatch between usual working hours and preferred working hours is associated with lower levels of subjective well-being, compared to a match.*

Whereas the first three hypotheses are based on that the actual amount of usual working hours matter for SWB, the last hypothesis take the contradictory approach of that it is only the degree of fit between preferred and usual working hours that matters for SWB. Thus, the first three hypotheses are more connected to research question 1, while the last hypothesis is more connected to research question 2.



## 5. Literature Review

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*The subsequent section aims to provide insights into some of the vast literature that is available on the associations between subjective well-being and working time. Overall, we see a clear distinction in the literature, where some authors examine the relationship between subjective well-being and working time (similarly to research question 1), while others investigate the relationship between SWB and the concept of working time mismatch (similarly to research question 2). As previously brought up in the delimitations in Chapter 1.4, working time mismatch is commonly defined for individuals whom experience that their actual working hours deviate from their desired working hours. Individuals whom wish to work more hours than their current hours are accordingly classified as underemployed, whereas individuals whom desire to work less hours are thus classified as overemployed.*

### 5.1 Definition of The Two Bodies of Literature

The first body of literature typically focuses on establishing whether shorter or longer working hours are either beneficial or detrimental to people's well-being. Specifically, we observe a tendency for this body of literature to investigate whether part-time or full-time is more advantageous for SWB, for men and women respectively. The common element for the second body of literature is that it is further investigated upon the possibility that differences in subjective well-being levels may be better explained by working time mismatch than the actual working hours – a hypothesis which could be underpinned by e.g. the PE fit theory.

Consequently, both bodies of literature are relevant for this study's first research question, while the second body of literature is mainly relevant for the second research question. In the subsequent sections we will present the two bodies of literature separately. There is however no clear boundary between the two literatures, as the only main aspect that differentiates them is whether or not they include the element of working time mismatch.

The reader should keep in mind that our intention is not to provide a complete overview of the existing literature, but rather to give more in-depth insights into the different empirical findings that are prevailing. This includes a discussion on similarities and differences between prior empirical findings, alongside with insights on methodological aspects of these studies that should be kept in mind – as these aspects provide possible explanations as to why the prevailing literature as of today has not reached a consensus. The presented literature will at last be summarized into an overview of the overall empirical

regularities. Lastly, we will present in which ways that our study differs from the previous literature, as well as state similarities.

## **5.2 First Body of Literature: Working Time and Subjective Well-being**

In a study from Germany based on the German Socio-Economic Panel (GSOEP) by Rätzel (2012), the results suggest that there is an inverse U-shaped relation between subjective well-being (measured by life satisfaction) and working hours. More specifically, the study concludes that the highest life satisfaction level for men is reached at 7.7 working hours per day, whereas the equivalent figure for women is only 4.2 hours. It should be emphasized that these estimates are controlled for income and thus represent the utility-maximizing labour supply (where SWB here serve as a proxy for individual utility), independently of income. Assuming a five-day workweek, these findings represent 38.5 and 21 weekly working hours for men and women respectively. Broadly speaking, these results suggest that full-time is optimal for men with respect to life satisfaction, and thus working hours below and above standard full-time employment are associated with negative marginal effects on well-being. For women on the other hand, the evidence supports the claim that part-time employment is optimal for well-being (Rätzel, 2012). A clear advantage of this study is found in its methodological approach, i.e. that the researcher applies high-quality panel data which allows for an ordinary least squares (OLS) fixed effects model (with its advantages mentioned in Chapter 3.5.3).

The finding by Rätzel (2012) of that women seem to have highest well-being levels when working part-time is largely consistent with findings in the Netherlands by Booth and van Ours (2013). By using data from The OSA (Organisatie voor Strategisch Arbeidsmarktonderzoek) Labour Supply Panel, and an internet-based panel collected by CentERdata, Booth and van Ours (2013) analyze the relationship between part-time work and job satisfaction among Dutch women who are partnered. One of the main objectives of the study was to shed light on whether the high percentage of part-time female workers in the Netherlands is a “transitional phase” that eventually will result in a larger proportion of women working full-time. In testing the hypotheses, a fixed effects logit model was applied. The results show that partnered women that are in part-time employment have high levels of job satisfaction and that they are satisfied with current working hours (Booth & van Ours, 2013).

The evidence from the Netherlands is further underpinned by earlier research by Booth and Van Ours (2008, 2009). In both studies, the authors assess the effect of working hours on life satisfaction, job satisfaction and satisfaction with current working hours. By using panel data from the British Household

Panel Survey (hereby BHPS), Booth and van Ours (2008) find evidence that British partnered women *prefer* part-time employment over full-time employment. The results for partnered men however show that satisfaction with working hours is highest if they are in full-time employment (without overtime hours). Another interesting fact is that the authors find no significant association between partnered men's duration of work and life satisfaction, but that life satisfaction levels rather are dependent on whether or not he is in employment (Booth & van Ours, 2008).

Similar findings of women's preferred working hours were also uncovered in Australia, using data from the Household, Income and Labour Dynamics in Australia (hereby HILDA) survey by Booth and Van Ours (2009). The results of the study suggest that women in part-time employment are more satisfied with their working hours than women in full-time employment. Another interesting finding in this study is that partnered Australian women's life satisfaction was negatively associated with full-time employment, and that the detrimental effects were particularly large for women working more than 40 hours per week. With regards to men however, the evidence suggests that men's life satisfaction is highest when they are in full-time employment (Booth & van Ours, 2009). Summarized, the overall findings of Booth and Van Ours (2008, 2009, 2013) provide support to the claim that women prefer part-time employment, whereas men prefer full-time employment. In terms of methodological issues, all of the studies by Booth and Van Ours (2008, 2009, 2013) exploit the panel nature of the data sets by applying fixed effects models to account for time-invariant individual specific factors, which strengthens the overall validity of the findings.

Although some of the above studies suggest that working long hours may be detrimental to SWB, a more recent research conducted by Rudolf (2014) provides evidence of that this is not necessarily the case. By using panel data from the Korean Labor and Income Panel Study (KLIPS), Rudolf (2014) investigated whether there were increases in subjective well-being levels among workers subsequent to a reduction in working hours in relation to the Korean Five-Day Working Reform. Specifically, the reform entailed a reduction in the country's *normal* working hours from 44 to 40 hours a week (see the definition of normal working hours in Chapter 2.3). The reform was first initiated in 2004 and was introduced step-wise over several years. The author considers the years 1998 to 2008, a period in which the average working hours declined by approximately 10 percent. It should be emphasized that although working hours were reduced substantially over this time period, working hours in Korea are still among the highest in OECD (Rudolf, 2014). In contrast to the hypothesized effect (i.e. that such an event would have a positive effect on the workers' well-being), the results showed that the reductions had no impact on neither job satisfaction or life satisfaction. Interestingly, although the reduction had no impact on life

satisfaction, the evidence showed that the workers' satisfaction with their working hours increased. In relation to methodological issues, there are several features in the approach which give strong support to the validity of the study. First of all, the nature of the data enabled the author to control for individual fixed effects. Further, to our knowledge, this study is the first one to have investigated "the effects of exogenous working hours reduction on individual and family happiness" (Rudolf, 2014). By exploiting the natural experimental setting following the reform, the author is thus able to establish the *causal* relationship between working hours and SWB. Overall, the study provides strong evidence of that working long hours may not be as detrimental to people's well-being as theory would predict.

### **5.3 Second Body of Literature: Working Time Mismatch and Subjective Well-being**

In a study conducted in the United States by Friedland and Price (2003), it was investigated upon the associations between working time mismatch as indicated by under/overemployment and subjective well-being (measured by life satisfaction, depressive symptoms, positive self-concept and job satisfaction). The analysis is based on data from the Americans' Changing Lives (ACL). The authors are the first ones to conduct a SWB research on hours-based under/overemployment using panel data. It should be noted that underemployment in this context is composed of four mutually exclusive categories (hours, income, skills and status). We will not go in-depth on the definitions of these subcategories, but rather highlight that *hours-based* underemployment is defined as individuals who are working *less* than 35 hours per week and have a desire to work more hours. *Hours-based* overemployment on the other hand is defined as individuals whom work *more than* 45 hours per week and report a desire to work fewer hours (Friedland & Price, 2003). The measures of working time mismatch are thus binary.

The results by Friedland and Price (2003) show overall little support for the statement that there is an association between SWB and under/overemployment, as only very few of the coefficients are significant. The significant results however show that overemployment is associated with *lower* levels of depressive symptoms (a rather counterintuitive result), and lower levels of job satisfaction. Among those who were underemployed on the other hand, a positive association was found for job satisfaction (Friedland & Price, 2003). Summarized, taking into consideration that only a few significant associations were identified of the many SWB measures, there are few indications that workers who are either under- or overemployed have lower well-being levels compared to workers who have working hours that are

aligned with their preferences. In terms of methodological aspects, it should be highlighted that the panel nature of the data is only partly exploited to account for time-invariant individual specific factors. In order to avoid overestimation of the effects of under/overemployment due to two-way causality, lagged variables of the SWB measures were included. Lastly, only a limited amount of control variables were included in the analysis to account for individual characteristics, which in our opinion give rise to question the overall internal validity of the results.

In a study carried out in Australia by Wilkins (2007) using the 2001 wave of the HILDA survey, it is investigated upon the association between underemployment and life satisfaction. Although the HILDA survey is indeed commonly known as panel data, the research should be regarded as cross-sectional as only one wave of the survey was applied. In his model, Wilkins (2007) makes a distinction between underemployment among those who are part-time workers and those who are full-time workers. The overall evidence suggests that being part-time employed while at the same time having a desire to be full-time employed is significantly negatively associated with life satisfaction – both for men and women (Wilkins, 2007). It should however be noted that the negative effect of underemployment is mitigated as part-time employment in itself was found to be positively associated with life satisfaction, that is, especially for females where the coefficient on the part-time employment variable is statistically significant. Put in other words, the evidence suggest that part-time employment is beneficial for women's subjective well-being, which is in line with the overall empirical findings in the first body of literature. These results are however indeed in contrast to the earlier findings by Friedland and Price (2003) who found very little support of that underemployment matters for people's well-being. Although methodological efforts have been made to ensure validity of the results (e.g. by estimating several models and including a large amount of control variables), a limitation of the study lies in the fact that the research is based on cross-sectional data. Consequently, it is not possible to draw any conclusions on causal linkages, but the research instead sheds light on the associations between underemployment and subjective well-being.

Another study on working time and working time mismatch and their relation with job- and life satisfaction was conducted by Wooden, Warren and Drago (2009), also based on Australian data from the HILDA survey. A strong contribution in contrast to the research by Wilkins (2007) is that the authors look into *two* types of working time mismatch, i.e. under- and overemployment, compared to only underemployment. The authors test two types mismatch measures, i.e. binary and a measure of the scale of the mismatch in hours. The overall results of the study provide support to the claim that there is no significant association between subjective well-being and the actual working hours (working time),

but rather that it is the aspect of working time match or mismatch that is of importance for people's well-being. When applying binary measures, overemployment is found to have a larger negative effect on job- and life satisfaction than that of underemployment. Once the authors use the absolute difference between actual and preferred working hours however, it is found that underemployment represent a larger problem than initially thought when using binary measures, so that underemployment indeed represents as large negative effect as does overemployment, that is, for job satisfaction. For life satisfaction on the other hand, overemployment still represents a larger negative association than does underemployment, even when using the absolute difference between actual and preferred working hours (Wooden et al., 2009). A clear methodological advantage of the study by Wooden et al. (2009) in comparison to Friedland and Price (2003) and Wilkins (2007) is that the authors fully exploit the panel nature of the HILDA survey. More specifically, they use all the waves that are available from 2001 to 2005, whereas Wilkins (2007) only made use of the first wave. In particular, the panel data constitutes the basis for estimating fixed effects models using least squares methods, which gives support to the overall validity of the study. The main results of the study by Wooden et al. (2009) are indeed consistent with Wilkins (2007) in that it provides evidence of that underemployment is detrimental to SWB. A clear difference in the findings is however that Wilkins (2007) finds that part-time employment is significantly positively associated with SWB for females, whereas Wooden et al. (2009) find no such evidence.

In a study from Germany by Wunder and Heineck (2013) it is investigated upon the relationship between working time preferences, working time mismatch (in hours) and SWB (measured by life satisfaction) among couples. The research is based on panel data from the GSOEP survey and is further restricted to West Germany. Fixed effects are applied to account for time-invariant factors. The overall results of the study suggest that it is not the actual amount of working hours that is of importance for SWB, but that it is the aspect of mismatch that matters. The results for men and women are however somewhat different. For men, underemployment is statistically significant negative associated with SWB, while overemployment on the other hand does not represent any significant detrimental effects on SWB. For women however, *both* under- and overemployment is associated with a significant negative impact on well-being (Wunder & Heineck, 2013). It should be noted that the finding for the male sample that underemployment is more harmful to well-being than that of overemployment is the opposite of the conclusion drawn by Wooden et al. (2009). Working time mismatch in the study by Wunder and Heineck (2013) on the other hand is only measured as the scale of the mismatch in hours, as opposed to a binary measure. In terms of methodological aspects, the same argument as provided above for the research conducted by Wooden et al. (2009) holds for Wunder and Heineck (2013). That is, the panel data is fully

exploited by applying individual fixed effects, which provides stronger validity of the result than study conducted by Wilkins (2007).

In a study from the United Kingdom using panel data from the BHPS, Angrave and Charlwood (2015) partially replicate the research conducted by Wooden et al. (2009). In particular, the authors assess whether long working hours, under- and overemployment are associated with job satisfaction and SWB (measured by life satisfaction and psychological well-being). The analysis is based on the BHPS panel data, enabling the authors to apply individual fixed effects. The overall results suggest that long usual working hours are not significantly associated with SWB, but that working time mismatch is of greater importance. First of all, there is some evidence to support the claim that underemployment is associated with lower levels of SWB. In particular, underemployment among men with working hours in the interval 35 to 40 hours has a significant negative impact on SWB. For women in contrast, significant results of that underemployment is detrimental to SWB were found for those working either 35 hours or less a week *or* more than 50 hours a week. Secondly, there is strong evidence to support the claim that overemployment in general is negatively associated with SWB. Specifically, the results show that being overemployed has a significant detrimental effect on life satisfaction for men, whereas a negative impact on *both* life satisfaction and psychological well-being for women. Overall, the evidence suggests that the *magnitude* of the SWB penalty for men of being underemployed is similar to that of being overemployed. For women in contrast, being overemployed is found to be approximately twice as detrimental to SWB as underemployment, i.e. overemployment seemingly poses a greater threat to women's well-being than underemployment (Angrave & Charlwood, 2015). The reader should however be aware of that only binary measures of working time mismatch have been used in the analysis (as opposed to measuring mismatch by the amount of hours). Broadly speaking, the findings by Angrave and Charlwood (2015) are to a large extent similar to Wooden et al. (2009), i.e. the Australian study they partly replicate. Both studies find evidence that *both* under- and overemployment are significantly negatively associated with SWB. It should however be noted that these results are not completely consistent with the evidence from Germany by Wunder and Heineck (2013), whom concluded that there is no significant SWB penalty among overemployed male workers. Nonetheless, all these three studies conclude that it is the element of working time mismatch that matters for SWB, as opposed to the actual working time.

## 5.4 Derived Empirical Regularities

There is broad consensus in the literature of that the results regarding working time and SWB are different for men and women. Below we have summarized some derived empirical regularities, for the two bodies of literature respectively:

### First body of literature:

- Women have preferences for working part-time, while men have preferences for working full-time.
- Working part-time is associated with higher levels of SWB among women, whereas full-time employment is associated with higher SWB among men.
- There are diverging results on whether long working hours are detrimental to SWB. The study by Rudolf (2014), with strong validity due to methodological aspects that allows for causal inferences, suggested no significant differences in SWB of the longer working hours prior to the working time reduction compared to the shorter hours after the reduction was implemented.

### Second body of literature:

- Once accounting for the aspect of working time mismatch in terms of underemployment or overemployment, overall little evidence is found of a significant association between SWB and working hours concerning actual duration. In other words, the aspect of working time mismatch matters more to SWB than the actual working time. Some evidence however supports the claim that part-time employment has a significant positive association with SWB for women.
- In most studies, both underemployment and overemployment are found to have a significant negative effect on SWB, compared to the reference of being matched.
- Overemployment seems to represent a larger detrimental effect on SWB than that of underemployment.

Overall, we see that the prior literature has not yet reached consensus on the associations between SWB, usual working hours (working time) and usual working hours by match/mismatch (working time mismatch). There are several possible explanations as to why the empirical findings are not necessarily consistent, and we will now elaborate on a selection of these. First of all, differences could be explained by that the studies apply different measures of the response variable (e.g. life satisfaction, job satisfaction, psychological well-being). Another possible explanation could be that the authors take on different approaches to measure cases of mismatch; commonly either by taking the absolute difference



in the amount of hours, or simply using binary measures regardless of the gap between the actual worked hours and preferred hours. Further, the empirical findings may also differ due to differences in the data sets used for the analysis, i.e. whether cross-sectional or panel data has been applied, and whether or not the authors have controlled for individual fixed effects. Lastly, another possible explanation is that the differences in the findings are not due to methodological aspects, but rather reflecting *true differences* between the countries.

## 5.5 How Does this Study Fit into the Literature?

As outlined in the introductory section of this chapter, our study may be seen as a combination of the two bodies of literatures as we investigate on both the associations between subjective well-being and usual working hours, *and* the association between SWB and usual working hours while adding the mismatch element. The most similar studies are however those conducted by Wooden et al. (2009) and Angrave and Charlwood (2015). It should at the same time be emphasized that our study includes hypotheses of that usual working hours are indeed associated with SWB, whereas the studies conducted by Wooden et al. (2009) and Angrave and Charlwood (2015) discard this and instead hypothesize that working time is not of importance, as it is subordinated to working time mismatch. Our study partially replicates Angrave and Charlwood (2015). However, as Angrave and Charlwood (2015) partially replicate Wooden et al. (2009), similarities in our approach may also be found in those laid out by Wooden et al. (2009). On this basis, our *main results* will be compared to those of Angrave and Charlwood (2015), whereas for some of the results from the *complementary analyses* we will make comparisons with Wooden et al. (2009).

Similarities in the approach laid out by Angrave and Charlwood (2015) are first of all found in that we categorize workers into discrete working categories, and that we add the mismatch element using binary measures. Further, we have *also* used the category equivalent to *full-time employment matched* as a reference group in the regression analysis, which has been common conduct in the most prevailing research in this field. Another similarity is found in the question formulations of preferred working hours. Specifically, the BHPS (on which Angrave and Charlwood, 2015 base their analysis) and the ESS (on which we base our analysis) is similar in the way that the respondents are asked to take into account that their chosen number of preferred hours would affect their income. This is also the case for the study by Wooden et al., (2009), whom apply the HILDA survey. A noteworthy difference in our study compared to Angrave and Charlwood (2015) is however found in that the BHPS gives the respondents three

response alternatives of preferred hours in relation to their current hours, i.e. to work more, less, or the same amount of hours (about the same in the HILDA survey). In the ESS on the other hand, the respondents are asked to state their *exact* amount of preferred hours.

Overall, compared to both Angrave and Charlwood (2015) and the second body of literature there are some distinct differences in our approach. First of all, for our *main analysis* we have not made a distinction between under- and overemployment, but have rather categorized all those who would according to common definition be under/overemployed into a single variable labelled “mismatched” – as sample size constraints hinders such a distinction in this study. Thus, our binary measure of mismatch captures both those who are under- and overemployed in one variable. For our *complementary analysis* however, we have addressed the dimensions of under/overemployment using a measure of the scale of the mismatch. This approach is similar to that of Wooden et al. (2009) in that they also include a measure of the scale of mismatch in their complementary analysis (i.e. in addition to binary measures for their main analysis). Angrave and Charlwood (2015) were however unable to conduct such an analysis, as their variable on preferred working hours from the BHPS did not provide any information on the respondents’ exact amount of preferred hours. Thus, for this complementary analysis, comparisons will also be made with Wooden et al. (2009). At last, our study is different from the majority of the prior research in both the first and second body of literature in that we apply cross-sectional data as a basis for our analysis, and we thus cannot control for fixed effects.

## 6. Data

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*This chapter is meant to familiarize the reader with the data that constitutes the basis for the analyses in this study. Specifically, we provide descriptive statistics for the variables of main interest in this study, namely life satisfaction, happiness, usual working hours and preferred working hours. Lastly, we show descriptive statistics for each country in the (eventually) pooled sample, and explain our motivation for using a pooled sample for Scandinavia.*

### 6.1 Description of the European Social Survey Data Set

For the purpose of this study, data has been obtained from the European Social Survey (ESS), which is an academically driven cross-national survey that has been conducted every two years across Europe since 2001 (ESS-ERIC, 2016). The original data set contains 28 countries, out of which Denmark, Norway and Sweden are included in this study. Data has been collected via face-to-face interviews and the samples are representative for all individuals of age 15 and above.

One of the main aims of ESS is to spread higher standards of rigor in cross-sectional research in the social sciences, including for example questionnaire design and pre-testing, sampling, data collection, reduction of bias and high reliability of questions (ESS-ERIC, 2016). This has resulted in that ESS was the winner of the EU Descartes Prize in 2005 for radical innovations in cross-national surveys, and further awarded European Infrastructure Consortium (ERIC) status in 2013 (European Commission, 2005; The European Union, 2013). Because of the high survey quality and credibility, the ESS data has recurrently been used for prior happiness economics research in peer-reviewed academic journals<sup>8</sup>.

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<sup>8</sup> For reference on prior research conducted for ESS data, see for example Van der Meer (2012), Van Der Meer and Wielers (2013), Piper (2015), Firat and Boyer (2015), and Deeming and Jones (2015).

## 6.2 Descriptive Statistics of Variables of Main interest

### 6.2.1 Subjective Well-being: Life Satisfaction and Happiness

#### Life Satisfaction

Life satisfaction is measured through the ESS survey question “All things considered, how satisfied are you with your life as a whole nowadays?”. Responses are on a 0 to 10 scale (11-point) where 0 represents “extremely dissatisfied” and 10 represents “extremely satisfied”. Table 4 shows the distribution of responses to the life satisfaction question, for men and women respectively.

