Quantitative Analysis of Well-being with economic Applications

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2.1 Introduction
This chapter introduces the concept of subjective measures and its main assumptions. These questions and assumptions will be used throughout this thesis. Section 2.2 introduces the main subjective questions that are being used to measure welfare and well-being. Section 2.3 briefly discusses the two main assumptions underlying the use of subjective questions: namely, that individuals are able to evaluate their own situation, i.e. utility can be measured; and that responses among individuals are comparable. Section 2.4 reviews findings on the determinants of welfare and well-being, which offer insight into the structure of welfare and well-being. This last section gives a picture of the state of the art. This gives both a starting point for the new insights presented in this thesis and a reference point to judge whether the results found in this thesis are theoretically and intuitively plausible. Section 2.5 concludes.

2.2 Important subjective questions for measuring welfare and well-being
With subjective questions on well-being, individuals are asked about their life satisfaction in general or with respect to various domains of life, such as job, housing, or health. Subjective questions on welfare ask respondents to evaluate their actual income, any hypothetical income, or their general financial situation. Responses to questions on satisfaction with life in general are often referred to as Subjective Well-Being (SWB) or General Satisfaction (GS). Responses to subjective questions about satisfaction with the concrete domains of life are referred to as Domain Satisfactions (DS), the main ones in the economic literature being Financial Satisfaction (FS), Job Satisfaction (JS), and Health Satisfaction (HS).

A relevant characteristic of the subjective measures is that they take into account individual perceptions. This has the implication that SWB can remain constant over time even
when there is a change in the individual situation, as measured by objective variables such as income.

This dichotomy can be explained by the adaptation of individuals to a new situation through a change in their aspirations. Another possible explanation is that individual subjective well-being and welfare are relative concepts that should be seen in a social context. For instance, individual welfare does not necessarily improve with a higher income, if the income of individuals in the same reference group increases as well.


The remainder of this section presents a review of the subjective questions that are most relevant for economic studies. The ‘Cantril question’ is one of the most well-known questions on individual well-being. This question developed by Cantril in 1965 and variations of it, such as the Likert-Scale (Likert, 1932), have been widely applied for various countries. The World Database of Happiness by Veenhoven (1995) presents an overview of questionnaires that include this type of subjective question on life satisfaction, well-being, and happiness. Such questions are usually termed ‘subjective well-being questions’. The original Cantril question is as follows:
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Here is a picture of a ladder, representing the ladder of life. Suppose we say the top of the ladder (step 10) represents the best possible life for you, and the bottom (step 0) represents the worst possible life for you. Where on the ladder do you feel you personally stand at the present time?

Please mark the appropriate step.

**Figure 2.1 The Cantril question**

An answer to this or any similar subjective well-being question represents an individual's Subjective Well-Being (SWB) or General Satisfaction (GS). In some questionnaires, respondents are also asked about where on the ladder they were 5 years before and where they expect to be after 5 years. The latter questions are relevant for testing the importance of "adaptation theory" (see Section 2.3.2). In addition, respondents are sometimes asked where on the ladder they would put their own country as a whole. This question is relevant for assessing the importance of an individual's perceived relative well-being position in society (see Section 2.3.2). In some surveys, the SWB question is asked twice, i.e. at the beginning and at the end of the questionnaire. This allows the researcher to see the effect on the responses of the individual after he/she has gone through the whole questionnaire, which makes the respondent possibly more conscious about his/her own situation. Similarly, the SWB question can be asked before or after asking about specific domain satisfactions. If the SWB question is asked after a specific Domain Satisfaction (DS) question, the correlation with SWB and this DS is probably higher than if the SWB question is asked first. For example, Strack et al. (1960) found a higher correlation between the question: 'How many dates did you have last month?' and 'How happy are you?' when the dates-question was asked first.