**Table 4.** *The distribution of subjective life satisfaction scores in the European Social Survey, 2010.*

Life satisfaction	Men		Women	
	Count	%	Count	%
0	2	0.15	2	0.17
1	2	0.15	1	0.09
2	5	0.38	1	0.09
3	10	0.75	3	0.26
4	14	1.05	9	0.78
5	45	3.39	51	4.41
6	59	4.44	55	4.76
7	178	13.39	157	13.58
8	473	35.59	365	31.57
9	350	26.34	339	29.33
10	191	14.37	173	14.97
<b>Total</b>	<b>1329</b>	<b>100</b>	<b>1156</b>	<b>100</b>
<b>Mean</b>	<b>8.07</b>		<b>8.09</b>	
<b>SD</b>	<b>0.85</b>		<b>0.84</b>	

*Note:* All figures are weighted population estimates.

Overall, we observe that the upper scale of life satisfaction is much more frequently used than the lower scale. Both for men and women, the majority of the respondents report life satisfaction levels of 8 and 9. We may further observe that the mean of life satisfaction scores for men is 8.07, slightly below the equivalent figure for women of 8.09.

## Happy

Happiness is measured through the ESS survey question “Taking all things together, how happy would you say you are?”. Responses are on the same 0 to 10 (11-point) scale as for life satisfaction, i.e. 0 represents “extremely unhappy” and 10 represents “extremely happy”. Table 5 shows the distribution of responses to the question on happiness, for men and women respectively.

**Table 5.** *The distribution of subjective happiness scores in in the European Social Survey, 2010.*

Happy	Men		Women	
	Count	%	Count	%
0	1	0.08	1	0.09
1	1	0.08	0	0
2	2	0.15	4	0.35
3	8	0.60	2	0.17
4	15	1.13	4	0.35
5	34	2.56	41	3.54
6	54	4.07	45	3.89
7	228	17.17	173	14.95
8	477	35.92	393	33.97
9	346	26.05	322	27.83
10	162	12.20	172	14.87
<b>Total</b>	<b>1328</b>	<b>100</b>	<b>1157</b>	<b>100</b>
<b>Mean</b>	<b>8.06</b>		<b>8.12</b>	
<b>SD</b>	<b>0.79</b>		<b>0.78</b>	

*Note:* All figures are weighted population estimates.

Overall, we observe the same tendencies as for the distribution of life satisfaction. Also for happiness, the majority of the respondents report SWB levels of 8 and 9, and mean happiness is slightly lower for men than for women – the figures being 8.06 and 8.12 respectively. For both SWB measures, approximately 90 percent of the respondents use the four highest points of the scale.

## 6.2.2 Working hours

### Usual Working Hours

Usual working hours are measured by the ESS survey question “Regardless of your basic or contracted hours, how many hours do/did you normally work a week (in your main job), including any paid or unpaid overtime?”. This aligns well by the previous definition of *usual working hours* outlined in Chapter 2.3. The answers of this question are reported as continuous numbers, which has been the basis for grouping the respondents into five categories of usual working hours; <27, 27-32, 33-36, 37-42 and 43+.

In this thesis, the working time category 37-42 hours will serve as a proxy for full-time employment (further, as it includes the average of usual working hours among full-time employees in Scandinavia, it will often be referred to as “standard full-time employment”), and the working time categories of 36 hours and below accordingly serve as a proxy for part-time employment. Lastly, the highest working time category of 43+ hours serves as a proxy for long working hours. In the chapter on The Scandinavian Labour market, it was mentioned that a common definition for long working hours is 50 hours and above, which thus is different from our definition. The reason for using another definition here is that there were few individuals working 50 hours and above in our sample. This reflects the fact that long working hours (by common definition) are far less common in Scandinavia compared to the rest of Europe (as shown in Table 2, Chapter 2).

In the decision of choosing the appropriate categories of working hours, other aspects have also been kept in mind – specifically the case experiments with working time reductions that were brought up in the introductory chapter. Trials with working time reductions from 40-hours to 30-hours workweek (or eight-hours to six-hours work day) have been widely debated. Since there is a high interest in the potential differences in subjective well-being levels between these specific working hours, the intervals of the working time categories in this study have been composed in such a way that one of the categories captures the individuals working in an interval around 40 hours weekly (37-42 hours), and another of the categories includes people working in an interval around 30 hours weekly (27-32 hours). Hence, it is possible for the interested reader to compare potential differences between an approximate 30-hours respectively 40-hours workweek.

**Table 6.** *The distribution of usual working hours in the European Social Survey, 2010.*

Usual working hours	Men		Women	
	%	Cumulative %	%	Cumulative %
<27	4.08	4.08	11.73	11.73
27-32	3.40	7.48	15.20	26.93
33-36	4.15	11.63	9.99	36.92
37-42	49.06	60.69	46.13	83.05
43+	39.32	100	16.94	100
<b>Sub-total</b>	<b>100</b>		<b>100</b>	

*Note:* All figures are weighted population estimates.

Table 6 shows the distribution of usual working hours among men and women. Overall, we observe that the highest proportion report being in full-time employment, with almost half of the sample in this category for both men and women. There is however much more spread in the distribution of usual working hours among women than that of men. This can clearly be seen through the cumulative percentages, displaying that almost 37 percent of the female sample are in part-time employment, whereas the equivalent figure for men is approximately 12 percent.

### **Preferred working hours and usual working hours – the basis for working time match/mismatch**

The ESS Round 5 includes a question where respondents are asked “How many hours a week, if any, would you choose to work, bearing in mind that your earnings would go up or down according to how many hours you work?” This question thus provides a measure of the respondents’ *preferred* usual working hours, taking the income aspect into account. The categorization of match and mismatch was done by combining the information obtained by the ESS questions of usual working hours and preferred working hours. In this thesis, a mismatch is defined as an absolute difference between usual and preferred working hours of 5 hours or more. Consequently, match is defined as an absolute difference between usual and preferred hours of 4 hours or less. Upon the inclusion of the mismatch element for research question 2, sample size restrictions for men in the lower working time intervals led to that different working time categories have been used for men and women. These categories reflect the fact that part-time employment is more common among women (as seen in the distribution of usual working hours in Table 6 above).

**Table 7.** Distributions of usual working hours by match/mismatch in the European Social Survey, 2010.

Usual working hours	Matched	Mismatched	Distribution
	%	%	%
<b>Men</b>			
<37	50.00	50.00	11.59
37-42	70.47	29.53	49.46
43+	24.60	75.40	38.95
<b>Sub-total</b>	<b>50.23</b>	<b>49.77</b>	<b>100</b>
<b>Women</b>			
<27	50.00	50.00	11.80
27-32	69.71	30.29	15.40
33-36	68.75	31.25	9.86
37-42	61.41	38.59	46.30
43+	15.34	84.66	16.64
<b>Sub-total</b>	<b>54.40</b>	<b>45.60</b>	<b>100</b>

Note: All figures are weighted population estimates.

Table 7 shows the distribution of usual working hours by working time match and mismatch respectively in the sample. Overall, it should first be noted that the sub-totals suggest that approximately *half* of the sample experience that their actual working hours are not aligned with preferred hours, both among men and women. Further, an interesting observation is that the highest proportion of matched cases among the male sample is found in the full-time employment category (37-42), whereas the highest proportions of matched cases in the female sample are found in part-time employment categories (27-32 and 33-36). Lastly, we observe that the category of long working hours (43+) represents the highest percentage of mismatch, both for the male and female sample. Put in other words, the probability of being mismatched is the highest when usual working hours exceed standard full-time employment.



## 6.3 The Scandinavian Countries as a Pooled Sample

### 6.3.1 Descriptive Statistics of the Individual Countries in the Pooled Sample

**Table 8.** Variable means and standard deviations for life satisfaction, happiness, usual working hours and preferred working hours for Denmark, Norway and Sweden, in the European Social Survey, 2010.

Country	Men			Women		
	DK	NO	SE	DK	NO	SE
<b>Life satisfaction</b>						
Mean	8.41	7.85	8.00	8.36	8.10	7.96
SD	0.70	0.76	1.05	0.71	0.68	1.06
<b>Happy</b>						
Mean	8.29	7.95	7.99	8.39	8.15	7.97
SD	0.67	0.67	0.99	0.65	0.66	0.95
<b>Usual working hours</b>						
Mean	42.37	41.80	42.43	35.24	35.94	37.55
SD	5.19	4.03	7.78	4.80	4.62	6.22
<b>Preferred usual working hours</b>						
Mean	36.76	38.72	37.17	30.52	33.88	34.33
SD	5.08	3.57	6.24	5.18	3.90	5.43

Note: All figures are weighted population estimates.

Table 8 indicates that the Danish respondents clearly stand out with the highest subjective well-being mean levels, both for men and women. It should further be noted that the lowest SWB mean levels are found in the Norwegian male sample and the Swedish female sample respectively. With regards to *usual working hours* in Scandinavia, we observe that Swedes (both in the male and female sample) represent the highest mean levels of usual working hours. The lowest figure in the male sample is found among the Norwegian respondents, whereas the equivalent figure for the female sample is found among the Danish respondents. An interesting overall observation regarding *preferred usual working hours* is that the mean levels for each country (both for the male and female sample) are *below* the mean levels of usual working hours. This implies that *on average*, the respondents in the Scandinavian countries have preferences for working less hours than they currently work. It can further be observed that the highest mean level of preferred usual working hours for men is found among Norwegian respondents, whereas the equivalent figure for women is found among Swedes. Lastly, the Danes stand out in that both the male and female sample represent the lowest mean of preferred working hours.

### **6.3.2 Motivation for Using a Pooled Sample for Scandinavia**

Although the above analysis shows that there are some differences in country averages with regards to the SWB measures, usual working hours and preferred working hours, the Scandinavian countries still have many similarities compared to other countries. In the chapter on The Scandinavian Labour Market, we saw evidence of that Denmark, Norway and Sweden share many common patterns with regards to working hours, and that they are relatively uniform compared to the rest of Europe. Furthermore, the Scandinavian countries are similar when it comes to many aspects that have a proven explanatory effect on well-being. These include the environment and personal and political freedom, as well as many of the economic determinants of well-being; unemployment rates, the inflation rate and income equality (Weimann, Knabe, & Schöb, 2015). These aspects are the motivation as to why we believe that the sample still is relatively homogenous when combining the samples from Denmark, Norway and Sweden.

The motivation of striving for a relatively homogenous sample is the reason to why we have renounced the possibility of a larger sample size by including more countries from the ESS data set. If for example all countries in the ESS data set would have been included in the study, there would have been a risk of reduced internal validity due to omitted explanatory variables related to country-specific aspects. Conducting research for a relatively homogenous population also has the advantage of the avoidance of biases caused by cultural differences in response styles. Van Herk, Poortinga, and Verhallen (2004) showed systematic differences in response styles for Mediterranean countries (Greece, Italy and Spain) compared to north-western Europe (Germany, France and the United Kingdom). It has proven to be challenging to separate out valid differences on a variable from the presence or absence of response styles in cross-cultural studies, which can be especially problematic for cross-sectional data (Hamamura, Heine, & Paulhus, 2008). Furthermore, according to the theory of the social production function (presented in Chapter 4), people tend to judge their SWB by comparing their situation with a reference standard or norm, derived from their prior and ongoing social experience. Thus, assuming that the respondents' usual working hours in relation to the society's norm could have an impact when people evaluate their life situation, it is beneficial that the working hours are relatively similar in the Scandinavian countries. Finally, combining the three Scandinavian countries has the advantage of a larger sample size compared to the alternative to study one country in isolation.

## 7. Methods and Techniques

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*In the subsequent sections we will provide in-depth insights into the methodological approach of this study, specifically; the methods and techniques applied. First, we will explain the motivation for using data from the fifth round of ESS. Subsequently, we present the empirical model we apply for estimating the associations between working time and subjective well-being for each of the two research questions. Afterwards, we will provide insights into the selection procedure applied in choosing covariates in the final model specification, and outline the steps we have taken in relation to data preparation of the original ESS data set before conducting the analysis. The latter part of this section entails how we have restricted the initial sample and variable treatment of the ESS variables (with the objective of facilitating for future replication of the study). Additionally, we will outline which signs we expect for each of the coefficients, which is based on prior literature (i.e. mainly literature reviews). Lastly, we will outline the econometric procedure and thereby the econometric tests performed to further check whether the Gauss-Markov assumptions are met.*

### 7.1 Choice of Survey Round

For the purpose of this study, we have made use of the European Social Survey Round 5 from 2010 that focuses on family, work and well-being. Despite the limitations of cross-sectional data, we are of the belief of that the ESS is the best data set freely available for the purpose of this study (the credibility of ESS was explained in the preceding chapter on Data). The ESS Round 5 contains the crucial dependent and explanatory variables, as well as necessary control variables. The second research question addressing working time mismatch requires information on individual preferred working hours, which was only available for this round. Furthermore, some specific work-related questions, such as work satisfaction, were only included in Round 5, which serves as important control variables. Since work-related variables potentially are associated with working time, the omission of such controls could cause severe omitted variable bias of the explanatory variable of interest (see Chapter 3.5.3 for the explanation of Omitted Variable Bias).

The natural implication of only using one ESS round is less observations in the sample, compared to if data from several or all rounds would have been used. It should also be noted that the use of this single round consequently means that the study is based on the ESS survey answers from the single year 2010, as opposed to surveys from different years. In our opinion, there are however no extraordinary events in Scandinavia this specific year, such as dramatic changes in the economic environment or

terror attacks, which make 2010 a seemingly representative year. Additionally, results in SWB research tend to be the same over different time periods (Oswald, 1997).

## 7.2 Empirical Model

The associations between subjective well-being and working time were examined by using model 1 and 2 for the research questions 1 and 2 respectively:

$$(1) Y_i = \alpha + \beta D_{1i} + \gamma Z_i + \varepsilon_i$$

*more specifically;*

$$SWB_i = \alpha + \beta \text{working hours}_i + \gamma \text{controls}_i + \varepsilon_i$$

$$(2) Y_i = \alpha + \beta (D_{1i} * D_{2i}) + \gamma Z_i + \varepsilon_i$$

*more specifically;*

$$SWB_i = \alpha + \beta (\text{working hours}_i * \text{mismatched}_i) + \gamma \text{controls}_i + \varepsilon_i$$

In both models,  $SWB_i$  represents subjective well-being for individual  $i$ , measured as overall life satisfaction in the first specification and overall happiness in the second specification. The intercept is denoted  $\alpha$ ,  $\text{working hours}_i$  is the dummy variable for the different working time categories (taking on the value 1 if individual  $i$ 's usual working hours falls into the given working time category, and 0 otherwise).  $\text{Controls}_i$  captures other measured covariates that might influence subjective well-being and  $\varepsilon_i$  is the error term.

In the second model,  $\text{mismatched}_i$  is the dummy variable representing the presence of mismatch between usual working hours and preferred hours, taking on the value 1 if mismatched and 0 otherwise (further definition will follow below).  $\text{Working hours}_i * \text{mismatched}_i$  is the interaction between usual working hours and the presence of working time mismatch.

We followed the cardinality assumption because of its practical advantage (see Chapter 3.5.1 for reference on the ordinality versus cardinality assumptions). In accordance with this, OLS was used for estimating the empirical model, which also has been common in the previous literature (e.g. Angrave & Charlwood, 2015; Wilkins, 2007; Wooden et al., 2009). List-wise deletion was applied for missing values.

As previously mentioned, we have defined a match as an absolute difference between usual and preferred hours in the interval of 0 to 4 hours, while a mismatch represents an absolute difference of 5 hours or more. The decision to define match as an interval around the exact match (where the usual working hours equal preferred hours) was based on one of Caplan's (1987) suggested modifications to the U-shaped curves that minimize at personal-environment fit. It was suggested that well-being only starts to decrease beyond the boundaries of an interval of tolerance surrounding the exact match (described in the person-environment fit theory in Chapter 4). In current study, since the match or mismatch is indicated by dummy variables as opposed to the absolute hours of mismatch, we believe that it is reasonable to apply a tolerance interval to examine research question 2.

### **7.3 Selection Procedure of Covariates in the Final Model Specification**

The properties of the regression estimates of the coefficients depend crucially on the validity of the model specification (Dougherty, 2011, pp. 250-258). The problems caused by the omission of variables that ought to be included in the model has previously been described (see "Omitted Variable Bias" in Chapter 3.5.3), with the general implication of biased estimates and invalid standard errors. But it is neither good to include variables that ought not to be included. Even though it does not result in biased estimates, the coefficients will in general be inefficient, which in turn can cause needlessly large standard errors (Dougherty, 2011, pp. 250-258).

As the validity of this study depends largely on the validity of the model specification, particular care has been taken in specifying the model as accurate as possible within the boundaries of the data set. The set of potential covariates has been determined by combining the knowledge from some of the most extensive works in happiness research. This includes, but is not limited to, Dolan, Peasgood, and White's (2007) review of the economic literature on the factors associated with SWB, Frey and Stutzer's (2001) book with focus on the determinants of SWB and the book "Measuring Happiness" by Weimann et al. (2015). There is consensus about many of the determinants in the three works, and most of them are also commonly included as covariates in reliable SWB research. Some of the potential determinants mentioned in Dolan et al.'s (2007) work have however proven to be ambiguously related with SWB, dependent on the other included control variables. The expected signs of the specific variables in our model, presented in the subsequent section on the variable treatment, will also be based on derived regularities from the prior literature.

For determining the final set of covariates in this study, many different sub-regressions have been tested. The procedure of arriving to the final specification started with defining a base set of control variables that always should be included according to the literature (e.g. age, health, income, living with a partner). Thereafter, other possible determinants have been added to the regression step-wise. For example, first the work-related variables have been added in one step, while variables related to trust and religion have been added in a later step. The assessment of whether to keep the variables as controls have then been determined partly by assessing whether the group of variables in a certain category significantly improves the goodness of fit, and partly by assessing whether the coefficient signs make sense in relation to what is expected in the literature. The most “questionable” variables have been added step-wise one by one in the last step of the regression, to assess whether these should be included or not. To save space, only the final regression resulting from these step-wise introductions of new variables will be presented in the thesis.

With regards to the five types of key determinants of happiness (listed in Chapter 3.4), it has not been possible to include any direct control variables for personality factors due to the limitations of the data set. Neither has there been any opportunity to use fixed effects for these time-invariant personality traits because of the cross-sectional nature of the ESS data. We have however included other variables that previously have proven to be strongly influenced by personality, with the intention of that these potentially could capture some part of the respondents’ personality traits. Furthermore, we have aimed to include suitable control variables for the other four types of key determinants of SWB. Dummy variables indicating the respondents’ country of residence are used to capture the combined effect of country differences for economic factors such as the unemployment rate and inflation, and institutional factors such as the extent of political decentralization.

## **7.4 Data Preparation**

### **7.4.1 Restricting the Initial Sample**

The original data set of ESS Round 5 consisted of observations from 28 European countries. The first step in the data preparation was to restrict the sample to respondents from Denmark, Norway and Sweden (indicated by the variable “cntry”). As the population of interest in this study is the working population, here defined as working-age individuals between 18 and 65 in paid work, the initial sample was restricted accordingly. Upon limiting the data set to respondents from Scandinavia, 4620

observations remained. The equivalent figure after restricting the sample to the working population was 2488, with the process outlined below.

Our approach to restrict the sample to the working population was to first make use of a variable that indicates whether the respondent is in paid work. As the respondent can indicate several activities, we have from then onwards used other variables to identify respondents that should be excluded despite that they have indicated paid work as one of their activities. In the first step, we made use of the binary variable “Doing last 7 days: paid work”. Paid work implies employees, those away temporarily, self-employed and those working for a family business. All respondents who have indicated that they are not in paid work were deleted in the first step (0 at “pdwrk”). Further, we excluded the respondents that alongside with paid work also for some reason had indicated retired or unemployed as one of their activities for the last seven days (1 at either “rtrd”, “uempl” or “uempli”). As a further check, we excluded respondents who have reported “not applicable” as the answer to the variable indicating the amount of usual working hours (“wkhtot”). The reason for this is that the wording of the question asks respondents to report usual working hours that they “do/did” have in their main job. Accordingly, we assume that choosing the non-applicable alternative suggest that the respondent has never been in employment. Finally, we have used the variable that indicates the respondents’ age to exclude those outside the interval 18 to 65 years (indicated by “agea”).

Upon arriving to the pooled Scandinavian data set with only the working population, the sample was split according to gender (indicated by the variable “gndr”). This resulted in a male sample containing 1329 observations and a female sample containing 1159 observations.

The alternative to not restricting the sample to the working population, i.e. also including the unemployed, would have resulted in a substantially higher amount of missing values due to non-applicable responses for e.g. working time and work satisfaction. Because of the complications with missing values in econometric research, our approach has been to avoid missings to the largest possible extent.

#### **7.4.2 Variable Treatment**

Regarding the included variables in the regression model, some have been used directly as they were in the original ESS data set, while many also have been modified in different ways. A full list of all variables and the potential adjustments to those may be found in Appendix A. Thus, the following description of the data preparation of the variables will be non-exhaustive. In the choice of the specific ESS variables, we have aimed to avoid variables with many missing values whenever it has been

possible. For example, when there have been several variables available that can be used to approximate the same determinant of subjective well-being, we have chosen the ones with a lower amount of missing values. We have also avoided to use questions that do not apply to the full sample, e.g. the employment status of the partner (as that would create many non-applicable answers for the respondents without a partner). The variable treatment procedure outlined below is complemented with expected signs of the coefficients for the different variables, based on derived regularities in the previous SWB literature<sup>9</sup>.