Asking about well-being or GS often involves posing questions about individual satisfaction with respect to some domains of life, such as employment, financial situation, health, housing, leisure, marriage, and environment. These questions have the following structure:

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3 For illustration, the question from the German Socio-Economic Panel (GSOEP) (Wagner et al., 1993) is used.
How satisfied are you with the (financial) situation of your family?

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Figure 2.2 The Subjective Financial Satisfaction question, GSOEP

The answers to this question illustrate individuals’ own evaluation of a concrete DS, in this case their financial situation. Like the SWB question, the DS questions have been empirically examined with econometric techniques. Generally, it is assumed that DS depend on objective variables. The Financial Satisfaction (FS) question is considered as a measure of welfare and, like other DS questions, it is a component of individuals’ well-being. Some economists have used a Health Satisfaction (HS) question in evaluation and QALY (Quality of Adjusted Life Years) studies (see, e.g., Chapters 5 and 8 of this thesis; Cutler and Richardson, 1997; Groot, 2000; Kerkhofs and Lindeboom, 1995). Other economists have used the Job Satisfaction (JS) question or the SWB question to study individuals’ behavior on the job market (see, e.g., Clark and Oswald, 1994; Clark, 1997, 1999, 2000; Clark et al., 1996; Clark et al., 2001; Drakopoulos and Theodossiou, 1997; Groot and Maassen van den Brink, 1999; Sousa-Poza and Sousa-Poza, 2000; Wottiez and Theeuwes, 1998). A full model of the structure of individual well-being is presented in Chapter 3.

2.3 Core assumptions underlying the analysis of subjective questions

2.3.1 People can evaluate their own situation

Most economists are skeptical about subjective and hypothetical questions. They have instead focused on observed behavior in market situations (i.e. revealed preferences), in controlled settings (i.e. experimental economics), or in questionnaires (contingent valuation studies on willingness to pay). Revealed preferences studies include the valuation of nonmarket goods, such as noise and pollution, through house prices (Smith and Huang, 1995), and the evaluation of risk attitudes through the examination of job or insurance markets (Viscusi, 1993). Nevertheless, some studies on individual behavior and preferences have been based on subjective or hypothetical questions. Examples are questionnaires in which respondents are
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asked about risk attitudes and hypothetical lotteries (see, e.g., Donkers and van Soest, 1999; Hartog et al., 2000).

Currently, most economists regard utility as a theoretical concept to explain and predict economic behavior. Indeed, the use of the notion of utility has slowly shifted from representing ‘satisfaction’ or ‘welfare level’ to expressing individual preferences. Kahnemann et al. (1997) argue that there are two meanings of utility: experienced utility and decision utility. Experienced utility, which has its origins in the writings of Bentham (1789), understands utility as a measure of pleasures and pains. Decision utility represents individuals choices and can be deduced from them. Gibbard (1996) argues that emphasizing preference as the fundamental element of utility implies that welfare is defined as the extent to which preferences can be satisfied. In this context, revealed preferences indicate welfare. Focusing attention on observed behavior ignores the fact that individual behavior is driven not only by the achievement of higher levels of utility or well-being but also by feelings of revenge and jealousy, imitation of others, social norms and institutions, and legal prohibitions (Gibbard, 1996). This means, for instance, that certain preferences will never be revealed. For example, an individual who has a desire to consume drugs may not reveal this because of legal repercussions or social norms. Therefore, studying individual welfare by only looking at market behavior will not enable one to capture the positive impact that consuming illegal drugs would have on this individual’s welfare. In other words, revealed preferences are an incomplete image of the set of individual preferences.

Non-economists should note that utility in modern economics is a subjective concept. Utility, to the surprise of most language students, does not express ‘value’ or ‘usefulness’ but ‘desiredness’ and ‘satisfaction’. In Black’s words: “Utility in the sense of desiredness is a purely subjective concept, clearly distinct from usefulness or fitness for a purpose…” (1987, p.295). Hence, given that utility is a subjective concept, one would tend to think that subjective questions could best capture and measure it. Similarly, Diener et al. (1997), psychologists working on happiness and well-being, argue that individuals themselves are the ones who can best judge their own situation regarding well-being, and therefore subjective questions seem to be most suitable for this purpose.

Psychologists studying well-being have compared different measures of SWB and found that these are often mutually consistent: for example, self-reported SWB correlated with the
amount of smiling (Sandvik et al., 1993) and other physiological measures, such as changes in facial muscles (see Kahneman, 1999). Nevertheless, such findings are not always conclusive, and the development and comparison of alternative measures of SWB are being studied by many psychologists so as to develop better instruments for measuring it (Diener and Biswas-Diener, 2000).

For more than three decades, psychologists, sociologists, and economists have used a range of statistical-econometric techniques to analyze answers to subjective questions on welfare and well-being. They have found that, in general, these provide consistent results, which moreover agree with our common sense (see Section 2.4). This indicates that individuals understand and are able to answer subjective questions.

Satisfaction questions do, however, suffer from a number of shortcomings. First, self-reported measures of welfare and well-being relate to remembered utility, which does not correspond perfectly with experienced utility (see Kahnemann et al., 1997 and Kahneman, 1999). In particular, when evaluating retrospectively the total utility of an event (remembered utility), individuals give a relatively higher weight to events with a high intensity (Peak Effect) and those that have occurred last (End Effect), known as the Peak-End evaluation rule. Therefore, subjective well-being correlates strongly with peak and end events. For example, self-reported well-being in a given year based on one interview is much influenced by extreme events, such as a divorce or becoming unemployed. Kahneman (1999) argues that an ideal measure of happiness would consist of the aggregation of "... a dense record of the quality of experience at each point-instant utility..." (p.3). Nevertheless, this ideal measure can never be constructed. Moreover, remembered utility is what shapes individual behavior. Therefore, subjective measures can be used to predict individual choices and behavior (Kahnemann et al., 1997).

Second, when using self-reported measures of welfare and well-being, one has to be aware of the adaptation phenomena. It is now well known that individuals adapt to new situations, such as an income increase or becoming handicapped, by changing their expectations. Therefore, the long-run impact on well-being of a change in the objective situation of an individual is smaller than one would have estimated a priori or at the instant moment of change (see Brickman and Campbell, 1971; Frederick and Loewenstein, 1999; Helson, 1947; Kahneman, 1999). For example, continuously improving one’s financial situation does not
necessarily lead to a higher level of happiness (see Section 2.3). In health economics, the impact of an illness on the Quality of Life is often assessed by asking healthy individuals to evaluate a hypothetical situation in which they suffer a certain illness. Because of the presence of adaptation, asking healthy individuals will overestimate the true long-term reduction in well-being. Chapter 8 in this thesis evaluates the well-being impact of various illnesses by considering only individuals who actually suffer from the illness.

Third, the interpretation of the well-being scale changes with the objective situation (Kahneman, 1999). For example, if the income of an individual changes, so will her evaluation of what constitutes a good and a bad life. This is what Kahneman (1999) calls the 'satisfaction treadmill', which can be related to aspirations or to adaptation (Kahneman, 1999). An empirical example is offered by studies using the Income Evaluation Question (IEQ), which demonstrates that what an individual considers a good income depends largely on her actual income (see, e.g., van Praag, 1971; Van Praag and Frijters, 1999; Van Praag and Kapteyn, 1973).

2.3.2 Interpersonal comparisons are possible
A meaningful analysis of subjective questions of welfare and well-being requires that individuals' responses are mutually comparable. In other words, it is assumed that individuals understand and respond to subjective questions in similar ways. Indeed, findings indicate that, at any rate within the same language community, individuals have a very similar understanding of concepts such as welfare, well-being, and happiness. Van Praag (1991) has found evidence that individuals belonging to the same language community translate verbal labels in a context-free framework into similar numerical values. More specifically, not only are the meanings of "good" and "bad" the same for all respondents, but also the equivalence between these verbal labels and a numerical scale (e.g. 0 to 10) is judged in a similar way by respondents.