### **Dependent variables and covariates of interest**

For the two dependent SWB measures life satisfaction and happiness, the original variables provided in the data set with the 11-point scale could be used directly. Regarding the explanatory variables of interest, i.e. the working hours variables, modifications have been made. As previously described in the Empirical Model (Chapter 7.2), these were categorized into discrete groups. By using the continuous variable of usual working hours, we categorized the respondents into dummy variables; <27 hours, 27-32 hours, 33-36 hours, 37-42 hours and 43+ hours. Categorization of working hours is a commonly used approach to detect possible nonlinearities in the association between SWB and working hours (see e.g. Angrave & Charlwood, 2015). For the regressions including the working time mismatch element, we made use of the two continuous variables for usual working hours and preferred working hours. Firstly, the respondents were categorized into groups according to the usual working hours (the same categories as mentioned above for women, and the categories <37 hours, 37-42 hours and 43+ hours for men). Thereafter, a dummy variable was created that indicated match or mismatch, according to the definition in the Empirical Model. Lastly, the dummy variables for working time mismatch were created by interacting the categories of usual working hours with the dummy variable indicating match or mismatch.

### **Socio-demographic variables**

The literature suggests a U-shaped (non-linear) relationship between age and subjective well-being, minimizing in middle-age between 32 and 50 years, depending on the study, and maximizing at the younger and older age points. To account for the non-linearity, we created four dummy variables from the original continuous age variable for the age categories <25, 25-34, 35-49 and 50+. Since our data set only contains respondents up to 65 years, and thus the oldest part of the population is excluded, the

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<sup>9</sup> The regularities have been derived from combining the knowledge from a range of different works on subjective well-being, which include Dolan et al. (2007), Frey and Stutzer (2001) and Weimann et al. (2015).



expected coefficient sign for the category 50+ is ambiguous. We do however expect a positive relation for the category <25, and a negative relation for the categories 25-34 and 35-49.

There is complete consensus in the literature of that good health is positively associated with SWB. Since the original ESS variable on a 1-5 scale indicated 1 as the best health condition (subjectively measured by the respondent), we reversed the scale for a more straight-forward interpretation of the estimated coefficients.

Regarding civil status, we decided to use the dummy variable indicating whether the respondent lives with a partner or not instead of using marital status. If the variable marital status would have been used, both singles and unmarried people living with a partner would have fallen into the same category. Thus, we are of the belief that 'living with a partner' serves as a better variable for the respondents' civil status, with an expected positive coefficient. Having children has shown to be ambiguously related with SWB, but yet it is very common to include a variable for this. We have used the available dummy variable indicating whether the respondent has children living at home or not.

Ethnicity has previously shown to matter for SWB. If too many ethnicity categories would have been used, there would be very few respondents in many of the categories, which would have reduced the ability to make statistical inferences. Hence, we chose to use a dummy indicating whether the respondent belongs to a minority ethnic group or not. We expect a negative sign of the estimated coefficient.

The ESS data contains a variable indicating different levels of the respondents' highest educational attainment on a 1-7 scale. From this variable, we created four dummy variables according to the same categories as used by Wilkins (2007). These are 'not completed high school' (lowest educational level), 'completed high school', 'other post-school qualification' than 'degree', and 'degree' indicating bachelor or master degree (highest educational level). Some studies have suggested that the educational attainment level is positively related with SWB due to status effects, while other studies have shown a negative relation of having a degree (bachelor or master).

From a variable indicating three different degrees of urbanisation of the respondents' geographical area of residence, we created one dummy variable for living in a 'big city', as the literature suggests a negative relation with SWB.

### **Economic and institutional factors**

We created three dummy variables indicating the respondents' country of residence, with the aim of these to capture all associations that are related to country differences - both concerning economic and institutional factors.

It is well-documented that subjective income is more important for SWB than absolute income, as reference groups play an important role for income aspirations (described in the Theoretical Framework in Chapter 4). We have used the 1 to 4 scale for the respondents' feelings about their household income, with an expected positive relation with SWB. We reversed the original scale for a more straight-forward interpretation, with 4 representing the highest level of the scale.

As a measure of absolute income, from one variable with a 1 to 10 scale indicating in which decile the respondents' total household income falls into, we created dummy variables for each income decile (where decile 1 corresponds to a household income held by 10 percent of households with the lowest income, while decile 10 represents a household income held by 10 percent of households with the highest income). The advantage of using deciles is that it compares the household income in relation to the population in the given country, which is beneficial as 1 euro has different purchasing power in different countries. A main disadvantage is however that it does not account for the number of household members. It is common to weight the household income with a certain formula that accounts for the number of household members, but this was however not possible for this data set as there were no continuous variable for the household income. Missing values due to non-response are commonly non-random for income variables specifically, which also seemed to be the case for our data set concerning the higher proportion of missing values for household income compared to other variables. As non-random missing values mean that list-wise deletion can yield biased estimates (Newman, 2014), we instead added a dummy variable for "missing income" to avoid non-random missing values for income.

### **Contextual and Situational Factors**

As a proxy for interpersonal relations, we used a variable indicating social activity compared to age. This seemed more relevant than an alternative ESS variable indicating the weekly amount of social interactions per se, to allow for the respondents' subjective view of their situation. We used the original 1 to 5 scale and expect a positive relation with SWB.

The inclusion of work-related variables was crucial to this study. If for example no other variables related to work would have been included except for the working hours variables, there would have been a substantial risk for omitted variables bias. Work-related variables that were available specifically in ESS'

fifth round was e.g. the variable on subjective job satisfaction, measured on a 0 to 10 scale. We used this variable as a proxy for various work-related aspects that are commonly associated with SWB, such as autonomy and flexibility. We expect a positive relation between job satisfaction and SWB. From a variable that indicated the type of employment contract on a 1 to 3 scale, we created a combined dummy variable for no contract or limited contract, with the reference of having a contract. A negative coefficient sign is expected for this dummy. As the literature suggests a positive relation between self-employment and SWB, we created a dummy for self-employment from an original variable indicating the type of employment. Furthermore, since evidence suggests that previous unemployment might have a persistent negative effect on SWB, we have included the dummy variable for 'any employment or work seeking during the last 5 years'. It should however be noted that previous unemployment has a much more negative effect in societies with a bad security net, while previous unemployment might not always be negatively associated with SWB in countries with a well-working welfare system such as in Scandinavia.

Since the type of occupation can be expected to correlate with both working hours and SWB (implying a risk of omitted variable bias if excluded), we included different dummy variables according to occupational category. We made use of a variable in the ESS data set indicating different codes for all possible occupations. We divided these into nine dummy variables by using the International Standard Classification of Occupations (ISCO-88)<sup>10</sup>.

### **Other variables**

As there were no variables available in the ESS data set that specifically can be used to control for personality, we have used other variables that might capture some personality differences. Unmeasured personality differences are likely to influence trust, frequency of contacts and life satisfaction, all in the same direction (Helliwell, 2006). When it comes to trust, specific and general trust have been shown to have substantial effects on well-being. As a measure of social trust, we have used a variable that indicates the respondents' trust in other people on a 0 to 10 scale, for which we expect a positive relation with both SWB measures. To measure trust in key institutions, we took the average of three variables that were all on 0 to 10 scales; trust in legal system, trust in country's parliament and trust in the police. Based on Dolan et al. (2007), we expect a positive relation with life satisfaction.

As evidence has suggested a positive relation between religious beliefs and life satisfaction, we included a variable indicating how religious the respondent is on a 0 to 10 scale. We expect a positive coefficient

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<sup>10</sup> The 10th occupational category in ISCO-88 for "armed forces" was excluded as there were no respondents in this category.

sign, but it is less certain whether the variable will be statistically significant, as evidence has suggested stronger effects in the US compared to Europe (Dolan et al., 2007).

## 7.5 Econometric Procedure

While the focus in the preceding sections has been on the model specification, a correctly specified model represents only one of the assumptions that needs to be fulfilled in order for the OLS coefficients to be BLUE (Best Linear Unbiased Estimator). After the final model had been specified, we performed a range of econometric tests with regards to the compliance of the Gauss-Markov assumptions as well as other potential econometric issues. The overall econometric procedure is described below.

Since OLS is applicable to capture a linear relation between the dependent variable and its regressors, linearity between these is assumed (Dougherty, 2011, pp. 112-114). The literature has suggested a non-linear relation between SWB and some of the included covariates, namely usual working hours, education, age and household income<sup>11</sup>. The non-linear relationships were accounted for by decomposing the original variables into a set of dummy variables.

According to the Gauss-Markov assumptions, the disturbance term needs to be homoscedastic (Dougherty, 2011, pp. 112-114). In general, however, economic theory rarely gives any reason to believe that the errors are homoscedastic. The practical recommendation is thus to always make use of heteroscedasticity-robust standard errors (Stock & Watson, 2011, p. 203). We have also tested for this by White's test in combination of graphical assessment of the distribution of the residuals in relation to their predicted value. The White's test showed that the assumption of homoscedasticity could be rejected for many of the regressions, but it was however hard to interpret the graphical distribution of the residuals due to the cardinal scale of the dependent variable (as opposed to a continuous variable). On the basis of this, we followed the general recommendation to assume heteroscedastic residuals.

Perfect multicollinearity means that one of the regressors is a perfect linear function of the other regressors (Stock & Watson, 2011, p. 239). As one of the OLS assumptions is that the regressors are not perfectly multicollinear, we have tested for this by checking the variance inflation factors (VIF), which quantifies the severity of multicollinearity, and the tolerance values. As all values were far from the general rule of thumb of for which values that multicollinearity can imply a problem (VIF values above

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<sup>11</sup> Based on derived regularities from the literature in the Literature Review, Chapter 5.

10 and tolerance values below 0.1 (UCLA: Statistical Consulting Group, 2016)), we concluded that there were no issues with multicollinearity in our regressions.

It is further assumed that the disturbance term has a normal distribution (Dougherty, 2011, pp. 112-114). If the disturbance term is normally distributed, so will the regression coefficients be, which is useful for the t-tests and F-tests to be valid. The justification of the assumption depends on the central limit theorem. In the essence, it states that if a random variable is the composite result of the effects of a large number of other random variables, it will have an approximate normal distribution even if the components do not, provided that none of them is dominant (Dougherty, 2011, pp. 112-114). Based on this, it can usually be assumed that the error term is approximately normally distributed. We also examined whether this seemed to hold for our regressions. The formal tests such as Shapiro-Wilk indicated that the assumption of normality in the residuals was rejected, but these tests do however not show how far the distribution of the residuals are from normal. Thus, we complemented the tests by graphical assessment of plots over the distribution of the residuals and plots over the density of the residuals (Kernel Density Estimate). The plots suggested that there were some deviations from normality, but that the residuals in general followed a normal distribution.

An important assumption is that large outliers, i.e. observations with values far outside the usual range of the data, are unlikely (Stock & Watson, 2011, pp. 238-239). The reason for this is that the OLS estimator of the coefficients can be very sensitive to large outliers. With regards to this, we performed graphical assessments of different plots in order to detect potential outliers, including studentized residuals, Cook's D and influence diagnostics. All plots clearly indicated that there were problems with "bad" outliers, defined as being outside the acceptance intervals. The studentized residuals showed that the outlier problems were mainly in the response direction (the Y-variable).

Summarized, the econometric tests and plots indicated that the main issues that can cause OLS to not be BLUE are outliers and heteroscedasticity. On the basis of this, we used a technique for OLS that is supposed to be robust against the influence from these econometric issues. The most common general method of robust regression is M estimation, introduced by Huber in 1973 (Huber, 1973). Although it is not robust against leverage points (outliers in the X-direction), it is extensively used in analyzing data for which it can be assumed that the outliers are mainly in the response direction (Y-variable) (Chen, 2002). As this criterion fits very well for mitigating the potential issues in our regressions, we used M estimation as a robust technique for OLS in all the performed regressions in current study.

## 7.6 The Usage of European Social Survey Weights

In accordance with the recommendations made by the European Social Survey (ESS), we have applied weights for all the regressions in current study (ESS-ERIC, 2014). The ESS Round 5 offers three types of weights; design, post-stratification and population size weights. When combining the samples of different countries to describe a group of countries, which was the case for our regressions with the pooled Scandinavian countries, the ESS guidelines recommend to apply either design weights or post-stratification weights in combination with population size weights. The main purpose of the design weights is “to correct for the fact that in some countries’ respondents have different probabilities to be part of the sample due to the sampling design used” (ESS-ERIC, 2014). In comparison to the design weights, the post-stratification weights are described as “a more sophisticated weighting strategy that uses auxiliary information to reduce the sampling error and potential non-response bias” (ESS-ERIC, 2014). On the basis of this, we chose to apply post-stratification weights in combination with population size weights (that is the product of the ESS variables ‘pswght’ and ‘pweight’).

The fact that we apply population size weights allows the avoidance of a situation where the populations of Denmark and Norway are over-represented at the expense of the larger Swedish population. Specifically, the population size weights ensure that all countries are represented according to the actual size of the population. The implications of applying weights are clearly illustrated in Table 9. By comparing the figures of the *weighted* with the *unweighted* sample, we observe that both Norway and Sweden indeed would be over-represented in an analysis conducted without the application of population size weights.

**Table 9.** *Weighted & unweighted variable means for Denmark, Norway and Sweden, in the European Social Survey, 2010.*

	Men			Women		
	DK	NO	SE	DK	NO	SE
<b>Unweighted sample</b>	0.32	0.38	0.30	0.32	0.34	0.35
<b>Weighted sample</b>	0.26	0.26	0.49	0.26	0.24	0.50

Overall, the application of post-stratification weights in combination with population size weights enables the possibility to reduce sampling error and non-response bias, in addition to reducing the likelihood of any biases in figures due to an over-representation of Denmark and Norway.

## 8. Results

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*In this Chapter we present the results of the analyses conducted in order to answer this study's research questions. First of all, this includes presentation and analysis of the results related to a bivariate analysis of the variables of main interest. These analyses serve as a starting point in investigating the associations between subjective well-being and usual working hours (working time), and usual working hours by working time mismatch (working time mismatch). We have chosen to present figures as opposed to tables for illustrative purposes, facilitating for identification of patterns in mean levels of life satisfaction and happiness along different categories of usual working hours and working time mismatch. Subsequently, we present and analyse the results from the main regression analysis. The main regression analysis is to a large extent based upon the approach laid out by Angrave and Charlwood (2015) and Wooden et al. (2009), as explained in Chapter 5.4 on how this study fits into the literature. After presenting the main results, we present complementary regression analyses conducted for the female population with respect to usual working hours (that is, we exclude the mismatch component related to this study's second research question). The complementary regression analyses are an original contribution of this study, and were conducted with the objective of exploring whether potential common traits connected to different groups of individuals could reveal further insights in the relation between usual working hours and SWB.*

## 8.1 Bivariate Associations

### 8.1.1 Subjective Well-being and Usual Working Hours

**Figure 4.** Weighted mean levels of life satisfaction and happiness by usual working hours in the European Social Survey, 2010, for men and women.



From the bivariate associations shown in Figure 4, different indications on the associations between SWB and usual working hours emerge for men and women. For the male sample we may first of all observe a pattern in that life satisfaction levels are substantially lower for the two lowest working hours categories, that is, for those who work 32 hours and below per week. Concerning happiness however, it is an interesting observation that the standard full-time work category (37-42 hours) clearly stands out in that it represents the lowest mean level of happiness among all working time categories. Overall, the bivariate associations of the male sample suggest that part-time employment below 33 hours is negatively associated with life satisfaction, while working standard full-time is negatively associated with happiness. Lastly, it should be emphasized that the analysis does not provide any indications on whether any particular working hours categories are associated with higher/lower well-being levels for *both* of the SWB measures.

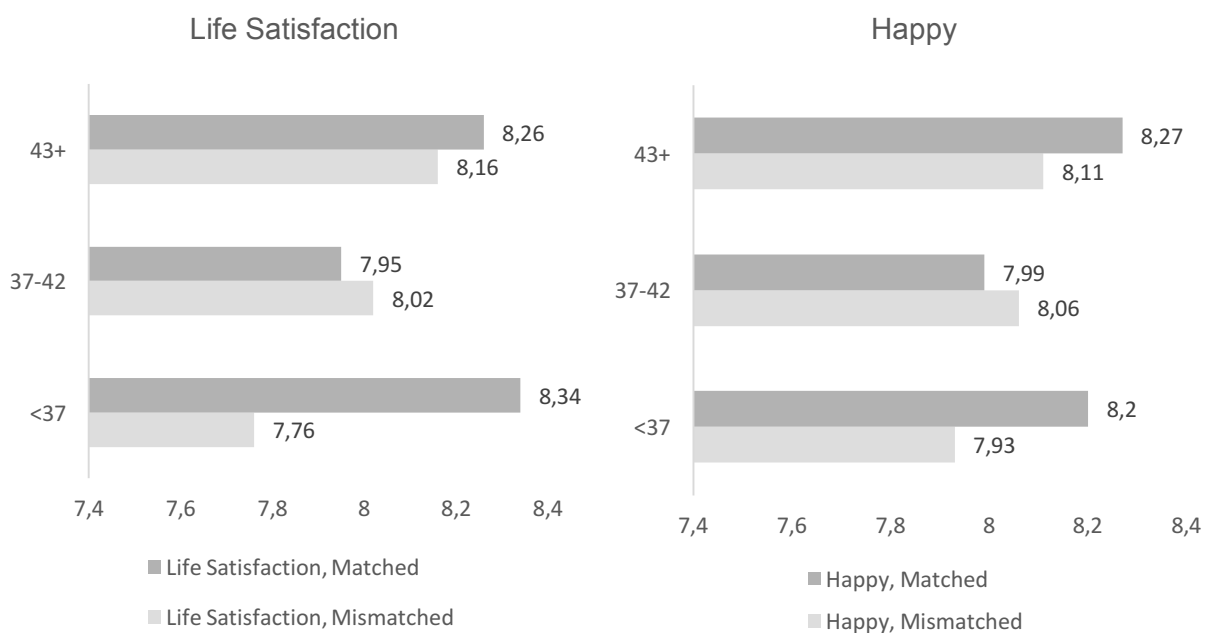


The bivariate associations of the female sample in contrast yield little information of patterns in mean levels of the SWB measures by usual working hours. Interestingly however, we observe that the part-time employment category 27-32 hours represents the substantially highest level of happiness.

## 8.1.2 Subjective Well-being and Usual Working hours by Matched/Mismatched

### 8.1.2.1 Male Sample

**Figure 5.** Weighted mean levels of life satisfaction and happiness by usual working hours and matched/mismatched in the European Social Survey, 2010, for men.



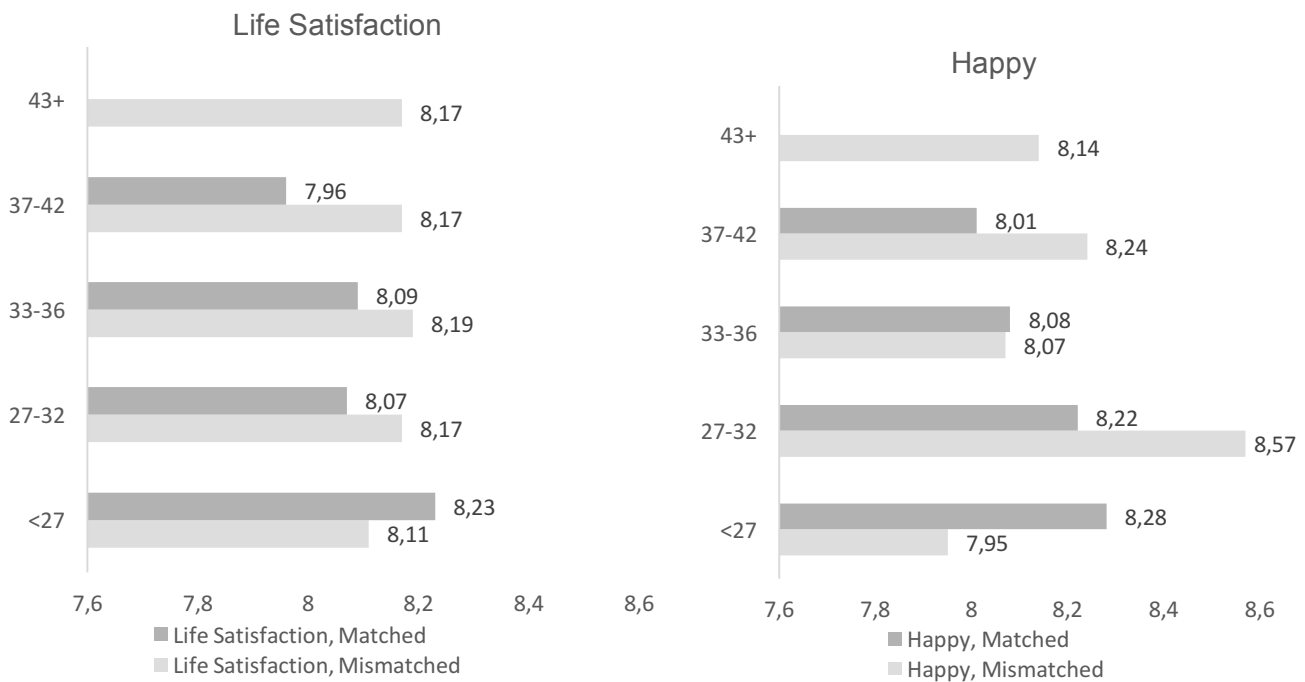
*Note:* The working time categories <27, 27-32 and 33-36 have been merged into the category <37 due to sample size restrictions.

As shown in Figure 5, the bivariate associations of the male sample provide no clear indications of that a match between usual and preferred working hours always is advantageously for SWB compared to mismatch. In such a case, we would have expected respondents who are matched to represent higher mean levels of SWB compared to the corresponding work category of mismatch, for all categories. The results do however suggest that being matched is associated with higher well-being levels *conditioned that the respondent does not work standard full-time (37-42)*. This can be seen by the higher mean levels for matched than mismatched working part-time (<37) and working long hours (43+). Interestingly,

the aspect of being matched or mismatched seems to matter the most for those working part-time. Regarding life satisfaction for those in part-time employment, we find the highest mean of them all for matched, while the lowest mean for mismatched. Further, an overall interesting observation is that we there is a pattern among respondents who are mismatched. Specifically, mean levels of both life satisfaction and happiness are increasing with the working hours. This suggests that *conditioned being mismatched*, working more is associated with higher SWB levels compared to working less (as the highest SWB means for mismatched are found in the category for long working hours).

### 8.2.1.2 Female Sample

**Figure 6.** Weighted mean levels of life satisfaction and happiness by usual working hours and matched/mismatched in the European Social Survey, 2010, for women.