Most economists, however, have resisted the comparison of individual feelings, perceptions, welfare, utility, and well-being. Actually, the use of the utility concept for normative purposes has been practically ruled out by the economic literature, on the assumption that individual utilities or welfare are incomparable.
The utility concept was first introduced by Jeremy Bentham (1789) as an instrument for predicting behavior and for normative analysis, such as interpersonal comparison. In the early studies, interpersonal comparability was not considered impossible even though it was understood to be difficult (Black, 1987). Important economists of the late 19th century, such as Marshall, Menger, and Walras, were receptive to the possibility of interpersonal (or inter-group) comparison of utility or welfare (Black, 1987). Bentham and Walras spoke about total utility and maximum of utility, respectively (Black, 1987; Sen, 1999). At the beginning of the 20th century, Pigou (1920) defended the use of income as a proxy to compare welfare among individuals. Later on, starting in the 1930s with Lionel Robbins, most economists started to question the measurement of utility. Together with the establishment of the difference between cardinal and ordinal utility and the domination of the Pareto-efficiency concept, the impossibility of interpersonal comparisons became a widespread belief (Gibbard, 1996; Hammond, 1996; Scitovsky, 1951; Sen, 1995, 1999). Robbins (1932, 1938), who can be considered the father of the New Welfare Economics, argued that interpersonal comparability was a normative concept that should not be brought into economics. Like most economists of that time, Robbins was profoundly influenced by the philosophy of logical positivism that even now still dominates in economics.

A decade later, Arrow’s (1950, 1951) famous Impossibility Theorem put welfare economics in disarray, as it showed that the construction of a Social Welfare Function is impossible in the absence of interpersonal comparisons of individual welfare. Arrow (1950) reflects the opinion of the followers of the New Welfare Economics, when stating that: “It will continue to be maintained that there is no meaningful interpersonal comparison of utilities…” (p.343). Many economists have responded to Arrow’s approach by relaxing this assumption. With ordinal interpersonal comparisons, unique social welfare orderings can be derived, i.e. the construction of a Social Welfare Function becomes possible (see Sen, 1999). Furthermore, it has been shown that interpersonal comparability of individual welfare and well-being can be derived from empirical work, either by comparing objective indicators of individuals’ material achievements (e.g. Atkinson and Burgounion, 1982; Jorgenson, 1990; Pollak and Walles, 1979) or by comparing subjective indicators, such as those derived from SWB questions. Thus, one has to ask what is to be compared (Sen, 1999): material achievements, such as income, or subjective mental states, such as well-being? This chapter
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does not enter into issues regarding methods for interpersonal comparison, definitions of equality, or discussions on welfare economics. For an outstanding exposition on social choice and interpersonal comparisons, see the Nobel Prize lecture given by Sen (Sen, 1999).

Cardinal or Ordinal comparisons?
Many economists have argued in favor of different degrees of interpersonal comparison, so as to allow social welfare judgments of socially relevant issues, such as poverty and inequality (e.g., Hammond, 1996; Harsanyi, 1987; Ng, 1996, 1997; Sen, 1999 and Tinbergen, 1991). In fact, many policies that redistribute income use interpersonal comparisons based on income as a unit of comparison. In other words, distribution policy as performed in most countries regards income as a proxy variable for welfare or utility and assumes that welfare can be compared among individuals on the basis of income. According to Hammond (1996), the main exception to the reluctance to make interpersonal comparison has been the "... almost certainly unethical comparisons that result from weighting all individuals' dollars equally" (p. 411). Scitovsky (1951) argues that policy recommendations always imply some degree of interpersonal comparison. Actually, to avoid interpersonal comparisons, policy decisions would need to be strictly based on the Pareto-criterion. Furthermore, in everyday situations individuals always make interpersonal comparisons when deciding, for example, to whom they will give a present -for instance, a spare ticket for a soccer game (Harsanyi, 1987; Simon, 1974; Hammond, 1996).

The answers to subjective questions, both SWB and DS, are qualitative and take discrete values ranging from, for example, 0 to 10. The answers to SWB questions have been econometrically estimated, so as to find the relationship between individual well-being and objective variables, such as income and employment status. Depending on whether the researcher is willing to assume cardinality or only ordinality, the answers to SWB questions have been estimated by means of Ordinary Least Squares or (Ordered) Probit and Logit techniques. In a recent paper, Ferrer-i-Carbonell and Frijters (2002) showed that whether cardinality or ordinality is assumed does not affect the results significantly, in the sense that all coefficients change in the same direction and order of magnitude. The thesis uses the less restrictive assumption of ordinality when possible and assumes cardinality if necessary.
Furthermore, various researchers make use of panel data, in which case, regression analysis or Ordered Probit or Logit techniques with individual effects are used. The three data sets used in this thesis have a panel character and this always introduces the possibility of individual and time effects. Individual effects are those unobservable characteristics that change across people but remain constant across time. For example, individual personal traits such as optimism. Time effects are those unobservable characteristics that are common for all individuals but change across the years, e.g. inflation or political instability.

2.4 Determinants of welfare and well-being

This section presents a selection of empirical findings in the literature that use subjective questions of welfare and well-being. The objective of this is twofold. First, the comparison of the results obtained in several studies allows us to disentangle the determinants of welfare and well-being. This in turn offers a first approximation of the structure of individual welfare and well-being. Second, the empirical findings in the literature of subjective welfare and well-being can be used to examine the consistency, across time and countries, of the answers to subjective questions. Consistency among studies would provide support for the significance and reliability of the method that uses subjective questions to measure welfare and well-being. In other words, consistency would represent an empirical validation of the meaningfulness of the answers to subjective questions. Similarly, results should be consistent with findings in other disciplines, as well as with our common sense. For example, the correlation found between subjective questions on health (self-reported health) and objective variables, such as ‘mortality’ or ‘absence of work for illness’ (Idler and Kasl, 1995), suggests that, generally, individuals are able to evaluate, understand, and ‘correctly’ report their health situation.

The literature on the determinants of subjective well-being (SWB) is very large and provides many interesting insights. Here, special attention is drawn to income and employment variables. In addition, variables such as health, having children and noise are discussed. The determinants of well-being can be divided into two groups: namely, objective variables (e.g. income and age) and subjective variables (e.g. financial satisfaction and self-reported health). The objective variables are called external factors of SWB, while the subjective variables are related to internal factors (Diener and Lucas, 1999). Clearly, objective variables do not fully explain individual SWB, especially since the importance of
personality on determining individual well-being and happiness can not be ignored. Objective socio-economic and demographic variables explain somewhere between 8% and 20% of an individual’s subjective well-being (see Kahneman et al., 1999). This finding has led to a slow shift in the psychology literature from studying external factors to focusing on internal factors. For economists, however, external factors, such as income or employment, are still very important. In other words, not only are the SWB levels and changes relevant but also the ‘resources’ and the ‘objective environment’ that partly determines SWB.