Note: The working time category of match 43+ has been excluded due to sample size restrictions (less than 30 observations).

As can be seen in Figure 6, the bivariate associations of the female sample, similarly to the male sample, provide little indications of that being matched generally would be associated with higher well-being levels. On the contrary, only the lowest work category for part-time (<27) has higher mean well-being levels for those being matched than mismatched for both of the SWB measures. Overall, it actually rather seems like being mismatched is beneficial for SWB compared to being matched for most of the working time categories, which goes in the opposite direction of the expectations. Further, an overall

interesting observation for those who are matched is that *the SWB mean levels are decreasing with increasing working hours*. This suggests that cases of match for the shorter working time categories are associated with higher SWB levels compared to those who are matched in the higher working time categories. For respondents who are mismatched on the other hand, we do not identify any clear patterns. A rather counterintuitive observation is however that respondents who are mismatched in the category 27-32 hours represent a substantially higher mean level of happiness than all other categories.

## **8.2 Regression Analysis**

### **8.2.1 Main Results**

The results of the main regression analyses are presented in Tables 10 and 11, where a robust regression technique for OLS has been used and ESS weights have been applied (explained in Chapters 7.5 and 7.6). Table 10 shows the regression output connected to research question 1; *What are the associations between usual working hours and subjective well-being?*. The mismatch element, i.e. a dummy variable for whether the usual working hours are matched with preferred hours or not, is added for the regression in Table 11 by interacting the mismatch variable with categories of usual working hours. This allows for analysis of research question 2; *What are the associations between the match/mismatch of usual working hours and preferred hours and subjective well-being?*. Each table shows the results of four regressions, as they have been carried out separately for men and women, as well as for the two SWB measures life satisfaction and happiness.

The reader should be aware of that the variables are on different scales, which means that caution needs to be taken in the interpretation of the coefficients. All the prospective scales and reference groups are indicated next to the variables. The coefficients corresponding to variables on a certain scale are interpreted such as that a coefficient of one indicates that a one-unit increase of the explanatory variable is associated with a one-unit increase in the SWB scale. For example, one of the coefficients in Table 10 for subjective health is 0.27 and thus implies that a one-unit increase in the five-point health scale is associated with approximately a quarter of a unit increase of the 11-point scale for SWB. The variables of interest in Table 10 and 11, i.e. the working time variables, are all dummy variables and are thus mutually exclusive.

### **8.2.1.1 Usual Working Hours and SWB**

As outlined in Chapter 7.2 on the Empirical Model, the associations between usual working hours and subjective well-being were estimated through the following model:

$$SWB_i = \alpha + \beta \text{ working hours}_i + \gamma \text{ controls}_i + \varepsilon_i$$

The reference group for the variables of interest is the category of 37-42 usual working hours, which serves as a proxy interval for the standard hours of full-time work in Scandinavia. The coefficients for the working time variables denote the point change in the SWB score associated with each working time category in comparison with the reference group.

**Table 10.** The associations between subjective well-being (measured by happiness and life satisfaction, both 0 to 10 scales) and usual working hours (divided into different categories) for men and women.

	<b>Life Satisfaction</b>	<b>Happy</b>	<b>Life Satisfaction</b>	<b>Happy</b>
<b>Gender</b>	Men	Men	Women	Women
<b>Usual working hours (reference group: 37-42)</b>				
<27	0.28 (0.16)	0.27 (0.15)	0.35** (0.12)	0.16 (0.11)
27-32	0.17 (0.17)	-0.08 (0.16)	0.09 (0.10)	0.26** (0.10)
33-36	0.41* (0.16)	0.34* (0.15)	0.00 (0.12)	-0.15 (0.11)
43+	0.19** (0.07)	0.06 (0.07)	0.13 (0.10)	0.05 (0.10)
<b>Countries (reference group: Denmark)</b>				
Norway	-0.41*** (0.09)	-0.23** (0.09)	-0.07 (0.10)	-0.03 (0.10)
Sweden	-0.21* (0.08)	-0.07 (0.08)	-0.04 (0.09)	-0.11 (0.09)
<b>Age (reference group &lt;25)</b>				
25-34	-0.30 (0.16)	-0.45** (0.15)	-0.12 (0.18)	-0.20 (0.17)
35-49	-0.46** (0.16)	-0.61*** (0.15)	-0.32 (0.18)	-0.40* (0.17)
50 +	-0.51*** (0.16)	-0.69*** (0.15)	-0.17 (0.18)	-0.49** (0.17)
<b>Subjective general health (scale: 1 to 5)</b>	0.27*** (0.04)	0.27*** (0.04)	0.48*** (0.05)	0.38*** (0.04)
<b>Social activity compared to age (scale: 1 to 5)</b>	0.11** (0.04)	0.13*** (0.04)	0.19*** (0.04)	0.10* (0.04)
<b>Living with partner</b>	0.44*** (0.09)	0.45*** (0.09)	0.44*** (0.10)	0.55*** (0.09)

(Continued)

Table 10 (contd)

	<b>Life Satisfaction</b>	<b>Happy</b>	<b>Life Satisfaction</b>	<b>Happy</b>
<b>Gender</b>	Men	Men	Women	Women
<b>Children living at home</b>	0.15* (0.07)	0.04 (0.07)	-0.04 (0.08)	-0.05 (0.08)
<b>Belonging to minority ethnic group</b>	-0.22 (0.17)	-0.17 (0.16)	-0.32 (0.22)	-0.34 (0.22)
<b>Education (reference group: not completed high school)</b>				
Completed high school	0.00 (0.10)	-0.01 (0.09)	-0.11 (0.11)	-0.12 (0.11)
Bachelor or master	-0.06 (0.10)	0.00 (0.10)	-0.20 (0.11)	-0.28** (0.10)
Other post education	0.03 (0.10)	0.14 (0.10)	0.11 (0.11)	-0.01 (0.11)
<b>Feeling about household's income nowadays (scale: 1 to 4)</b>	0.42*** (0.06)	0.23*** (0.06)	0.08 (0.07)	-0.01 (0.06)
<b>Living in big city</b>	-0.15 (0.09)	-0.24 (0.08)	-0.22* (0.10)	-0.10 (0.09)
<b>Job satisfaction (scale: 0 to 10)</b>	0.23*** (0.02)	0.28*** (0.02)	0.28*** (0.02)	0.21*** (0.02)
<b>Limited or no employment contract</b>	-0.12 (0.13)	-0.04 (0.12)	0.02 (0.11)	0.07 (0.11)
<b>Self-employed</b>	-0.04 (0.10)	0.09 (0.09)	0.00 (0.13)	0.05 (0.13)
<b>Any period of unemployment and work seeking last 5 years</b>	-0.18 (0.12)	-0.05 (0.11)	0.02 (0.12)	-0.15 (0.12)
<b>Trust &amp; religious beliefs</b>				
Social trust (scale: 0 to 10)	0.03 (0.02)	0.05** (0.02)	0.04* (0.02)	0.04* (0.02)
Trust in key institutions (scale: 0 to 10)	0.05* (0.02)	0.03 (0.02)	0.10*** (0.02)	0.06** (0.02)
Religious beliefs (scale: 0 to 10)	0.02 (0.01)	0.03* (0.01)	0.03* (0.01)	0.03* (0.01)

(Continued)

Table 10 (contd)

	<b>Life Satisfaction</b>		<b>Life Satisfaction</b>	
	<b>Happy</b>	<b>Happy</b>	<b>Happy</b>	<b>Happy</b>
<b>Gender</b>	Men	Men	Women	Women
<b>Observations</b>	1288	1287	1111	1112
<b>Missing values</b>	43	42	48	47
<b>R-squared</b>	0.21	0.20	0.27	0.22
<b>Intercept</b>	3.02*** (0.38)	3.40*** (0.36)	1.97*** (0.43)	4.26*** (0.41)
<b>Mean</b>	8.07	8.06	8.09	8.12
<b>SD</b>	0.85	0.79	0.84	0.78

Notes: All figures are weighted population estimates. Standard errors in parenthesis. Further, \*, \*\* and \*\*\* signifies statistical significance at the 5, 1 and 0.1 percent levels, respectively. Controls for occupation, household (HH) income and dummy for missing value on HH income were included in the models but are not reported here for reasons of space. Results are available in the appendix; Table 21. Appendix C.

As shown in Table 10, the values for r-squared are very similar for three of the regressions, in the range 0.20 to 0.22. The regression conducted for the female sample with life satisfaction as the dependent variable stands out with a remarkable higher r-squared of 0.27. The r-squared values in our regressions are substantially higher than what is typically suggested for OLS regressions for happiness research (r-squared between 0.03 to 0.15), while they are comparable to the ones obtained by Fleche et al.'s (2011) unbalanced panel for the Scandinavian countries (see Chapter 3.5.5 for further reference on what r-squared values that can be expected).

The results in Table 10 show clearly different associations between SWB and usual working hours for the four regressions. Regarding the working time variables, none of the regressions have exactly the same set of significant variables and all coefficients are different. This proves both that the two SWB measures life satisfaction and happiness are differently associated with usual working hours, and that the associations between working time and SWB differ for men and women. The significant results for men are concentrated in the two working time categories closest to the reference group in both directions (33-36 hours and 43+ hours). For women on the other hand, the two significant results are found in the two lowest working time categories (<27 and 27-32). This confirms that the split of the sample by gender make sense.

For the male sample, the category of 33-36 hours (directly below the reference group) is positively associated with SWB in terms of both happiness and life satisfaction at the 5 percent significance level. The coefficients indicate that working hours in the range 33-36 are associated with around one-third of

a point higher happiness score and 0.4 of a point higher life satisfaction score compared to standard working hours. The positive association is in line with the bivariate associations in Figure 4, showing that the highest means for both SWB measures are found in the category 33-36 hours. Interestingly, this category is the only one that has a significant association with happiness, despite the fact that the reference group of 37-42 hours has a remarkable lower mean score than all other working time categories (7.46 compared to the others in the range between 8.01 and 8.20). The reason for that the regression results to some extent differ from what could have been expected from the bivariate associations is probably due to that the low mean score for happiness in the reference group is not associated with the working hours per se, but that the respondents in this group possess other traits that reduce the SWB score (e.g. lower job satisfaction). This proves the importance of an accurate model specification and the inclusion of control variables. The category of 43 hours and above (directly above the reference group) is positively associated with higher life satisfaction for men at the 1 percent significance level (coefficient of 0.19), but has no significant association with happiness.

Turning to the female sample, the two significant results are found in the two lowest part-time categories, both below 33 hours. Working hours below 27 hours are positively associated with approximately one-third of a point higher life satisfaction and working hours between 27 and 32 hours are associated with around one-fourth of a point higher happiness score compared to working standard full-time. Both results are significant at the 1 percent level and in line with the bivariate associations, as the significant results represent the categories with the highest mean scores for happiness and life satisfaction respectively. It can be noted though that the working time category of 43 hours and above only had slightly lower mean score for life satisfaction than the category of 27 hours and below (8.16 compared to 8.17), while only the latter one proved to be significant in the regression analysis.

Summarized, all significant results for usual working hours are positively associated with SWB compared to standard full-time work. The results indicate clear differences between women and men. The significant results for men are concentrated in the two categories directly below and above the reference group (33-36 hours and 43+ hours), while for women the significant results are found in the two part-time categories with the lowest amount of working hours (<27 hours and 27-32 hours). For men, the only working time category that is significantly positive associated with both life satisfaction and happiness is 33-36 hours. An interesting overall observation is that only three out of 16 coefficients are non-positive. With regards to the bivariate associations for men, the regression results did not suggest that the lower categories of part-time work are associated with any significantly lower SWB levels than full-time work as indicated by the bivariate analysis, whereas it was confirmed that there are



other more 'optimal'<sup>12</sup> working time categories than full-time. For women, the regression results were in line with the bivariate associations in that some categories of part-time employment represent significantly higher well-being levels than full-time employment.

### **8.2.1.2 Working Time Mismatch and SWB**

As outlined in Chapter 7.2 on the Empirical Model, the associations between the match/mismatch of usual working hours and subjective well-being were estimated through the following model:

$$SWB_i = \alpha + \beta (\text{working hours}_i * \text{mismatched}_i) + \gamma \text{controls}_i + \varepsilon_i$$

In line with research question 2, which aims to explore the associations between working time mismatch and SWB, the categories of usual working hours were further interacted with a dummy variable indicating match or mismatch according to the fit between usual and preferred working hours (the definition can be found in the Empirical Model, Chapter 7.2). This resulted in 6 and 10 mutually exclusive categories for the male and female sample respectively, with the reference group consisting of respondents with usual working hours in the interval 37-42 hours that are matched in the sense that they experience a fit between their actual (usual) and preferred working hours. The results of the four regressions for working time mismatch are presented in Table 11. The coefficients for the variables of interest denote the point change in the SWB score compared to the reference group.

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<sup>12</sup> With 'optimal' in this context and onwards, we refer to higher levels of subjective well-being. Observe that it does not make any implications concerning the direction of causality.

**Table 11.** The associations between subjective well-being (measured by happiness and life satisfaction, both 0 to 10 scales) and usual working hours by match/mismatch for men and women.

	<b>Life Satisfaction</b>	<b>Happy</b>	<b>Life Satisfaction</b>	<b>Happy</b>
<b>Gender</b>	Men	Men	Women	Women
<b>Working time mismatch (reference group 37-42 matched)</b>				
<27 Matched	-	-	0.45** (0.16)	0.46** (0.16)
<27 Mismatched	-	-	0.31* (0.16)	-0.02 (0.15)
27-32 Matched	-	-	0.08 (0.12)	0.22 (0.12)
27-32 Mismatched	-	-	0.22 (0.17)	0.53*** (0.16)
33-36 Matched	-	-	-0.01 (0.15)	-0.12 (0.14)
33-36 Mismatched	-	-	0.07 (0.19)	-0.07 (0.19)
<37 Matched	0.43** (0.14)	0.14 (0.13)	-	-
<37 Mismatched	0.20 (0.14)	0.22 (0.14)	-	-
37-42 Mismatched	0.04 (0.10)	0.00 (0.09)	0.05 (0.10)	0.14 (0.10)
43+ Matched	0.24* (0.12)	0.03 (0.12)	*	*
43+ Mismatched	0.17* (0.08)	0.05 (0.08)	0.17 (0.12)	0.16 (0.11)
<b>Countries (reference group: Denmark)</b>				
Norway	-0.43*** (0.09)	-0.24*** (0.09)	-0.06 (0.10)	-0.01 (0.10)
Sweden	-0.22** (0.08)	-0.07** (0.08)	-0.04 (0.09)	-0.10 (0.09)

(Continued)

Table 11 (contd)

	<b>Life Satisfaction</b>	<b>Happy</b>	<b>Life Satisfaction</b>	<b>Happy</b>
<b>Gender</b>	Men	Men	Women	Women
<b>Age (reference group &lt;25)</b>				
25-34	-0.26 (0.16)	-0.44 (0.15)	-0.11 (0.18)	-0.22 (0.17)
35-49	-0.41** (0.15)	-0.58** (0.15)	-0.31 (0.18)	-0.42* (0.17)
50 +	-0.48** (0.16)	-0.65** (0.15)	-0.18 (0.18)	-0.54** (0.17)
<b>Subjective general health (scale: 1 to 5)</b>	0.26*** (0.04)	0.27*** (0.04)	0.48*** (0.05)	0.38*** (0.04)
<b>Social activity compared to age (scale: 1 to 5)</b>	0.10* (0.04)	0.12* (0.04)	0.19*** (0.05)	0.10* (0.04)
<b>Living with partner</b>	0.44*** (0.09)	0.45*** (0.09)	0.44*** (0.10)	0.54*** (0.09)
<b>Children living at home</b>	0.11 (0.07)	0.03 (0.07)	-0.05 (0.08)	-0.07 (0.08)
<b>Belonging to minority ethnic group</b>	-0.12 (0.17)	-0.13 (0.17)	-0.31 (0.23)	-0.34 (0.22)
<b>Education (reference group: not completed high school)</b>				
Completed high school	-0.01 (0.10)	0.00 (0.09)	-0.13 (0.11)	-0.15 (0.11)
Bachelor or master	-0.07 (0.10)	-0.01 (0.10)	-0.22* (0.11)	-0.30** (0.10)
Other post education	0.03 (0.10)	0.16 (0.10)	0.11 (0.11)	-0.03 (0.11)
<b>Feeling about household's income nowadays (scale 1 to 4)</b>	0.38*** (0.06)	0.21*** (0.06)	0.08 (0.07)	-0.03 (0.06)
<b>Living in big city</b>	-0.12 (0.09)	-0.22 (0.08)	-0.22* (0.10)	-0.09 (0.09)
<b>Job satisfaction (scale: 0 to 10)</b>	0.24*** (0.02)	0.28*** (0.02)	0.29*** (0.02)	0.21*** (0.02)

(Continued)

Table 11 (contd)

	<b>Life Satisfaction</b>	<b>Happy</b>	<b>Life Satisfaction</b>	<b>Happy</b>
<b>Gender</b>	Men	Men	Women	Women
<b>Limited or no employment contract</b>	-0.08 (0.13)	-0.05 (0.12)	0.03 (0.12)	0.11 (0.11)
<b>Self-employed</b>	-0.06 (0.10)	0.07 (0.10)	-0.02 (0.13)	0.01 (0.13)
<b>Any period of unemployment and work seeking last 5 years</b>	-0.22 (0.12)	-0.09 (0.11)	0.04 (0.12)	-0.13 (0.11)
<b>Trust &amp; religious beliefs</b>				
Social trust (scale: 0 to 10)	0.04* (0.02)	0.05* (0.02)	0.05* (0.02)	0.04* (0.02)
Trust in key institutions (scale: 0 to 10)	0.04* (0.02)	0.03* (0.02)	0.10*** (0.02)	0.06** (0.02)
Religious beliefs (scale: 0 to 10)	0.02 (0.01)	0.03 (0.01)	0.03* (0.01)	0.03* (0.01)
<b>Observations</b>	1263	1262	1101	1102
<b>Missing Values</b>	66	67	58	57
<b>R-squared</b>	0.20	0.19	0.27	0.23
<b>Intercept</b>	3.25*** (0.38)	3.46*** (0.37)	1.91*** (0.43)	4.23*** (0.42)
<b>Mean</b>	8.07	8.06	8.09	8.12
<b>SD</b>	0.85	0.79	0.84	0.78

Notes: All figures are weighted population estimates. Standard errors in parenthesis. Further, \*, \*\* and \*\*\* signifies statistical significance at the 5, 1 and 0.1 percent levels, respectively. Controls for occupation, household (HH) income and dummy for missing value on HH income were included in the models but are not reported here for reasons of space. Results are available in the appendix; Table 22. Appendix D. The categories of 43+ for women have been excluded due to sample size restrictions (less than 30 observations)

The r-squared for the regressions in Table 11 above are very similar to the corresponding regressions in Table 10 (in the range 0.19 to 0.27 here compared to 0.20 to 0.27). For example, the regression conducted for the female sample with life satisfaction as the dependent variable has identical r-squared. We would like to point out that only the r-squared, as opposed to the adjusted r-squared, is reported here. The properties of r-squared is that it increases whenever a regressor is added to the model, unless the estimated coefficient on the added regressor is exactly zero (Stock & Watson, 2011, pp. 235-237). Despite that the regression here for working time mismatch entails more regressors than the previous

one for usual working hours, we do not see an increase in r-squared. This can be seen as an indication of that interacting the usual working hours with the dummy for mismatch has not added any notably higher explanatory power to the model, i.e. how well the OLS estimates of the regression line describes the data, compared the previous regressions that did not contain the aspect of mismatch.

The significant results for the regressions in Table 11 are generally found in the same categories of usual working hours as for the original regressions in Table 10. Similar to those results, no significant negative associations with SWB have been found for any combination of usual working hours and match/mismatch. This confirms the bivariate associations in Figure 5 and 6 respectively, which indicate that being mismatched does not necessarily need to be associated with lower SWB. Just as in the previous regressions, it is also confirmed here that the results look differently for men and women. It should however be noted that some of the variables of interest are arranged differently for men and women due to sample size constraints caused by the uneven distribution of observations. Furthermore, there are clear differences in the associations between working time match/mismatch and SWB depending on whether life satisfaction or happiness is used as dependent variable.

Considering the regressions for men, there are now fewer categories of usual working hours upon the inclusion of the mismatch element. As only around 12 percent of the male sample were distributed in the three lowest working time categories, these were merged into a single category for working hours below 37 hours (defined as part-time). The results show that working part-time is associated with a 0.43-point higher life satisfaction score compared to standard full-time work (significant at the 1 percent level), *conditioned that these working hours are matched with preferences*. This is in line with the bivariate associations, as being matched and working part-time represents the category with the highest mean SWB score of them all in Figure 5. There is however no significant association between the category being matched at part-time and happiness, and the positive association with life satisfaction does not hold when respondents in this category of working hours are mismatched with preferences. The only significant category of usual working hours from Table 10 for part-time employment is 33-36 hours (significant at 5 percent). As this category now is merged with the other categories of working hours below 37 hours, it is not possible to make any direct comparison here. The remaining significant results for men are found in the category of long working hours (43+), which is associated with a higher life satisfaction score at the 5 percent significance level, regardless of whether these working hours are matched or not with individual preferences. This corresponds well with the bivariate associations in Figure 5 showing relatively high scores for life satisfaction; 8.16 for mismatch and 8.26 for match. It is also in accordance with the regression results in Table 10, showing that usual working hours above

standard full-time are associated with a 0.19-point higher life satisfaction score. When the distinction between match and mismatch is made for these regressions, we see that this combined score in Table 10 lies in-between the coefficients for mismatch of 0.17 and the higher coefficient for match of 0.24. No significant results were found for the male sample in terms of happiness. Even though the results show no significant negative associations with SWB of being mismatched, the three results for men that are significantly associated with life satisfaction reveal higher coefficients for the matched significant results than the significant result for mismatch.

For the female sample, alike the results in Table 10, the significant results in Table 11 are also found in the two lowest working time categories (below 33 hours). The results here that include the mismatch element however provide additional findings. The significant positive association between working hours below 27 and life satisfaction still holds, regardless of whether matched with individual preferences or not. The coefficients and significance levels however indicate stronger positive associations when being matched – as the coefficient is approximately 50 percent higher than mismatched, and significant at 1 percent compared to 5 percent. A new result is that the category of working hours below 27 hours also has become significantly associated with happiness once matched, as opposed to the non-significant association in previous regression where matched and mismatched observations were caught up by the one single dummy for that category of usual working hours. The SWB associations for matched working hours below 27 is almost identical for the two SWB measures, as the category is associated with a bit below half of a point higher scores for both happiness and life satisfaction. An intuitively surprising result is that the strongest positive associations with happiness is found in the category 27-32 hours, *conditionally that a mismatch exists*. The positive association represents both the highest coefficient of all and also the only result that is significant at 0.1 percent level. The category of 27-32 hours mismatch is associated with more than half of a point higher happiness score. What is very astonishing is also that the same working time category is not significant when being matched with preferences. The results are however fully in line with what can be expected from the bivariate associations in Figure 6, as this category has the highest SWB mean of them all (8.57). The single category for women that was excluded due to sample size constraints was 43+ match, and thus no conclusions can be drawn for this category.

Summarized, the results show that mismatch is not 'detrimental' in the sense that no mismatch category was negatively associated with SWB compared to the reference of being matched at standard full-time. In fact, the result that indicated the strongest associations with subjective well-being was found in a mismatch category, and three out of the seven significant positive results were found in categories with

mismatch. However, the categories of usual working hours that has significant positive associations with SWB for both mismatch and match have higher coefficients for match. Hence, for a given category of usual working hours that is significantly positive associated with SWB, it generally holds that the positive associations seem stronger for being matched than mismatched. Only four out of 26 coefficients have negative signs, with none of them being significant and found in categories with both mismatch as well as match. Combining the overall results from Tables 10 and 11, there seems to be a clearer pattern with regards to the working hours per se (working time), than for whether these are matched with preferences or not. This holds for both men and women, though with very different patterns for the two genders.

### **8.2.1.3 How large are the associations?**

The results have now been reported for all the main regressions with regards to usual working hours as well as the extended model that interacts working time and working time mismatch. Now it is time to turn to the sizes of the associations, and assess whether they seem meaningful. The coefficients for all significant results in the eight regressions in the Tables 10 and 11 range between 0.17 and 0.53. This might at a first glance not seem that large given that the dependent SWB variables have an 11-point range. However, as was previously noted for Table 4 and 5 in Chapter 6.2 (Descriptive Statistics of Variables of Main Interest), approximately 90 percent of the respondents use the four highest points of the scale. Thus the fact that some working time categories are associated with up to half of a point higher SWB scores does indeed seem meaningful.

In order to assess the relative magnitude of the coefficients for the variables of interest, it can be helpful to compare these to crucial control variables. Prior research conducted for ESS data has shown that some of the most important SWB determinants according to strength are having a job, closely followed by the effects on having a partner, thereafter subjective health and subjective income (Van der Meer, 2014). These crucial SWB determinants are also in line with the reliable literature on the subject, e.g. Frey and Strutzer (2001). Since our samples only include the working population, it is not possible to make any comparison with the SWB associations of being unemployed. The other three crucial determinants are however included as control variables in our regressions, which allows comparison. The magnitude of the highest coefficients connected to working time are comparable to living with a partner, which on average in the regressions is associated with half of a point higher SWB score. Most of the coefficients for the working time variables are also similar to those of subjective health, i.e. a one-point increase in the five-point subjective health scale has a comparable relation with SWB as the significant working time categories. Furthermore, the magnitude of the coefficients for working time are also similar to a one-point increase in subjective income (feelings about household income) for men,

while belonging to a significant working time category has stronger associations with SWB than subjective income for women. Job satisfaction, which in the regressions is shown to be highly significant associated with higher SWB scores, has coefficients in the interval 0.21 to 0.29. To put this in relation to working time, a two-point increase of job satisfaction at the 10-point scale has an approximately comparable association with happiness and life satisfaction for women as being matched at usual working hours below 27. Based on the above analysis, we conclude that the magnitude of the associations between working time and SWB indeed seem meaningful.

#### ***8.2.1.4 Do the Control Variables Align with Expectations?***

While the estimated coefficients of the control variables are not central to this study, comparing the overall results for these with expectations is still important in terms of the model specification and thus the validity of the study. The coefficients of the control variables overall align very well with the expectations outlined in Chapter 7.4 (with the expectations being based on prior research). For example, both SWB scores in all eight regressions were found to be significantly positive associated with subjective health, social activity compared to age, living with a partner, job satisfaction, social trust and trust in key institutions. Out of these, the positive association between SWB and job satisfaction, living with partner and subjective health were always significant at the 0.1 percent level. It should be noted that job satisfaction is not always included in SWB research when the variables of interest are unrelated to work. The highly significant results however show that job satisfaction indeed is an important element for SWB in terms of both life satisfaction and happiness. Job satisfaction is associated with between approximately one fifth of a point and one third of a point higher SWB scores. The inclusion of job satisfaction as a control variable was crucial in this study, as it is intended to capture many of the subjective as well as objective aspects related to work into one single measure.

Some of the control variables were significant for only one of the genders. For men, SWB scores were significantly lower in Norway and Sweden compared to Denmark, while no such significant associations were found for women. The significant results for men are in line with that Denmark has the highest mean scores of SWB, as shown in Table 8 in Chapter 6.3.2 (Descriptive Statistics of the Individual Countries in the Pooled Sample). Age is supposed to have a U-shaped relationship with SWB, which in the regressions are shown by significantly lower scores for the age groups 35-49 and 50+ compared to the reference group of respondents below 25. The significant results for age were mainly found for men. Since the part of the population aged above 65 are excluded from this sample, it is not possible to see the whole U-shaped relation for age in these regressions. Having children living at home has in prior research been shown to have an ambiguous relation with SWB, which is also confirmed here by that



only one coefficient out of eight is significant. However, the signs of the coefficients show a pattern according to gender, as the coefficients are negative for women and positive for men. A result that was especially gender-bound was feelings about the household income. This serves as a measure of subjective income, which in prior research has shown to have a highly significant effect on SWB and to be much more important than actual income. In our regressions, the subjective income was associated with significantly higher SWB scores at the 1 percent level for men for both happiness and life satisfaction, while not significant at all in any of the regressions for women. The significant coefficients for men range between 0.21 and 0.42, with almost double the size for life satisfaction compared to happiness. Religious beliefs on the other hand were always positively significant for women, while this was not the case for men. The coefficients for trust and religious beliefs were generally very low compared to all other significant variables. The occupational dummies in Appendix D (Table 22) also show gender differences, with trade/craft workers having a significantly lower SWB score for women, while significantly higher SWB scores for men. In fact, the coefficient of trade work for women is the only one above the absolute value of one (-1.27), which implies that trade work is associated with more than a one-point lower life satisfaction score.

Some of the included control variables in our regressions have been shown to have an ambiguous relation to SWB in prior research, and has generally not always been included as control variables. This goes for example for living in a big city or not, the type of employment contract, previous unemployment and self employment. These were all included in our regressions, as omission of e.g. whether the employment contract is secure or not can otherwise lead to that its effect instead is incorrectly caught up in the dummy variables for working time (causing omitted variable bias). The ambiguous or questionable control variables were in general not significant in our regressions, but the signs of the coefficients are however in line with expectations. This suggests that they to some extent can contribute to the model specification despite that they are non-significant. The educational dummies showed overall little or no significance, which coincides with the findings of van der Meer (2014), who also used ESS data. It might be that the inclusion of the dummies for occupation and income already catches some of the effects of education, as all to some extent might be related to social status. Almost all coefficients for bachelor or master degree were negative, and significantly associated with approximately third of a point lower happiness for women. The educational level is not significantly related to life satisfaction though. A potential explanation for the lower happiness level for women could be that those with a degree possess some common personality traits that might have a negative association with SWB, e.g. high self-pressure.

The results for absolute income, measured by the household income on a 10-point scale in comparison to the rest of the population, are the ones that match the least with expectations. Even though subjective income is supposed to strongly outweigh absolute income in importance, absolute income has still been shown in numerous studies to be positively associated with SWB. We do not find any support for this in the results reported in Appendix C and D (Table 21 and 22). For men, income deciles above the reference group are generally significantly negative associated with lower SWB than average incomes. For women, the results do not contradict prior research to the same extent, but yet only the very lowest income decile is associated with lower SWB than average incomes. These confusing results probably show that using absolute income measures do not make sense when not accounting for the household size. For example, an income in decile 5 has a very different implication for the living standard if it concerns a single-person household, or if the income is to be shared between several household members. Most previous research showing that absolute income to some extent is associated with higher SWB has used methods to account for the household size, which is probably the reason for the different results for our sample.

Overall, the signs and significances of the control variables are very much in line with the expectations that are backed up by prior research. The most questionable result is the one concerning the absolute household income. This can most likely be explained by the insufficient use of the household income decile to measure absolute income, as it has not been weighted according to the household size.

### **8.2.2 Complementary Regression Analyses**

Along the analysis of the main results that were reported in Tables 10 and 11, there has come up some further concerns that we find interesting to explore. Based on the results in Table 11, we could not confirm that a match always is associated with a higher SWB score than a mismatch between actual and preferred working hours. This suggested that working time mismatch seems subordinated to the actual working time. The decision of the direction for further analysis is based on an initial validation of the approach that the actual amount of working hours seem to have stronger associations with SWB than the mismatch component. To validate this, we first report the results from two further regressions confirming that match/mismatch seems irrelevant for SWB. On the basis of this, the further complementary regression analyses were carried out with respect to usual working hours, thus excluding the interaction variable for working time mismatch. The complementary analyses were conducted for subgroups of the female sample to explore whether potential common traits connected to different groups of individuals could reveal further insights in the relation between working hours and SWB. Splitting the original full female sample naturally implies a reduced amount of observations in

each subsample. As Table 6 showed, the distribution of the male sample is too concentrated in the two highest categories of usual working hours (standard full-time and above) to allow for a further split of the sample. Based on this, all the regression analyses for subsamples were only conducted for the female sample (after the presentation of the following two first results for mismatch for both men and women). Common for all complementary analyses below is that the same set of control variables have been used as for the main analyses. Since the control variables do not change notably for the different regressions and they are not in the focus of current study, only the variables of interest have been reported to save space.

#### **8.2.2.1 Mismatch in Absolute Hours**

Up to this point, a match or mismatch between usual and preferred working hours has been treated as a binary variable. One possible weakness with this approach is that mismatch is assumed to have the same association with SWB regardless of the absolute size of the gap between usual and preferred working hours. This is inconsistent with the PE fit theory, which predicts that the SWB penalty increases with the gap (described in Chapter 4.1.5 in the Theoretical Framework). As the main results in Table 11 show no clear support for the relative importance of match/mismatch for SWB, we wished to validate these results by re-estimating the previous regression models towards taking the size of the mismatch into account. For this purpose, the working time variables were replaced with a single variable for working time mismatch. The new variable measures the absolute difference between usual working hours and preferred hours (0 for match), with the result reported in Table 12. The same set of control variables as in the main regressions have been used here (which is also the case for all the following regressions).

**Table 12.** *The associations between subjective well-being and mismatch in absolute hours for men and women.*

	<b>Life Satisfaction</b>	<b>Happy</b>	<b>Life Satisfaction</b>	<b>Happy</b>
<b>Gender</b>	Men	Men	Women	Women
Absolute difference between usual and preferred hours:				
<b>Mismatch (in hours)</b>	0.006 (0.006)	0.008 (0.006)	0.004 (0.005)	0.006 (0.004)
Observations	1098	1097	1101	1102
Missing Values	231	232	58	57
R-squared	0.180	0.179	0.262	0.218
Intercept	3.616*** (0.403)	3.760*** (0.390)	2.145*** (0.429)	4.263*** (0.418)
Mean	8.065	8.058	8.094	8.124
SD	0.852	0.785	0.843	0.776

*Notes:* All figures are weighted population estimates. Standard errors in parenthesis. Further, \*, \*\* and \*\*\* signifies statistical significance at the 5, 1 and 0.1 percent levels, respectively. Controls for country, age, subjective general health, social activity compared to age, children living at home, belonging to minority ethnic group, education, feelings about household's income nowadays, living in big city, job satisfaction, limited or no employment contract, self-employed, any period of unemployment and work seeking last 5 years, trust and religious beliefs, occupation, HH income and a dummy for missing value on HH income were included in the model.

The results are consistent with previous findings, suggesting that the aspect of mismatch is unrelated with SWB. This can be seen by that all coefficients are close to or equal to zero and non-negative, and so are the t-values<sup>13</sup>. As a last validation of accounts for the direction of the mismatch. From the prior research discussed in the literature review (Chapter 5), we see that it has been common conduct to distinguish between underemployment and overemployment. The latter implies that the individual's usual working hours exceed the preferred hours, while underemployment indicates the opposite. The results are reported in Table 13 for the two variables of interest; one for overemployed workers and one for underemployed workers, accounting for the absolute difference between usual and preferred working hours. The same control variables are used as for the previous regression.

<sup>13</sup> The t-value equals the coefficient divided by the standard error.

**Table 13.** *The associations between subjective well-being and mismatch by overemployment and underemployment in hours, for men and women.*

	<b>Life Satisfaction</b>	<b>Happy</b>	<b>Life Satisfaction</b>	<b>Happy</b>
<b>Gender</b>	Men	Men	Women	Women
Absolute difference between usual and preferred hours:				
<b>Underemployment (in hours)</b>	0.004 (0.008)	0.009 (0.008)	0.007 (0.009)	-0.003 (0.009)
<b>Overemployment (in hours)</b>	0.008 (0.008)	0.006 (0.008)	0.003 (0.005)	0.008 (0.005)
Observations	1098	1097	1101	1102
Missing Values	231	232	58	57
R-squared	0.180	0.179	0.261	0.219
Intercept	3.634*** (0.404)	3.763*** (0.390)	2.124*** (0.430)	4.288*** (0.419)
Mean	8.065	8.058	8.094	8.124
SD	0.852	0.785	0.843	0.776

*Notes:* All figures are weighted population estimates. Standard errors in parenthesis. Further, \*, \*\* and \*\*\* signifies statistical significance at the 5, 1 and 0.1 percent levels, respectively. Controls for country, age, subjective general health, social activity compared to age, children living at home, belonging to minority ethnic group, education, feelings about household's income nowadays, living in big city, job satisfaction, limited or no employment contract, self-employed, any period of unemployment and work seeking last 5 years, trust and religious beliefs, occupation, HH income and a dummy for missing value on HH income were included in the model.

The results in Table 13 above are almost identical to the ones in Table 12; both results suggest that mismatch is rather irrelevant for SWB. The latter regression shows that this holds irrespective of whether the mismatch concerns overemployment or underemployment. Based on the regressions in Tables 12 and 13, combined with main regression analyses, we conclude that whether the usual working hours are matched or not with preferred hours has no significant association with SWB, at least not as a general rule. Accordingly, the further analyses are conducted for subsamples of the female sample, with regressions for usual working hours that exclude the mismatch component. The same set of control variables are used as in the main regressions.

#### **8.2.2.2 Female Subsamples: Children Living at Home**

Serving as a reference for the following regression analyses for the female subsamples, the main regressions showed a pattern of that the two lower categories of part-time work generally are associated

with higher subjective well-being scores for women, compared to standard full-time work. In Table 10, working hours below 27 hours were significantly positive associated with higher life satisfaction, while working hours in the category 27-32 hours were positively associated with higher happiness levels.

As approximately half of the female sample have children living at home (which can be seen by the coefficient 0.53 for the dummy variable 'Children living at home' in Appendix B; Summary Statistics of Control Variables), an interesting aspect to look into is whether the associations look differently for those with children compared to respondents without children living at home. It could be assumed that mothers potentially prioritize leisure differently than those without children, resulting in differences in the SWB maximization patterns. Presumably, women with children might prioritize leisure higher in order to spend more time with the child. On the other hand, it has been shown in Booth and Van Ours (2008) that women with children value having a job even higher than those without children. The amount of work implies a trade-off between spending time with the child and providing income, the latter partly or fully determining the living standard for the household. To explore whether there are any differences in SWB associations for those with and without children, we ran regressions for two subsamples for the female sample; one with respondents having children living at home and another one for respondents without children living at home. The results are reported in Table 14.

**Table 14.** *The associations between subjective well-being and usual working hours, for women with children living at home respectively without children living at home.*

Children	Life Satisfaction		Happy	
	YES	NO	YES	NO
<b>Usual working hours (reference group: 37-42)</b>				
<27	0.42* (0.17)	0.41* (0.17)	0.28 (0.16)	0.13 (0.17)
27-32	0.05 (0.13)	0.17 (0.16)	0.11 (0.13)	0.46** (0.16)
33-36	0.03 (0.15)	0.03 (0.20)	-0.12 (0.14)	-0.31 (0.21)
43+	0.27* (0.14)	0.03 (0.16)	0.16 (0.13)	-0.06 (0.16)
<b>Observations</b>	625	486	625	487
<b>Missing values</b>	12	36	12	35
<b>R-squared</b>	0.29	0.32	0.27	0.26
<b>Intercept</b>	3.33*** (0.76)	1.53* (0.64)	5.12*** (0.71)	4.51*** (0.64)
<b>Mean</b>	8.08	8.11	8.16	8.09
<b>SD</b>	0.82	0.87	0.76	0.80

*Notes:* All figures are weighted population estimates. Standard errors in parenthesis. Further, \*, \*\* and \*\*\* signifies statistical significance at the 5, 1 and 0.1 percent levels, respectively. Controls for country, age, subjective general health, social activity compared to age, children living at home, belonging to minority ethnic group, education, feelings about household's income nowadays, living in big city, job satisfaction, limited or no employment contract, self-employed, any period of unemployment and work seeking last 5 years, trust and religious beliefs, occupation, HH income and a dummy for missing value on HH income were included in the model.

In Table 14, the overall pattern from the original female sample remains as three out of four significant results are found in the two lowest part-time time categories. What is very interesting is that the results in Table 14 are the first ones to show a significant result above 33 hours for women. Surprisingly, the significant results for women with children are found in the two “extremes” – working hours of 43 or above and working hours below 27 are associated with significantly higher life satisfaction scores than standard full-time (37-42 hours). It is worth noting though that the significant results for women with children are only seen with regards to life satisfaction, and not happiness. The fact that the significant results for women with children are found in the two extremes might suggest that higher life satisfaction is associated with either working little and hence have more time for the child, or working long hours

and in that way provide more income to the household.

The question is whether the significant coefficients for the two extremes has anything to do with whether leisure can be afforded while maintaining a decent living standard? We will return to looking into whether women with children that carry a higher responsibility for the household income, i.e. has a higher proportional contribution to the household income, value work higher. This assumption also implies that mothers with less responsibility for providing the household income potentially can afford more leisure, thus valuing leisure higher. Before exploring this further (with subsamples combining the aspect of having children living at home or not and the proportional contribution to income), we will next look into the importance of the proportional contribution to household income in isolation.

### ***8.2.2.3 Female Subsamples: Proportional Contribution to Household Income***

The trade-off between income and leisure for utility maximization was previously described in the Theoretical Framework (Chapter 4). In line with that intuition, the incentive to work might vary depending on the difference one's own income makes for the total household income. For example, single-person households that rely completely on their own income (full contribution to the household income) might have higher incentive to work compared to people that has a partner who provides the majority of the household income. We wish to look further into whether the associations between working time and SWB might vary depending on the respondents' contribution to the household income. To do so, we run regressions for three subsamples according to proportional contribution to household income; less than half, around half and more than half. The results are presented in Table 15.



**Table 15.** The associations between subjective well-being and usual working hours, for women contributing with less than half of the HH income, half of HH income and more than half of HH income.

Proportion HH income	Life Satisfaction			Happy		
	<50%	50 %	>50%	<50%	50 %	>50%
<b>Usual working hours (reference group: 37-42)</b>						
<27	0.09 (0.17)	* (0.19)	0.53 (0.29)	0.08 (0.15)	* (0.17)	0.23 (0.27)
27-32	-0.06 (0.15)	0.50** (0.19)	0.14 (0.23)	0.17 (0.14)	0.30 (0.17)	0.35 (0.22)
33-36	0.05 (0.20)	0.04 (0.22)	-0.04 (0.23)	-0.08 (0.19)	-0.45* (0.20)	-0.20 (0.22)
43+	-0.04 (0.20)	0.02 (0.20)	0.48** (0.18)	-0.10 (0.19)	-0.01 (0.17)	0.48** (0.17)
<b>Observations</b>	409	310	398	410	310	398
<b>Missing values</b>	13	6	29	2	6	29
<b>R-squared</b>	0.23	0.35	0.35	0.27	0.33	0.30
<b>Intercept</b>	1.87* (0.8)	2.44* (0.96)	1.82* (0.75)	2.88*** (0.76)	4.67*** (0.86)	4.90*** (0.71)
<b>Mean</b>	8.29	8.23	7.83	8.28	8.36	7.84
<b>SD</b>	0.74	0.84	0.92	0.73	0.71	0.84

Notes: All figures are weighted population estimates. Standard errors in parenthesis. Further, \*, \*\* and \*\*\* signifies statistical significance at the 5, 1 and 0.1 percent levels, respectively. Controls for country, age, subjective general health, social activity compared to age, children living at home, belonging to minority ethnic group, education, feelings about household's income nowadays, living in big city, job satisfaction, limited or no employment contract, self-employed, any period of unemployment and work seeking last 5 years, trust and religious beliefs, occupation, HH income and a dummy for missing value on HH income were included in the model. The categories of <27 when Proportion of HH income equals 50 per cent have been excluded due to sample size restrictions (less than 30 observations).