SWB and income
The relationship between income and SWB has been one of the most discussed topics in the SWB literature. The main and most controversial issue has been the role of income in individual well-being. The authors studying the relationship between income and well-being using data on one country, find mixed evidence. While some authors find a positive, although small, correlation between income and SWB (see, e.g., Blanchflower and Oswald, 2000, for the USA; Ferrer-i-Carbonell and Frijters, 2002, for Germany; Frey and Stutzer, 2000a, for Switzerland; Frijters et al., 2002, for Germany; Gerdtham and Johannesson, 2001, for Sweden; and McBride, 2001, for the USA) others find a negative relation (see, e.g., Clark 2000, for England), or a non-significant one (see, e.g., Clark and Oswald, 1994). This leads to the conclusion that income correlates weakly with SWB. Furthermore, it was argued that in poor countries, or among poor people in richer countries, the correlation between income and life satisfaction was higher than that for richer countries or people. This suggests that increases of income considerably enhance well-being until a certain threshold level, after which further increases of income do not improve individual well-being substantially. More recent research based on larger data sets supports this conclusion (Argyle, 1999; Diener et al., 1993).

Nevertheless, these results should not be interpreted to mean that income is totally irrelevant for well-being beyond certain income levels. Income allows people, in modern societies, to enjoy, for example, expensive leisure activities. This statement could be interpreted as being in contradiction with the aforementioned empirical findings. However, the following points should be borne in mind.
First, more important than income in absolute terms ('absolute income') is the subjective perception of income ('subjective income'). In other words, general satisfaction with life (i.e., SWB) depends on whether individuals perceive their income as adequate to satisfy their needs, where these needs include not only food and shelter but also higher needs such as social acceptance or self-esteem (see Maslow, 1970). This argument is empirically sustained by the higher correlation found between SWB and 'subjective income' than between SWB and 'absolute income'. For example, Schyns (2000) found for the Russian Federation that 'income satisfaction' was more highly correlated with SWB than with 'absolute income'. Similarly, Financial Satisfaction (FS) usually has the highest coefficient when regressing SWB on various DS (e.g. van Praag et al., 2000). This indicates that satisfaction with one's own financial situation is an essential part of SWB.

Second, one's own income compared with (or relative to) the income of other people has an influence on SWB. This reflects the fact that satisfaction with one's own income depends on the relative position of the individual in the society. According to Easterlin (1995, p.36): "... happiness, or subjective well-being, varies directly with one's own income and inversely with the incomes of others". The idea that individuals compare their income with that of other people is clearly consistent with the social comparison models and the discrepancy theories in psychology (see, e.g., Michalos, 1985). In Russia, for example, the variable defined as 'my financial situation is much less than average,..., much more than average' showed a much higher correlation with SWB than the family income itself. An important question in this context is: What is the reference group of an individual (van der Sar et al., 1988)? Does it include people from the same neighborhood or with the same level of education? There has been some theoretical and empirical work on the importance of reference groups for individual welfare and well-being (see, e.g., Chapter 4 of this thesis; Falk and Knell, 2000; McBride, 2001; van de Stadt et al., 1985; Woittiez and Kapteyn, 1998). Chapter 4 of this thesis presents an empirical analysis on the importance of the comparison income effect by extending the previous work.

Third, individual income perception depends on one's own situation in the past. Easterlin (1995) calls this 'habit formation': changes in income are more important determinants of individuals' satisfaction with life than 'absolute income'. Nevertheless, individuals seem to
adapt to increases of income by changing their aspirations. This suggests that increases of income will increase satisfaction only temporarily. An example supporting this view is a study of lottery winners who report higher levels of satisfaction only for a short time after winning a lottery (Brickman et al., 1978). Similarly, Schyns (1999, 2000) found a small coefficient for the effect of changes in income on life satisfaction in Germany and the Russian Federation. In an extensive literature review, Diener and Biswas-Diener (1999) conclude that changes in income -contrary to aspirations- do not influence SWB, while average income does. A relevant question for economists is whether the adaptation phenomenon only relates to an income increase or also to a reduction. Frey and Stutzer (1999) found for Switzerland that increases in income with respect to the previous year had a very small effect on general satisfaction with life (SWB), while reductions in income had a significantly negative impact on the SWB. Adaptation theory, therefore, needs to be treated with some caution as the evidence is contradictory (see also Frederick and Loewenstein, 1999; Diener et al., 1997). The income adaptation evidence led Easterlin (2000) to draw a distinction between long-term and short-term utility. According to Easterlin, as income increases, aspirations change. In particular, increases of income shift the short-term utility curve to the right, giving rise to an almost ‘flat’ long-term utility. Earlier, van Praag (1971) had already found this result, which he refers to as preference drift.