The results in Table 15 show that there is a significantly positive association between working hours above standard full-time (43+ hours) and both life satisfaction and happiness, but only *conditionally that the respondent contributes with more than half of the HH income*. This is fully in line with what could be expected – a higher proportional income implies a larger responsibility for the household's living standard, and thus more incentive to work longer hours. These results are significant at the 1 percent level and high in magnitude; long working hours are associated with half of a point higher SWB scores compared to standard full-time work. This is the first regression that indicates that working more than full-time also can be have a positive relation with happiness, and not only life satisfaction. No significant results are however found for those providing less than half of the household income. The positive

significant results for the category of 27-32 hours are in line with the associations previously found for the original female sample. A new result is that a negative association with happiness is shown for those working 33-36 hours and providing half of the HH income. All the significant coefficients in Table 15 are similar in absolute value and relatively large in magnitude.

#### **8.2.2.4 Female Subsamples: Children Living at Home and Proportional Contribution to Household Income**

By running the regressions for the previous subsamples according to whether the respondent has children living at home or not, respectively according to the proportional contribution to income, we have seen totally new associations between subjective well-being and working time. As opposed to the full female sample in the main regressions, now positive associations with SWB have also been revealed for women working more than standard full-time, *conditionally that they have children living at home or that they provide more than half of the household income*. We now wish to combine these two aspects. We anticipate that the reason for the seemingly odd association that women with children generally have a higher life satisfaction when working long hours can be connected to a high proportional contribution to the household income. This means a higher responsibility for the living standard of the household and thus the child, implying that more work is valued higher compared to when the respondent carries less responsibility for the income. The results in Table 16 represents women with children living at home, divided into two subsamples according to the proportional contribution to household income, here excluding those providing half of the income.

**Table 16.** *The associations between subjective well-being and usual working hours, for women with children divided into two subgroups according to the proportional contribution to the HH income: less than half and more than half.*

Proportion HH Income	Life Satisfaction		Happy	
	<50%	>50%	<50%	>50%
<b>Children</b>	YES	YES	YES	YES
<b>Usual working hours (reference group: 37-42)</b>				
<27	0.09 (0.23)	*	0.15 (0.22)	*
27-32	-0.12 (0.19)	*	-0.02 (0.18)	*
33-36	-0.15 (0.24)	*	-0.06 (0.23)	*
43+	0.15 (0.28)	0.58* (0.25)	0.18 (0.26)	0.51* (0.22)
<b>Observations</b>	254	200	254	200
<b>Missing values</b>	4	4	4	4
<b>R-squared</b>	0.29	0.41	0.31	0.45
<b>Intercept</b>	3.65** (1.31)	2.13* (0.99)	4.87*** (1.24)	4.40*** (0.88)
<b>Mean</b>	8.35	7.73	8.38	7.78
<b>SD</b>	0.66	0.95	0.69	0.86

*Notes:* All figures are weighted population estimates. Standard errors in parenthesis. Further, \*, \*\* and \*\*\* signifies statistical significance at the 5, 1 and 0.1 percent levels, respectively. Controls for country, age, subjective general health, social activity compared to age, children living at home, belonging to minority ethnic group, education, feelings about household's income nowadays, living in big city, job satisfaction, limited or no employment contract, self-employed, any period of unemployment and work seeking last 5 years, trust and religious beliefs, occupation, HH income and a dummy for missing value on HH income were included in the model. The categories below 37 hours when Proportion of HH income is above 50 per cent have been excluded due to sample size restrictions (less than 30 observations).

The results in Table 16 are fully in line with the expectation of that the positive association between life satisfaction and long working hours for women with children in Table 14 is conditionally that the respondent carries the main responsibility for the household income (contributing with more than half of the household income). It should be noted that the coefficient of 0.53 is the highest one so far for any working time variable, implying a large positive magnitude for this subgroup. Furthermore, the positive association for long working hours for women providing the main part of the income also holds for happiness. Due to sample size restrictions, it is not possible to say anything about the associations for

women working part-time and providing more than half of the household income. Overall, the results in Table 16 provide support for that working much, which commonly implies higher income than working little, is valued higher relatively to leisure for women with children living at home and carrying the main responsibility for the household income.

#### **8.2.2.5 Female Subsamples: Generations**

It has been suggested in the media that different generations value leisure and work differently. The so-called baby boomers, the oldest generation currently in the labour market, are known for their willingness to work long hours. Generation Y, or “millennials”, are often said to value work-life balance and thus leisure more than the old generation (Ivey Business Journal, 2011). To test these assumptions for our sample, the original female sample was divided into the three generations; baby boomers, generation X and generation Y<sup>14</sup>. The results are reported in Table 17.

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<sup>14</sup> Baby boomers are defined as people born between 1946-1964 (for our sample this category was extended to 1945, i.e. including the respondents aged 65), generation X born 1965-1978 and generation Y born 1979-1997. The definitions of the age spans for the different generations are based on O'Neill (2010).

**Table 17.** *The associations between subjective well-being and usual working hours, for women divided into subgroups according to generation: baby boomers, generation X and generation Y.*

Generation	Life Satisfaction			Happy		
	Baby B	X	Y	Baby B	X	Y
<b>Usual working hours (reference group: 37-42)</b>						
<27	0.36* (0.17)	0.73*** (0.19)	-0.36 (0.36)	0.20 (0.18)	0.50* (0.19)	-0.54 (0.31)
27-32	0.19* (0.14)	0.09 (0.16)	-0.03 (0.33)	0.29* (0.14)	0.15 (0.16)	0.32 (0.27)
33-36	-0.13 (0.17)	0.27 (0.17)	* (0.17)	-0.23 (0.18)	-0.07 (0.18)	* (0.18)
43+	0.12 (0.14)	0.36* (0.16)	* (0.16)	-0.13 (0.14)	0.16 (0.17)	* (0.17)
<b>Observations</b>	532	426	153	532	426	154
<b>Missing values</b>	20	7	21	20	7	20
<b>R-squared</b>	0.33	0.34	0.43	0.24	0.27	0.45
<b>Intercept</b>	1.63** (0.59)	1.70** (0.61)	-1.54 (1.45)	4.17*** (0.59)	3.93*** (0.62)	0.93 (1.24)
<b>Mean</b>	8.21	8.02	7.93	8.13	8.15	8.05
<b>SD</b>	0.81	0.84	0.94	0.76	0.75	0.88

Notes: All figures are weighted population estimates. Standard errors in parenthesis. Further, \*, \*\* and \*\*\* signifies statistical significance at the 5, 1 and 0.1 percent levels, respectively. Controls for country, age, subjective general health, social activity compared to age, children living at home, belonging to minority ethnic group, education, feelings about household's income nowadays, living in big city, job satisfaction, limited or no employment contract, self-employed, any period of unemployment and work seeking last 5 years, trust and religious beliefs, occupation, HH income and a dummy for missing value on HH income were included in the model. The categories above 32 hours for Generation Y have been excluded due to sample size restrictions (less than 30 observations).

The results in Table 17 do not show any support for what was previously suggested concerning the baby boomers' willingness to work long hours. Instead, the opposite seems to be true here as the significant result for this generation is found in the part-time category with the shortest amount of working hours, which is positively associated with SWB. Generation X on the other hand show positive results for both short and long working hours. Due to sample size restrictions, the categories of 33-36 and 43+ hours were not included for generation Y. The mainly negative coefficients and the lack of significant results in the two lower working time categories however suggest that the younger generation do not value work-life balance to the extent of working hours below 33 hours, compared to working full-time.

In interpreting the results for the different generations, it should be noted that the baby boomers include the respondents up to 65 years of age. It might be that the generation of baby boomers have been valuing work higher while they were younger, but that prioritizations change with age and as they approach retirement. It is possible that the significant results for part-time work for baby boomers reflect that many of them may e.g. have grandchildren that they want to prioritize, and that higher SWB can be associated with more leisure and thus more time for e.g. helping with caretaking of their grandchildren. However, we would like to point out that these just are examples of possible explanations, as the results in Table 17 do not provide any suggestions for the reasons behind the generational differences.

#### ***8.2.2.6 Female Subsamples: Educational Degree***

Friedland and Price (2003) defined underemployment as that people may be underemployed by hours, income, skills or status. People are “skill-underemployed” when their job does not afford them the opportunity to put their skills and training into use. “Status-underemployment” represents when the job provides less occupational status than expected on the basis of the educational background (Friedland & Price, 2003). Even though we do not look into to what extent the workers put their skills and training into use, nor whether the occupational status corresponds with expectations, the hypothesis is that the amount of usual working hours yet potentially can show some indications of this. High-demanding or high-status jobs are generally associated with full-time work or more (i.e. long working hours). We wish to look into whether different levels of education could show different associations between working time and subjective well-being. Table 18 shows the results of the relation between usual working hours and SWB for respondents with an educational degree (here defined as bachelor level and above) respectively without a degree.

**Table 18.** *The associations between subjective well-being and usual working hours, for women in the subgroups with and without and educational degree.*

Degree	Life Satisfaction		Happy	
	YES	NO	YES	NO
<b>Usual working hours (reference group: 37-42)</b>				
<27	0.31 (0.21)	0.39* (0.15)	0.31 (0.21)	0.07 (0.14)
27-32	-0.18 (0.18)	0.20 (0.13)	0.08 (0.18)	0.31** (0.12)
33-36	-0.43* (0.19)	0.22 (0.16)	-0.44* (0.20)	-0.03 (0.15)
43+	0.14 (0.12)	0.13 (0.17)	0.09 (0.13)	0.00 (0.16)
<b>Observations</b>	494	621	494	622
<b>Missing values</b>	19	25	19	24
<b>R-squared</b>	0.34	0.26	0.28	0.25
<b>Intercept</b>	1.29 (0.76)	2.33*** (0.57)	3.90*** (0.77)	4.19*** (0.52)
<b>Mean</b>	8.01	8.15	8.02	8.18
<b>SD</b>	0.81	0.87	0.75	0.79

Notes: All figures are weighted population estimates. Standard errors in parenthesis. Further, \*, \*\* and \*\*\* signifies statistical significance at the 5, 1 and 0.1 percent levels, respectively. Controls for country, age, subjective general health, social activity compared to age, children living at home, belonging to minority ethnic group, education, feelings about household's income nowadays, living in big city, job satisfaction, limited or no employment contract, self-employed, any period of unemployment and work seeking last 5 years, trust and religious beliefs, occupation, HH income and a dummy for missing value on HH income were included in the model.

The results in Table 18 suggest that working time is differently associated with SWB depending on the respondent's educational attainment. A negative association between for the working time category 33-36 hours (the category right below standard full-time) and both SWB measures was found for women with an educational degree, compared to working standard full-time. This is fully in line with the assumption that those with a degree want to make full use of their skills and obtain higher status by having jobs that normally implies full-time work or more. The coefficients of the negative associations for the category below full-time are also relatively large, implying more than 0.4 of a point lower SWB scores than those working full-time. No such associations were found for the respondents without a degree. Instead, these results are more in line with the findings for the full female sample in Table 10,

namely that working hours in the two lowest categories of part-time work are associated with higher SWB scores.

### **8.3 Summary of Empirical Results**

The overall results for both the male and female samples suggested that the amount of working hours (working time) is more importantly associated with subjective well-being than whether the usual working hours match with preferred hours (working time mismatch). The main results indicated that the patterns of the associations between working time and SWB were gender-bounded. For women, SWB was generally positively associated with working time below 33 hours. The pattern looked differently for men, as SWB was positively associated with working hours right below and above standard full-time. All results are reported in reference to standard full-time work (37-42 hours). Overall, the main regression results indicated that the 'optimal' amount of working hours is lower for women than for men in terms of associations with SWB. However, when the associations between working time and SWB were further investigated by complementary regression analyses for different subgroups of the female sample, completely new associations between working time and SWB were found for women.

For the female subsamples, we could for the first time uncover significantly negative associations between working time and SWB compared to standard full-time, as all significant coefficients were positive for the main regressions. The negative associations with SWB were found for women with an educational degree in the working time category right below full-time. Another completely new finding was that long working hours may be positively associated with both happiness and life satisfaction for women in specific subgroups. The significant positive coefficients for work above standard full-time was found for women with children living at home, women providing the main part of the household income, as well as for the combination of these two; women with children living at home and providing the main part of the household income. The latter group showed the strongest SWB associations in terms of coefficients – working hours above full-time for this subsample are associated with half of a point higher happiness and almost 0.6 of a point higher life satisfaction. Most of the results for the different female subsamples were in line with expectations. This was however not the case for the regressions with the subsamples by generation – the two older generations seem to value leisure more than the youngest generation Y, while the expectation was that generation Y would be the one valuing work-life balance the most. A proposed explanation was that age-related aspects, such as having grandchildren or approaching retirement, might influence the results. Overall, the results for the female subsamples



suggest that the patterns for working time and subjective well-being do not only differ by gender, but that the patterns also may look differently for specific subgroups within a sample. Due to sample size restrictions, it was however not possible to test whether this also holds for the male sample.

## **8.4 Robustness Checks**

To test for the robustness of the results, we also ran the regressions with standard OLS (with heteroscedasticity-consistent standard errors), i.e. not applying the robust M estimation technique. The overall results for standard OLS were similar to the reported results with the robust M estimation, but there were however also some differences, most likely due to OLS' sensitivity to outliers. This can serve as an indication of that the results are not completely dependent on the M estimation technique, which confirms the robustness of the results, but that the applied technique for the reported results seemingly yield more valid results (suggested by that the estimated coefficients of other covariates fit better with the expectations and the large amount of bad outliers).

The robustness of the results was further confirmed by that the exclusion of some control variables does not change the results notably. Additionally, the fact that two SWB measures have been used instead of one shows that the robustness of the overall results is not completely dependent on only one chosen SWB measure. The overall conclusion is that the reported empirical results have a seemingly high robustness.

The original plan was to also test the robustness of the results by applying different techniques for treating the missing values in the regressions, e.g. imputation of values as a complement to the the applied list-wise deletion. However, as our approach for choosing the variables in such a way that missing values were avoided to the largest possible extent resulted in few missing values (approximately 5 percent excluded observations by list-wise deletion), we made the assessment of that different treatments of missing values would not make much difference for the overall results. Further, we assumed the remaining missing values to be random (as we for example added a variable for 'missing income' to avoid non-random missing values), which make list-wise deletion a valid technique (Newman, 2014).

## 9. Discussion

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*In this Chapter we discuss the results from the regression analysis. Specifically, we discuss how the results compare to previous research, which theories and hypotheses receive confirmation and the generalizability of the results. Furthermore, we discuss the wider implications of the results, policy recommendations, limitations and shortcoming of the study. At the very last, we provide suggestions for future research.*

### 9.1 Overall Discussion of the Results

This study examined the associations between working time and two measures of subjective well-being; life satisfaction and happiness, with regards to the Scandinavian working population. The basis of the methodology has been to run regressions examining both the aspect of the *actual amount* of working hours in terms of usual working hours, as well as the aspect of *working time mismatch* by accounting for whether the usual hours are matched with individual preferences. The main regressions were carried out for men and women separately, complemented by analysis of different subgroups of the female sample, all conducted for representative samples from the European Social Survey's fifth round from 2010. The following overall discussion is based on the results from the main regressions.

In the context of widespread popular interest in the potential benefits to the working population's well-being of introducing a shorter workweek than the current standard full-time, the main regression analyses showed that the general associations between working time and SWB differ for men and women. In line with hypothesis three (see Hypotheses in Chapter 4.2) derived from the theory of the social production function, SWB was found to be positively associated with a lower amount of usual working hours for women than for men. In the thesis introduction, we brought up some experiments on working time reductions in Scandinavia, with the current trial at Svartedalen's nursery home<sup>15</sup> representing one example. In line with the preliminary results for Svartedalen's experiment of going from a 40-hours week to a 30-hours week (with remained salary) with increased SWB as a result, our results confirm that working hours in a similar range to that after the working time reduction at Svartedalen are associated with higher SWB for women. Concerning our results for men though, we find no support for

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<sup>15</sup> From here onwards also referred to as 'Svartedalen'.

that part-time work in terms of a 30-hours week would be associated with any significantly different levels of SWB compared to standard full-time work.

Out of the four hypotheses outlined in this thesis, we would argue that our results are most in line with hypothesis three (which in the essence says that part-time employment is associated with higher levels of SWB among women, while full-time employment is associated with higher levels of SWB among men, compared to full-time). Our results suggest that part-time employment below 33 hours is associated with higher levels of SWB among women compared to standard full-time work. Consequently, hypothesis three is partly confirmed in that two out of three categories of part-time employment are positively associated with SWB for women, while no such evidence was found for the highest category of part-time work (33-36 hours). For men, our results contradict the third hypothesis in the prediction of that full-time employment would be associated with the highest levels of SWB. Instead, we found that usual working hours slightly below or above full-time, specifically 33-36 hours and 43+ hours, are associated with higher SWB for men than standard full-time (37-42 hours). Hence, while we do not fully confirm the thesis' third hypothesis, we do confirm the main essence of it; higher levels of SWB among men is associated with a higher amount of working hours than for women. As a consequence, we reject the thesis' first hypothesis (*conditionally that income is accurately controlled for, subjective-wellbeing decreases with the working hours*) and second hypothesis (*full-time employment is associated with higher levels of subjective well-being compared to part-time employment*) as those do not distinguish between the associations between working time and SWB for men and women. It should be noted though that the results for women somehow support hypothesis one in that higher SWB is associated with the two lowest working time categories (<27 and 27 – 32 hours). This leads us however not to confirm hypothesis one, as for in that case working hours above standard full-time would have been negatively associated with SWB compared to full-time (which is not supported by our results). Most unexpectedly, our results show no support for the forth hypothesis (*a mismatch between usual working hours and preferred working hours is associated with lower levels of subjective well-being, compared to a match*). This is shown in the results by that there are no significant negative results for any category of mismatch compared to the reference group of match at standard full-time.

Throughout the thesis, we have been careful to describe the identified relationships between working time and SWB as associations rather than effects. We do not intend to discuss any direction of the causality here either, and would like to highlight the importance of not trying to do so. First, it has been brought up that time-invariant aspects such as personality largely determine SWB, which our data set has not allowed us to control for. This could mean that the average relationships we have identified are

being driven by individuals with specific unobserved traits. Secondly, an alternative chain of causality could be other unmeasured exogenous events acting as stressors for either higher or lower levels of SWB for certain categories of working hours. We cannot discount the possibility that unmeasured factors, both time-invariant as well as time-varying, might partially account for our results. The fact that we cannot say anything about causality means that we cannot reject the possibility of that e.g. a positive association between SWB and long working hours for men does not necessarily mean that it is the amount of working hours that cause a higher level of SWB, but that it could be reverse – that men with higher SWB generally work longer hours.

Regardless the chain of causality, the prevailing point is that our results still can provide valuable insights on the associations between working time and SWB, which advantageously could be kept in mind for policy makers when e.g. evaluating the effects of experiments with working time. On the basis of our results, we can for example point out that it is important to realize that specific case experiments should not alone serve as a basis for guiding policy decisions. We base this conclusion on that our results show that the associations between working time and SWB might look very differently for men and women, as well as for different subpopulations. Despite the representative samples used in current study, the only thing that was required to find completely new associations was to divide the full female sample into two or three groups based on certain common traits. We will not re-state results for the different subsamples here, but instead refer to the complementary regression analyses (Chapter 8.2.2), and rather point out that there are large differences between the subsamples. For example, for women with children living at home or providing the main part of the household income, or a combination of these two aspects, long working hours (above standard full-time) are associated with higher levels of SWB compared to working full-time. These findings thus point in a completely different direction than the results obtained for the full female sample. With this in mind, it is important for policy makers and employers to acknowledge the weaknesses of specific case experiments in the desire to generalize the results to the broader population. For example, it is important to acknowledge that the employees at Svartedalen's nursery home are mainly women and that the experiment concerns one specific industry, meaning that there is a high possibility that these employees share some common traits that might influence the results. Our suggestion with regards to this is that policy decisions concerning working time should be very cautious in generalizing findings from case experiments, and rather collect information from several different sources. Results derived from case experiments ought to be combined with knowledge from academically-driven studies based on samples that are representative for the

population of interest, and this is why we believe that our study can provide a valuable contribution to the existing knowledge in the field.

We would now like to look into how our results compare with other studies in the area, initially with regards to the first body of literature on working time (outlined in Chapter 5.1). Our finding that part-time employment is associated with higher levels of SWB among women is consistent with the overall findings in the first body of literature. Our results regarding the associations between usual working hours and SWB for men do however diverge to some extent from the previous overall findings, in that we reject that full-time work would be associated with the highest levels of SWB. It should be noted that our results are not too far off though – in that our significant results are found in the two working time categories right below and above standard full-time. In the literature review, we also brought up some diverging results on whether long working hours are detrimental to SWB. Booth and Van Ours (2009) suggested that there are particularly large detrimental effects on SWB for women working more than 40 hours per week, based on the Australian HILDA survey. Contrasting this, the study by Rudolf (2014), with causality-based results for the working time reduction reform in Korea from 44 to 40 normal working hours, drew the conclusion that long working hours are not detrimental to SWB. The results of our study coincides with those in that we did not find any significant negative associations between SWB and long working hours (in our study defined as 43+ usual working hours). This finding holds both with regards to the full female and male samples, as well as for the female subsamples. It should however be noted that Rudolf's study from 2014 is based on the amount of normal working hours, as opposed to usual working hours (see definition in Chapter 2.3). But the main conclusion of that there is no significant negative association between SWB and long hours of work still holds.

As previously mentioned, our most unexpected finding is that we see very little similarities between our results and the ones in the second body of literature, accounting for working time mismatch. The general conclusion from studies in the second body of literature is that it is not the actual amount of work that matters for SWB, but that it is the aspect of whether the actual working hours match with preferred hours that is crucial. In relation to Angrave and Charlwood (2015) and Wooden et al. (2009), their overall results show that being mismatched is negatively associated with SWB regardless of the amount of usual working hours, which we find no support for in our results. Going further into the specifics, we will next make some comparisons between our study and the study by Angrave and Charlwood (2015), as it represents our main source of inspiration. They further showed that being matched while working part-time is positively associated with SWB for men, which is the only result that directly coincides with ours. Interestingly though, Angrave and Charlwood (2015) showed some counterintuitive results regarding

women with usual working hours in the interval 21-34. Their results indicated a significantly *negative association of being matched* or underemployed for this work interval, whereas no significant negative association was found for being overemployed. Similarly, our results also showed counterintuitive results specifically for women with usual working hours between 27-32, as we find a significantly *positive association between being mismatched and SWB*, but not for being matched. The fact that both the results in our study and theirs show counterintuitive results specifically for women working part-time might indicate that the respondents in this category possess some certain unmeasured traits that both studies have failed to fully control for. If that is the case, it proves the difficulties in getting the model specification right in the complex area of SWB research, despite that Angrave and Charlwood (2015) use panel data and account for individual fixed effects.

We are astonished to see that our results diverge much from the second body of literature while fitting much better with the first body of literature, as the second body of literature generally points out the weaknesses of the studies in the first body of literature. In looking into the potential causes of the different results in our study compared to the second body of literature, we will next explain some main differences and similarities in the regression methodologies. We followed a similar setup of the regressions accounting for working time mismatch as in the studies by Angrave and Charlwood (2015) and Wooden et al. (2009). Alike them, we also created different categories of usual working hours and further interacted these with a mismatch dummy variable, with approximately the same reference group (we use 37-42 hours matched, whereas they use 35-40 hours matched). However, a clear difference between the setup in the previously mentioned studies and ours is that they further distinguish between two types of mismatch; underemployment for those who prefer to work more than their current hours, and overemployment for those who wish to work less than currently. This difference represents one possible explanation for why our results differ from previous studies, as all the studies that were mentioned within the second body of literature distinguish between underemployment and overemployment. Some of their results for mismatch holds for both under- and overemployment, e.g. in Angrave and Charlwood (2015) both under- and overemployment were associated with significantly negative SWB for men working 35-40 hours, while only overemployment at 41-49 hours was found to have a negative association with SWB. Hence, as our categories of mismatch denote a 'merged' association for both under- and overemployment, and if these aspects imply different associations, then the combined association will be the weighted average of these. With regards to this, we conclude that we cannot discount the possibility that our main results regarding working time mismatch would have

looked differently if under- and overemployment would have been distinguished (which our sample sizes did not allow for).

Besides the difference in that previous studies distinguish between under- and overemployment while ours merge those into mismatch, another potential cause of the differences between our results and the second body of literature is the question formulation of preferred working hours in different surveys. Angrave and Charlwood (2015) use the BHPS, Wooden et al. (2009) use the HILDA survey, and we make use of the ESS, with the question formulations of preferred hours differing to some extent between all. Common for all of them is that the respondents are asked to take into account that their chosen number of preferred hours would affect their income. A clear difference is however that the BHPS only give the respondent three alternatives of preferred hours in relation to their current hours; work more, less or the same amount of hours (about the same in the HILDA survey). In ESS on the other hand, the respondents are asked to state an exact amount of preferred hours. As the respondents are asked directly to state their preferred hours in all three surveys, this type of measured fit falls into the category of perceived fit. It was previously brought up that perceived fit allows for the greatest level of cognitive manipulation. One possible explanation contributing to the different results is that it might be harder for the respondents to evaluate the exact amount of preferred hours, allowing for more cognitive manipulation than just choosing from three alternatives. Further, in accordance with income habituation and that the individuals strive to maintain a positive self-concept, it might be that the respondents in our study are reluctant to state an amount of preferred hours that differ too much from their current ones. One indication of that this possibly could be the case is found in the descriptive statistics in Chapter 6.3.1. With regards to our female sample, we see that the preferred working hours on average lie approximately 2, 3 and 5 hours below the usual working hours for Norway, Sweden and Denmark respectively, with the same figure for men being approximately 3, 5 and 6 hours. Related to this, it should be kept in mind that we have defined mismatch as a difference between usual and preferred hours of 5 hours or more, meaning that the average person in Norway, and the average woman in Sweden, will be categorized as matched even though they have stated that they would prefer to work a few hours less than their current. If the question formulation in the BHPS survey would have been used instead, it might have been the case that they still would have indicated that they wanted to work less than their current hours, but that they in that case would have been categorized as mismatch. The question formulation in the HILDA survey is however more similar to ours in that a match is defined as that they would have preferred to work *around* the same amount of hours as their current. Nonetheless, the fact that the question formulations in the different surveys differ can potentially be one source of the different results.

The question formulations regarding the preferred hours of work in the studies used by Angrave and Charlwood (2015) and Wooden et al. (2009) are indeed more similar to one another than the question formulation that we base our study on, and we believe that the latter allow for a larger cognitive manipulation in the measured perceived fit.

Moreover, we complemented our main analysis of working time mismatch, in which binary measures are used for match/mismatch, with two regressions accounting for the absolute difference between usual and preferred hours (see Chapter 8.2.2.1). As Wooden et al. (2009) pointed out that one possible weakness in using binary measures for mismatch is that the degree of mismatch is not accounted for, we followed their approach directly in re-estimating our first regression models by replacing the initial dummy variables with a variable for the absolute mismatch. In the first complementary regression we use one single mismatch variable for the absolute difference in hours, while the second complementary regression uses two variables that distinguish between under- and overemployment (in absolute hours), the latter one following exactly the same approach as in Wooden et al. (2009). Their results show significant negative associations with life satisfaction, both with regards to under- and overemployment for men and women, with slightly larger negative effect for overemployment. Despite that we here have followed the same approach as Wooden et al. (2009) for our complementary regressions, as opposed to a bit different approach for the main analysis as discussed above, we still get completely different results from theirs. Our conclusion from the main analysis is just further confirmed – that a mismatch does not have any significant negative association with SWB. The fact that this conclusion still holds while distinguishing between under- and overemployment might signalize that the previous discussed difference in conclusion between our study and the second body of literature does not rely completely on our previous definition of mismatch after all. We believe that the consensus in our different regressions of that a mismatch is not associated with lower SWB strengthens the validity of that this actually could be the case with regards to our sample. That leads us to a last possible explanation of why our results differ from the previous research – that there actually are differences between different regions/cultures. Thus, while the results in e.g. Angrave and Charlwood (2015) and Wooden et al. (2009) hold for their studied populations in the UK and Australia, our results might suggest that the associations between working time and SWB look differently for the Scandinavian working population.

As the results of our study now have been discussed in relation to both the first and second body of literature, we next turn to discuss our results in relation to the theoretical framework. It was previously mentioned that our results show partial support for hypothesis three, while we rejected the remaining hypotheses. We will now discuss this more thorough for one hypothesis at a time.



We based hypothesis one on the neoclassical theory of labour supply, which in the essence says that individual labour supply is determined as a trade-off between leisure and income. This normally implies that there is a certain amount of work for which utility (here approximated by SWB) is maximized regarding both aspects of the trade-off. However, as we have aimed to control for income in our regressions, both in terms of subjective income (feelings about household income) and absolute income (the household decile), the related hypothesis was based according to these premises. Conditionally that income is accurately controlled for, then SWB should only be maximized according to the highest amount of leisure time. Hence, the hypothesis following the neoclassical theory of labour supply while controlling for income should be that SWB increases with leisure time, or decreases with the working hours. In the context of our regressions with standard full-time (37-42 hours) serving as a reference, if hypothesis one would be true, then there should have been a pattern of positive results for usual working hours below the reference, while negative results for hours above the reference. There are however no such patterns in our regressions, which is the basis for rejecting hypothesis one. Our findings support those of Rätzel (2012), who found that increasing working hours are associated with higher life satisfaction levels even if income is held constant, which explains why unemployed individuals on average have lower SWB than that of employed people. This suggests that the neoclassical theory of labour supply is insufficient in explaining choices of labour supply in that it does not account for the social aspect. We would however also like to mention that we believe that there is a substantial risk of that income has not been fully controlled for in our regressions, which was the premise for the hypothesis to hold. This belief is based on that we see relatively counterintuitive results regarding the associations between the household income and SWB, which probably are caused by that the number of household members have not been accounted for.

While the neoclassical theory of labour supply cannot explain our results, the social production function is more suited for that purpose. As previously mentioned, the social production function is an extension of the neoclassical theory of labour supply in that it also accounts for social approval in the trade-off, which numerous of previous studies have shown to be a crucial element. We formulated two different hypotheses based on the social production function, with hypothesis two being that full-time employment is associated with higher levels of SWB compared to part-time employment, as it implies a higher conformity to the prevailing norms. We based the hypothesis on that full-time work can be seen as the current societal norm, as both our descriptive statistics (see Chapter 6.2.2) and the statistics for the Scandinavian labour market overall (see Chapter 2.1) show that working hours in the range of full-time clearly dominates among men and women. Hypothesis two can however undoubtedly be rejected as

almost all regressions, both the main ones as well as the complementary ones, show significantly positive associations for other working time categories compared to full-time. There is however one exception to this rule – no category of working hours has a significant positive association with SWB compared to full-time among women providing less than half of the household income. Nevertheless, there are neither any significantly negative coefficients for that subsample, which lead us to reject hypothesis two for all samples.

While we reject hypothesis two, our results do partially support hypothesis three, based on another possible interpretation of the social production function. It was confirmed that part-time employment is associated with higher levels of SWB among women, while working hours slightly below an above full-time are associated with higher levels of SWB among men – however not full-time as hypothesized for men. In line with what was outlined in the theory of the social production function, our results suggest that women can comply with the social norm and gain social approval despite working notably less than the most common working hours in Scandinavia. This is in line with the evidence from prior research of that women experience much less SWB penalty than men from unemployment, as it does not necessarily mean that women diverge that much from the norm by becoming unemployed, whereas men's social approval relies on their work to a larger extent. Since part-time work currently is much more common among women than men, it is also natural that the norms in terms of working hours differ for men and women. Looking more specifically into the significant results for men, 33-36 hours is associated with higher levels of both happiness and life satisfaction. Thus, contradictory to some prior evidence, our results suggest that part-time work can be associated with higher SWB than full-time – conditionally that it does not differ too much from the most common working hours. The positive association for the interval 33-36 hours might indicate that in line with the social production function, SWB can be maximized both in terms of that social approval can be maintained by working relatively close to full-time, while in the same time having more leisure time (in line with the trade-off in the social production function between leisure, social approval and income, the latter one being controlled for in our regressions). The fact that long working hours only are positively associated with life satisfaction, while not for happiness, clearly show that working time might be differently associated with SWB depending on the measure being used – which confirms the relevancy of that our study uses two measures of SWB. Long working hours can be a source of status and thus increase life satisfaction, while status in terms of long working hours in our regressions for men are not associated with happiness, which is a more emotional SWB measure. A potential explanation for why our study reveals higher SWB for working hours slightly below full-time, while several other studies have shown that full-time is optimal

for men, is that the societal norms might differ between different regions. As shown in the key indicators of the Scandinavian labour market (Chapter 2.1), there is a substantial higher proportion of men working part-time in Scandinavia compared to the rest of Europe – which means a different reference for social approval. Also compared to the previous literature that has shown that full-time is optimal for men, we see a clear pattern of that these samples have a higher mean for usual working hours for men compared to our sample. The different results between Scandinavia and other countries possibly indicates the importance of the reference group for social approval. Further, we see indications of that the social reference group might be important for the associations between working hours and SWB with regards to the different results for the different female subsamples. For example, working hours in the interval of 33-36 hours are associated with lower SWB compared to full-time for respondents with a higher educational degree, whereas a lower amount of working hours are associated with significant higher SWB for those without a degree.

As previously thoroughly discussed, we can reject hypothesis four, i.e. our results indicate no evidence of that a mismatch between usual and preferred hours would be associated with lower levels of SWB, compared to a match. This also means that the person-environment fit theory does not seem to explain our results, or at least the aspect of working time mismatch seems subordinated the actual amount of working hours, even though the results indicate that being matched at a certain level of usual working hours generally seems advantageous (higher coefficient and/or more significant) for a given amount of working hours. Thus, even though the person-environment fit theory is rejected, it seems as it can help to describe the results to some extent.

Summarized, we conclude that the theory of the social production function can explain our results well. This means that labour supply, i.e. the amount of working hours, is determined by a trade-off between income, leisure and social approval. This is much in line with what could have been expected, as the neoclassical theory of labour supply is insufficient in that it does not account for the social aspect. Women's SWB is positively associated with a lower amount of working hours than for men, which might suggest that the norm for men and women for social approval still differ, despite Scandinavia being in the forefront of gender equality. Our results suggest that men's SWB is associated with not differing too much from the social norm of standard full-time, however higher SWB can either be associated with a bit less work than full-time by the benefit of increased leisure, or by working more than the norm and in that way receive status benefits. Even though we can conclude that the norms for men and women seem to differ, driving the different results for men and women, there is also evidence of that long working hours are associated with higher SWB for women in certain subgroups. This can be seen as a

proof of that the general results for the average man and woman might not be as gender-driven as it first may seem. From our complementary regressions, a general pattern is that for women with more responsibilities in terms of having children and/or serving as the breadwinner, i.e. providing the main part of the household income, long working hours are associated with higher SWB. This indicates that the results of the full-sample regressions for the different genders might be driven by the fact that it is yet more common for men to provide a larger part of the household income, and that this drives the general result of the higher 'optimal'<sup>16</sup> amount of working hours for men than women. We also saw that part-time work can be 'optimal' for men in Scandinavia, while previous research from other countries generally has shown that full-time is 'optimal'. This might further be seen as driven by the higher gender equality in Scandinavia than most other countries, which results in a smaller gender gap between men and women concerning the norm for working hours in Scandinavia. This is totally in line with what can be expected from the social production function; as the norms are changing and the more equalized the society gets, the less difference can be expected for men and women regarding the associations between working time and SWB. In line with this, if a totally equalized society is achieved at some point in the future, we believe that we will see no differences between the genders in the choice of labour supply.

## **9.2 Generalizability of the Results**

As the European Social Survey is carried out in a professional manner that is intended to ensure a representative sample, the results in this study can be generalized to the population of interest – namely the working population in Scandinavia. It is however important to keep in mind that the results hold for the average individual (as outlined in Chapter 3.5.4), but that in practice there may be great individual differences in the specifics of the SWB function. This became evident from the fact that our complementary analyses suggested that the associations between SWB and working time differ for different subgroups of the female working population – and that the associations also rely on other traits besides gender.

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<sup>16</sup> Optimal in this context means significant positive results compared to the reference of working full-time.

### **9.3 Wider Implications and Policy Recommendations**

In the thesis' introduction, we stated that we are of the belief that our results can be relevant for policy makers. Hence, we would like to provide a recommendation regarding working time and subjective well-being. It should however be noted that we suggest the results from our study to be complemented with other studies, due to the acknowledged limitations outlined in the subsequent section. Regardless, our study provides an original contribution in that, to our knowledge, there are no existing similar studies for the Scandinavian countries. Furthermore, the main results spitted by gender are complemented by results for a range of different subgroups of the female population, which we have not seen for any other study in the area. Without these, the main results could have been interpreted as women would be better off by working less than men with regards to the associations with SWB. However, the subgroups evidently showed that this would be an invalid recommendation. With all results at hand, it is very clear that there does not exist any 'one size fits all' concerning working time. With regards to this, our main recommendation is that employees should be given a higher degree of freedom in deciding their own working hours, and in that way maximize their SWB with regards to working hours. The results indicate that the associations between working time and SWB are indeed meaningful. We are aware of that it might seem contradicting to recommend more individual freedom in labour supply concerning that the results show little support for the person-environment fit theory. Nonetheless, even though the results show that being mismatched for different amount of working hours is not associated with significantly lower SWB than being matched at full-time, there are still indications of that being matched at a given level of usual working hours can be more positively associated with SWB than being mismatched.

The sample statistics in Table 7 revealed that about half of the population are unsatisfied with their current working hours (with the definition of match here allowing for an absolute difference of 4 hours, meaning that even more respondents are mismatched when accounting for exact fit), indicating that a large part of the population is not free to determine their working hours by themselves. If there would be policy changes giving workers more freedom in determining their own labour supply, there are indications that the average usual working hours would decrease (as the average preferred hours lie below the average usual hours for both men and women as seen in Table 8). This would in turn mean that the norm in terms of working hours would change towards a lower amount of usual working hours, which in the longer run might lead to that the average usual working hours would stabilize in an optimal equilibrium where they equal the average preferred hours. A higher degree of individual freedom in determining the labour supply would also mean that individuals could adjust the working hours to optimize their labour supply according to their current life situation, as our results suggest that e.g.

having children imply other associations between working time and SWB than not having children. Further, our results do not show any indications of that long working hours would be detrimental to SWB as no negative associations were found between SWB and working hours above standard full-time. All in all, we conclude that a higher degree of individual freedom in determining labour supply implies potential for a higher overall subjective well-being for the Scandinavian working population, while our results suggest that introducing a universal working time reduction has no such potential.

## 9.4 Limitations to the Study

At this point, we find it appropriate to acknowledge some of the limitations of this study. As will be uncovered further in this section, the limitations have mainly emerged from the cross-sectional nature of the ESS data, sample size restrictions, and the availability of some specific variables. The possible implications of these limitations will be discussed, followed by recommendations for future research.

First of all, two main limitations of this study have emerged from the cross-sectional nature of the ESS data. Specifically, as we have applied cross-sectional as opposed to panel data for our analysis, it has not been possible to control for individual fixed effects (e.g. personality characteristics). Moreover, cross-sectional data means that no claims can be made about the direction of causality. As outlined in Chapter 3.5, individual time-invariant traits or fixed effects has previously been found to account for a sizeable proportion of the variance in SWB measures. On this basis, we acknowledge that there is a likelihood that our estimates may be biased to some extent, posing a threat to the validity of the results. It should however be emphasized that Wooden et al. (2009) provides evidence that supports the claim that the estimated associations are likely to remain statistically significant irrespective of whether fixed effects have been accounted for, but that the magnitude of the associations are likely to be exaggerated in the absence of fixed effects. Further, the fact that it is not possible to establish any causal relationship for cross-sectional data, mean that our results leave the following important question unanswered: *Does working time affect people's SWB, or are people with high/low SWB more likely to work more/less?* This question is however of great importance for welfare policy decisions.

Several limitations of this study are connected to sample size restrictions. First of all, sample size restrictions led to that under- and overemployment needed to be merged into a single variable labelled "mismatched". As outlined in the literature review, distinguishing between under- and overemployment

has been common conduct in the most recent and prevailing research that assess working time mismatch (e.g. Wooden et al., 2009; Angrave & Charlwood, 2015). As prior research has provided somewhat different evidence of the associations between working time mismatch and SWB for under- and overemployment, our approach may be a possible explanation as to why our findings deviate from previous ones conducted for other populations. For example, as brought up in the literature review, Wunder and Heineck (2013) only found a significant negative association between SWB and underemployment for men, but not for overemployment. Thus, we cannot discard the possibility that combining these two dimensions of working time mismatch into one variable may hinder us to uncover significant associations. However, the fact that we do distinguish between under- and overemployment in the complementary analyses with the same main conclusions regarding working time mismatch as for the main regressions supports the validity of our findings. Further, sample size restrictions have led to the limitation that the complementary regression analyses only could be carried out for the female sample, but not for the male sample due to the small amount of observations distributed in the lower working time categories.

Another limitation of this study is related to how we measure subjective well-being, i.e. by using single-item scales as opposed to multi-item scales. As brought up in Chapter 3.3 (Measuring Subjective Well-being), multi-item scales generally have both higher validity and reliability than single-item scales as random measurement errors tend to be smaller on average, and because of the broader range of components of SWB that are considered explicitly. The ESS data set however contains no such variables, but instead ESS apply advanced methods to correct for measurement errors, and to ensure both the validity and reliability of the measures. On this basis, we have relied on the recommendation by Frey and Stutzer (2001) that a single-item scale is suitable for economic research, an approach which is underpinned by the fact that this is also the most prevailing approach in the existing literature.

A last limitation that we wish to emphasize is related to the variable we have applied for household income. As previously mentioned, the household income variable included in our regressions did not account for the number of members in the household, and the results in relation to this variable were not in line with expectations. A possible implication of this limitation is that the household income variable does not fully capture the income effect, which again suggest that there is a possibility that e.g. the working time categories also capture the income effect to some extent, and not only the hours worked per se.

## 9.5 Suggestions for Future Research

Overall, this study has served as a starting point in investigating the associations between SWB and working time in Scandinavia. On this basis, we highly encourage future research within this field, and that these studies address the limitations of current study.

For future research, we first of all suggest a differentiation of mismatch along the dimensions underemployment and overemployment – and to apply several measures of mismatch in the case that results are dependent on these methodological aspects. The reason behind this suggestion is that for any significant associations to be uncovered, it is crucial for policy makers to have knowledge on whether underemployment or overemployment, or both, represents a SWB penalty in order to make correct decisions on this matter. Further, we suggest that the variable for household income takes the number of household members into consideration. Additionally, we encourage future studies to assess the associations between SWB and working time/working time mismatch not only between genders, but also for other subgroups of the working population. This includes that we recommend not only looking into the subgroups investigated for our female sample on a male sample, but also to further identify other potential groups in the population – as the evidence suggest that associations are indeed likely to differ.

The use of longitudinal data would be ideal both to account for fixed effects, and to establish the causal relationship between usual working hours and SWB. As of today however, such an approach is not feasible for Scandinavian research on this matter, as there exists no longitudinal data which contains the necessary variables to investigate the relationship between SWB and working time/working time mismatch. Valuable insights into this field are thus contingent on that initiatives are made to collect such data. It is however our belief and hope that such data will be collected in the time to come, as a result of the increasing focus on applying alternative welfare indicators than GDP alone for economic policy – such as SWB measures, and that working time is indeed highly topical in Scandinavia today.

At last, as our results suggest that a higher degree of individual freedom in determining labour supply could potentially lead to higher overall subjective well-being, we encourage future studies to investigate on the potential implications of the implementation of measures with the objective of ensuring higher degree of individual freedom – for other aspects than SWB. As outlined in Chapter 1.3 on the delimitations to the study, other aspects than the associations between working time and SWB fall outside the scope of this study. SWB is however only one of many welfare indicators that policy makers can seek to optimize. We thus highly encourage future research to take on a welfare perspective; e.g.



what are the productivity and profitability implications of that individuals have more freedom in choosing their own labour supply?, and to take on a macro perspective; e.g. what are the societal and economic implications of that individuals have more freedom in choosing their own labour supply?

## 10. Conclusion

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The primary purpose of this study was to examine the associations between working time and subjective well-being for the working population in Scandinavia. Specifically, we aimed to answer the following two research questions: (1) *What are the associations between usual working hours and subjective well-being?* (2) *What are the associations between the match/mismatch of usual working hours and preferred hours and subjective well-being?*. Further, we intended to draw conclusions on whether it is the working time per se that is most strongly associated with SWB, or if it is the fit between actual and preferred working hours. Through examining the associations between usual working hours and subjective well-being for men and women separately, as well as for a range of different subgroups of the female population, a range of different associations have been uncovered – suggesting dependencies on life circumstances.

Overall, the results related to this study's first research question suggest that part-time work is positively associated with subjective well-being for women, while subjective well-being for men is positively associated with working hours slightly below full-time, as well as working hours above standard full-time (that is, long working hours). The results provide support for the theory of the social production function, implying that individual well-being in relation to labour supply is determined as a trade-off between the three dimensions income, leisure and social approval. The lower amount of 'optimal' working hours for women than men indicates that the norms for social approval in the context of working time differ by gender, despite Scandinavia being among the most equalized regions. This could explain why we see different associations between working time and subjective well-being for men and women. However, once looking into different subgroups of the population, the differences that first may seem gender-bound might rather be driven by other common traits or life circumstances.

The results in relation to this study's second research question suggest that a mismatch between actual and preferred working hours does not imply any significant lower SWB compared to being matched at full-time. That is, we find no evidence of that a mismatch between actual and preferred working hours would be negatively associated with subjective well-being – which is indeed in contrast to the conclusions drawn from our replicating studies from the UK and Australia. Instead, we conclude that the *actual amount* of working hours seem more importantly associated with subjective well-being than the fact of whether the usual working hours are matched with preferred hours.

All in all, the wide range of different associations between working time and subjective well-being that have been uncovered in this study clearly show that there is no 'one size fits all' concerning working time. With this in mind, we encourage policy makers to promote more individual freedom in decisions of labour supply. Providing individuals with tools for maximizing well-being with regards to working hours has the potential for welfare gains in terms of increased overall subjective well-being of the working population.

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# Appendix

## Appendix A. ESS Variable Description

**Table 19.** *Appendix A. ESS Variable Description*

<b>Variable (Renamed)</b>	<b>Variable (Original ESS Name)</b>	<b>Definition</b>	<b>Variable treatment</b>
Life Satisfaction	stflife	"All things considered, how satisfied are you with your life as a whole nowadays? (Scale 0 to 10, where 0 means extremely dissatisfied an 10 means extremely satisfied)	-
Happy	happy	"Taking all things together, how happy would you say you are?" (Scale 0 to 10, where 0 means extremely unhappy an 10 means extremely happy)	-
Usual working hours	wrkhtot	"Regardless of your basic or contracted hours, how many hours do/did you normally work a week (in your main job), including any paid or unpaid overtime"	Generated dummy variables. Please see chapter 5.3.2 for a detailed description.
Preferred usual working hours	wkhsch	"How many hours a week, if any, would you choose to work, bearing in mind that your earnings would go up or down according to how many hours you work?"	-
Working time mismatch	wrkhtot + wkhsch	Whether or not the respondents preferred usual working hours are aligned with usual working hours	Generated dummy variables. Please see chapter 5.3.2 for a detailed description.
Working time mismatch (in hours)	wrkhtot + wkhsch	Whether or not the respondents preferred usual working hours are aligned with usual working hours	Both underemployment and overemployment are created by taking the absolute difference in hours between actual usual working hours and preferred usual working hours
<i>Country:</i>	<i>cuntry</i>		

Denmark	cntry	Dummy variable: 1 if Denmark; 0 otherwise	-
Norway	cntry	Dummy variable: 1 if Norway; 0 otherwise	-
Sweden	cntry	Dummy variable: 1 if Sweden; 0 otherwise	-
<i>Age:</i>	<i>agea</i>	<i>Age in years</i>	<i>Generated dummy variables</i>
<25	agea	Dummy variable: 1 if <25; 0 otherwise	Respondents of age 25 and below take the value of 1
25-34	agea	Dummy variable: 1 if 25-34; 0 otherwise	Respondents of age 25-34 take the value of 1
35-49	agea	Dummy variable: 1 if 35-49; 0 otherwise	Respondents of age 35-49 take the value of 1
50+	agea	Dummy variable: 1 if 50+; 0 otherwise	Respondents of age 50 and above take the value of 1
Subjective general health	health	How is your health in general? (Scale 1 to 5, where 1 means very bad and 4 means very good)	Reversed scale
Social activity compared to age	sclact	"Compared to other people of your age, how often would you say you take part in social activities?" (Scale 1 to 5, where 1 means much less than most and 5 means much more than most)	-
Living with partner	icpart1	Dummy variable: 1 if Lives with husband/wife/partner; 0 otherwise	-
Children living at home	chldhm	Dummy variable: 1 if Children living at home; 0 otherwise	-
Belonging to a minority ethnic group	blgetmg	Dummy variable: 1 if Belong to minority ethnic group in country	-
<i>Education:</i>	<i>eisced</i>	<i>Highest level of education</i>	
Not competed high school	eisced	Dummy variable: 1 if Not competed high school; 0 otherwise	-
Completed high school	eisced	Dummy variable: 1 if Completed high school; 0 otherwise	-
Bachelor or master	eisced	Dummy variable: 1 if Bachelor or master; 0 otherwise	-
Other post education	eisced	Dummy variable: 1 if Other post education; 0 otherwise	-

Feeling about household income nowadays	hincfel	"Which of the descriptions on this card comes closest to how you feel about your household's income nowadays?" (Scale 1 to 4, where 1 means very difficult on present income and 4 means living comfortably on present income)	Reversed scale
Living in big city	domicile	Dummy variable: 1 if Living in a big city; 0 otherwise	-
Job satisfaction	stfmjob	"How satisfied are you in your main job?" (Scale 0 to 10, where 0 means extremely dissatisfied and 10 means extremely satisfied)	-
Limited or no employment contract	wrkctra	Dummy variable: 1 if limited or no employment contract; 0 otherwise	-
Self-employed	emplrel	Dummy variable: 1 if self-employed; 0 otherwise	-
Any period of unemployment and work seeking last 5 years	unemp5yr	Dummy variable: 1 if any period of unemployment and work seeking within last 5 years; 0 otherwise	-
Social trust	ppltrst	"Using this card, generally speaking, would you say that most people can be trusted or that you can't be too careful in dealing with people? Please tell me on a score of 0 to 10, where 0 means that you can't be too careful and 10 means that most people can be trusted"	-
Trust in key institutions	trstprl+trstlgl+trstplc	"Using this card, please tell me on a score of 0-10 how much you personally trust each of the institutions I read out. 0 means you do not trust an institution at all, and 10 means you have a complete trust..."	Generated variable "trust in key institutions" based on "trust in country's parliament", "trust in the legal system" and "trust in the police". Each respondent's value of the new variable is calculated as the average of the original variables.

Religious beliefs	rlgdgr	"Regardless of whether you belong to a particular religion, how religious would you say you are?" (Scale 0 to 10, where 0 means not at all religious and 10 means very religious)	-
<i>Household income:</i>	<i>hinctnta</i>	<i>Which decile the respondent's total household's income is represented by. The household's total income is defined as after tax and compulsory deductions, from all sources.</i>	
1st & 2nd decile	hinctnta	Dummy variable: 1 if 1st or 2nd decile; 0 otherwise	Generated dummy variable so that respondents who were initially in the 1st and 2nd decile are combined in one category.
3rd decile	hinctnta	Dummy variable: 1 if 3rd decile; 0 otherwise	-
4th decile	hinctnta	Dummy variable: 1 if 4th decile; 0 otherwise	-
4th decile	hinctnta	Dummy variable: 1 if 5th decile; 0 otherwise	-
5th decile	hinctnta	Dummy variable: 1 if 6th decile; 0 otherwise	-
7th decile	hinctnta	Dummy variable: 1 if 7th decile; 0 otherwise	-
8th decile	hinctnta	Dummy variable: 1 if 8th decile; 0 otherwise	-
9th decile	hinctnta	Dummy variable: 1 if 9th decile; 0 otherwise	-
10th decile	hinctnta	Dummy variable: 1 if 10th decile; 0 otherwise	-
Missing value household income	hinctnta	Dummy variable: 1 if missing value on household income variable; 0 otherwise	Generated dummy variable; respondents who have reported either "refusal", "don't know" or "no answer" in relation to question on "household income" take the value of 1

<i>Occupation:</i>	<i>iscoco</i>	<i>The respondent's occupation (Respondents are classified in accordance with the International Standard Classification of Occupations, ISCO-88)</i>	<i>Generated dummy variables in accordance with the International Standard Classification of Occupations. Note: The occupational category "Armed forced" is excluded as a dummy variable as there were no observations in this category</i>
Legislators, senior officials and managers	iscoco	Dummy variable: 1 if legislator, senior official or manager; 0 otherwise	Respondents who have a value of 1000 and above, but below 2000 take the value of 1
Professionals	iscoco	Dummy variable: 1 if professional; 0 otherwise	Respondents who have a value of 2000 and above, but below 3000 take the value of 1
Technicians and associate professionals	iscoco	Dummy variable: 1 if technician or associate professional; 0 otherwise	Respondents who have a value of 3000 and above, but below 4000 take the value of 1
Clerks	iscoco	Dummy variable: 1 if clerk; 0 otherwise	Respondents who have a value of 4000 and above, but below 5000 take the value of 1
Service workers, shop, market sales workers	iscoco	Dummy variable: 1 if service worker, shop, market or sales worker; 0 otherwise	Respondents who have a value of 5000 and above, but below 6000 take the value of 1
Skilled agricultural and fishery workers	iscoco	Dummy variable: 1 if skilled agricultural and fishery worker; 0 otherwise	Respondents who have a value of 6000 and above, but below 7000 take the value of 1
Craft and related trade workers	iscoco	Dummy variable: 1 if craft and related trade worker; 0 otherwise	Respondents who have a value of 7000 and above, but below 8000 take the value of 1
Plant and machine operators and assemblers	iscoco	Dummy variable: 1 if plant and machine operator or assembler; 0 otherwise	Respondents who have a value of 8000 and above, but below 9000 take the value of 1
Elementary occupations	iscoco	Dummy variable: 1 if elementary occupation; 0 otherwise	Respondents who have a value of 9000 and above take the value of 1
<b>Basis for split samples:</b>			
Gender	gndr	Dummy variable: 1 if male; 0 otherwise	-
Children	chldhm	Dummy variable: 1 Children living at home; 0 otherwise	-



<i>Proportion HH income</i>	<i>pphincr</i>	<i>Proportion of the household income the respondent provides</i>	<i>Generated dummy variables</i>
<50%		Dummy variable: 1 if below half; 0 otherwise	Respondents who provide "none", "very small", "about half" of the HH income take the value of 1
50%		Dummy variable: 1 if around half; 0 otherwise	Respondents who provide "about half" of the HH income take the value of 1
>50%		Dummy variable: 1 if above half; 0 otherwise	Respondents who provide "over half", "very large", "all" of the HH income take the value of 1
<i>Generation</i>	<i>agea</i>	<i>Which generation the respondent belongs to</i>	<i>Generated dummy variables</i>
Baby B		Dummy variable: 1 if Baby B; 0 otherwise	Respondents who are born in between 1945 and 1964 take the value of 1
X		Dummy variable: 1 if X; 0 otherwise	Respondents who are born in between 1965 and 1978 take the value of 1
Y		Dummy variable: 1 if Y; 0 otherwise	Respondents who are born in between 1979 and 1997 take the value of 1
<i>Degree</i>	<i>eisced</i>		<i>Generated dummy variables</i>
YES		Dummy variable: 1 if degree; 0 otherwise	-
NO		Dummy variable: 1 if no degree; 0 otherwise	-

## Appendix B. Summary Statistics of Control Variables

**Table 20.** Appendix B. Summary Statistics of Control Variables. Weighted Variable Means (Standard Deviations in parenthesis), in the European Social Survey, 2010.

	Men	Women
<b>Dependent variables</b>		
Life Satisfaction (range: 0 to 10)	8.07 (0.85)	8.09 (0.84)
Happy (range: 0 to 10)	8.06 (0.79)	8.12 (0.78)
<b>Variables of main interest</b>		
<b>Usual working hours:</b>		
<27	0.05 (0.13)	0.12 (0.19)
27-32	0.04 (0.12)	0.16 (0.22)
33-36	0.04 (0.11)	0.10 (0.18)
37-42 (reference group)	0.48 (0.29)	0.45 (0.29)
43+	0.39 (0.28)	0.17 (0.22)
<b>Usual working hours by matched/mismatched:</b>		
<37 Matched	0.07 (0.15)	
<37 Mismatched	0.06 (0.14)	
37-42 Matched	0.15 (0.21)	
37-42 Mismatched	0.33 (0.27)	
43+ Matched	0.31 (0.27)	
43+ Mismatched	0.08 (0.16)	
<27 Matched		0.06 (0.14)
<27 Mismatched		0.05 (0.13)

27-32 Matched		0.05 (0.13)
27-32 Mismatched		0.11 (0.19)
33-36 Matched		0.04 (0.11)
33-36 Mismatched		0.06 (0.14)
37-42 Matched		0.17 (0.22)
37-42 Mismatched		0.28 (0.27)
43+ Matched		0.14 (0.21)
43+ Mismatched		0.03 (0.10)

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**Control variables**

**Countries:**

Denmark	0.26 (0.25)	0.26 (0.26)
Norway	0.26 (0.25)	0.24 (0.25)
Sweden	0.49 (0.29)	0.50 (0.30)

**Age (years):**

<25 (reference group)	0.07 (0.14)	0.07 (0.15)
25-34	0.19 (0.23)	0.18 (0.23)
35-49	0.42 (0.29)	0.41 (0.29)
50 +	0.33 (0.27)	0.35 (0.28)

**Subjective general health (range: 1 to 5)**

4.19 (0.46)	4.18 (0.46)
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**Social activity compared to age (range: 1 to 5)**

2.92 (0.48)	2.93 (0.46)
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**Living with partner**

0.75 (0.25)	0.71 (0.27)
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**Children living at home**

0.50 (0.29)	0.53 (0.29)
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<b>Belonging to minority ethnic group</b>	0.04 (0.11)	0.03 (0.09)
<b>Education:</b>		
Not completed high school (reference group)	0.40 (0.28)	0.32 (0.27)
Completed high school	0.18 (0.22)	0.17 (0.22)
Bachelor or master	0.26 (0.26)	0.37 (0.29)
Other post education	0.16 (0.21)	0.14 (0.21)
<b>Feeling about household's income nowadays (range: 1 to 4)</b>	3.66 (0.34)	3.63 (0.35)
<b>Household income (decile in country):</b>		
1st & 2nd decile	0.06 (0.13)	0.07 (0.15)
3rd decile	0.06 (0.14)	0.07 (0.15)
4th decile	0.07 (0.15)	0.09 (0.17)
5th decile (reference group)	0.10 (0.18)	0.09 (0.17)
6th decile	0.12 (0.19)	0.11 (0.18)
7th decile	0.09 (0.17)	0.12 (0.19)
8th decile	0.11 (0.18)	0.11 (0.18)
9th decile	0.16 (0.21)	0.12 (0.19)
10th decile	0.20 (0.23)	0.19 (0.23)
<b>Missing value household income</b>	0.03 (0.10)	0.03 (0.11)
<b>Living in big city</b>	0.17 (0.22)	0.18 (0.23)
<b>Occupation:</b>		
Legislators, senior officials and managers	0.11 (0.19)	0.05 (0.13)
Professionals (reference group)	0.17 (0.22)	0.22 (0.25)

Technicians and associate professionals	0.21 (0.23)	0.26 (0.26)
Clerks	0.05 (0.12)	0.09 (0.17)
Service workers, shop, market sales workers	0.09 (0.17)	0.28 (0.26)
Skilled agricultural and fishery workers	0.03 (0.10)	0.01 (0.06)
Craft and related trade workers	0.18 (0.22)	0.01 (0.05)
Plant and machine operators and assemblers	0.12 (0.19)	0.03 (0.09)
Elementary occupations	0.05 (0.13)	0.06 (0.13)
<b>Job satisfaction (range: 0 to 10)</b>	7.86 (0.89)	7.87 (0.97)
<b>Limited or no employment contract</b>	0.08 (0.16)	0.12 (0.19)
<b>Any period of unemployment and work seeking last 5 years</b>	0.09 (0.17)	0.10 (0.18)
<b>Self-employed</b>	0.15 (0.21)	0.08 (0.16)
<b>Trust &amp; religious beliefs:</b>		
Social trust (range: 0 to 10)	6.60 (1.11)	6.77 (1.07)
Trust in key institutions (range: 0 to 10)	6.85 (0.99)	6.72 (0.93)
Religious beliefs (range: 0 to 10)	2.99 (1.51)	4.09 (1.62)

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**Appendix C. Remaining Control Variables for Table 10: “The associations between subjective well-being (measured by happiness and life satisfaction, both 0 to 10 scales) and usual working hours (divided into different categories) for men and women.”**

**Table 21.** *Appendix C. Remaining Control variables for Table 10*

	<b>Life Satisfaction</b>	<b>Happy</b>	<b>Life Satisfaction</b>	<b>Happy</b>
<b>Gender</b>	Men	Men	Women	Women
<b>Household income (reference group: 5th decile)</b>				
1st & 2nd decile	-0.06 (0.18)	0.05 (0.17)	-0.01 (0.18)	-0.47** (0.17)
3rd decile	0.25 (0.16)	-0.08 (0.16)	0.07 (0.17)	-0.28 (0.17)
4th decile	-0.2 (0.15)	-0.12 (0.15)	-0.02 (0.16)	-0.17 (0.16)
6th decile	-0.33* (0.13)	-0.17 (0.13)	0.25 (0.15)	-0.06 (0.15)
7th decile	-0.43** (0.14)	-0.41 (0.13)	0.00 (0.15)	-0.07 (0.15)
8th decile	-0.05 (0.14)	-0.07 (0.13)	0.04 (0.15)	-0.09 (0.15)
9th decile	-0.40** (0.13)	-0.36 (0.13)	0.02 (0.16)	-0.15 (0.15)
10th decile	-0.37** (0.13)	-0.21 (0.12)	0.01 (0.15)	-0.18 (0.14)
<b>Missing value household income</b>	-0.27 (0.21)	0.08 (0.20)	0.26 (0.22)	-0.06 (0.22)
<b>Occupation (reference group: Professionals)</b>				
Legislators, senior officials and managers	0.2 (0.12)	0.06 (0.12)	-0.10 (0.17)	-0.02 (0.17)
Technicians and associate professionals	0.19 (0.11)	0.05 (0.10)	-0.01 (0.10)	0.04 (0.10)
Clerks	0.28 (0.17)	0.17 (0.16)	0.02 (0.15)	0.01 (0.14)

Service workers, shop, market sales workers	0.09 (0.15)	0.08 (0.14)	0.03 (0.12)	-0.08 (0.12)
Skilled agricultural and fishery workers	-0.21 (0.23)	-0.46 (0.22)	-0.23 (0.35)	-0.11 (0.34)
Craft and related trade workers	0.27* (0.13)	0.04** (0.12)	-1.27*** (0.38)	-0.88* (0.37)
Plant and machine operators and assemblers	0.18 (0.14)	0.02 (0.13)	0.17 (0.23)	0.03 (0.22)
Elementary occupations	0.65*** (0.18)	0.38* (0.17)	0.06 (0.18)	0.23 (0.18)

**Appendix D. Remaining Control Variables for Table 11: “The associations between subjective well-being (measured by happiness and life satisfaction, both 0 to 10 scales) and usual working hours by match/mismatch for men and women.”**

**Table 22. Appendix D. Remaining Control Variables for Table 11**

	Life Satisfaction		Life Satisfaction	
	Happy	Happy	Happy	Happy
Gender	Men	Men	Women	Women
<b>Household income (reference group: 5th decile)</b>				
1st & 2nd decile	-0.08 (0.18)	0.05 (0.17)	-0.02 (0.18)	-0.51** (0.17)
3rd decile	0.24 (0.16)	-0.09 (0.16)	0.09 (0.17)	-0.25 (0.17)
4th decile	-0.16 (0.15)	-0.09 (0.15)	-0.02 (0.16)	-0.17 (0.16)
6th decile	-0.33* (0.13)	-0.17* (0.13)	0.24 (0.15)	-0.06 (0.15)
7th decile	-0.45** (0.14)	-0.39** (0.14)	0.00 (0.15)	-0.04 (0.15)
8th decile	-0.05 (0.14)	-0.07 (0.13)	0.02 (0.16)	-0.09 (0.15)
9th decile	-0.37** (0.13)	-0.35** (0.13)	0.01 (0.16)	-0.14 (0.15)
10th decile	-0.37** (0.13)	-0.2** (0.13)	0.02 (0.15)	-0.15 (0.14)

<b>Missing value household income</b>	-0.19 (0.22)	0.04 (0.21)	0.26 (0.22)	-0.06 (0.22)
<b>Occupation (reference group: Professionals)</b>				
Legislators, senior officials and managers	0.14 (0.13)	0.03 (0.12)	-0.11 (0.17)	-0.02 (0.17)
Technicians and associate professionals	0.14 (0.11)	0.05 (0.10)	-0.03 (0.10)	0.03 (0.10)
Clerks	0.23 (0.17)	0.16 (0.17)	0.01 (0.15)	0.04 (0.14)
Service workers, shop, market sales workers	0.05 (0.15)	0.06 (0.14)	0.02 (0.13)	-0.07 (0.12)
Skilled agricultural and fishery workers	-0.24 (0.23)	-0.48 (0.22)	-0.11 (0.36)	-0.1 (0.35)
Craft and related trade workers	0.21 (0.13)	0.05 (0.13)	-1.30*** (0.38)	-0.89* (0.37)
Plant and machine operators and assemblers	0.13 (0.14)	0.05 (0.13)	0.16 (0.23)	0.05 (0.22)
Elementary occupations	0.55** (0.18)	0.35** (0.18)	0.00 (0.18)	0.25 (0.18)