The previous insights are relevant to the discussion of income growth and progress. The influence of income perceptions on SWB, taking into account relative income and adaptation to income increases, leads to the conclusion that equally-distributed income growth does not necessarily improve individual SWB. Diener et al. (1999) and Oswald (1997) present some evidence of this for the USA and various European countries since the 1970s. Similar evidence has been found for Japan between 1958 and 1987 (Veenhoven, 1993). Nevertheless, this does not imply that income is unimportant for individual well-being. Moreover, while there is some evidence that economic growth does not increase SWB in the western countries, the opposite is not necessarily true, i.e. decreases in income might decrease individual SWB.

A more original answer to why increases in income in Western countries have not led to higher levels of SWB is given by Phelps (2001), who argues that the reason why SWB has not

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4 The results of these regressions are available from the author.
increased in the USA is due to the decrease in the percentage of altruistic people in the population.

**SWB and employment**

Having a job is positively correlated with subjective well-being, and being unemployed negatively (Clark and Oswald, 1994; Frey and Stutzer, 1999; Frijters et al., 2002; Gerdtham and Johannesson, 2001; Korpi, 1997; Oswald, 1997; Winkelmann and Winkelmann, 1998; Woittiez and Theeuwes, 1998). Clark and Oswald (1994) found ‘unemployment’ to be the most relevant variable for mental distress, with higher coefficients than variables such as being divorced or a widower. This is consistent with suicide statistics, which indicate that being unemployed is the main cause of emotional distress (Oswald, 1997). Similarly, other studies have detected a high correlation between subjectively evaluated Job Satisfaction (a DS) and SWB (see a meta-analysis study by Tait et al., 1989). Clearly, it is not the same to be dissatisfied with one’s job as it is to be unemployed.

Unemployment has two impacts: first, it adversely affects the financial stability of the individual; and, secondly, it is a source of emotional instability and reduction of self-esteem. Several studies have found that the ‘non-pecuniary’ costs of being unemployed are more important than the economic costs (see, for example, Oswald, 1997, for the UK; Winkelmann and Winkelmann, 1998, for Germany; Frey and Stutzer, 1999, for Switzerland). This result suggests that economic policies aimed at reducing unemployment are more relevant for increasing SWB than welfare policies that focus on compensating unemployed individuals for a loss of income. Clark and Oswald (1994) and Clark (2000), however, find that the negative effects of being unemployed vary across groups, being lowest for the young people, individuals living in areas with a high unemployment rate, and people who have been unemployed for a long time.

**SWB and other economic, social, and demographic variables**

Next, several other variables relevant for SWB are discussed. While in early studies it was argued that increases in age reduced happiness, recent findings suggest that this is not a universal truth. Many studies find a negative correlation between age and SWB only until the middle of life (the 30s and 40s), after which point satisfaction increases with age. This is the
well-known ‘age U-shaped relationship’ (see, e.g., Clark and Oswald, 1994; Gerdtham and Johannesson, 2001; van Praag et al., 2000). Much of the evidence is based on either cross-sectional analysis or longitudinal studies. Since these do not correct for a generational effect, age and cohort effects cannot be separated.

Gender differences are usually very small. Women are, in general, more frequently depressed and experience more negative emotions than men but are not consistently unhappier. Diener et al. (1999) explain this by suggesting that, even if women experience negative emotions more often, they also experience more positive emotions, so that these balance out. The empirical evidence using SWB questions seems contradictory. Some studies find women to be happier (see, e.g., Gerdtham and Johannesson, 2001) and others men (see, e.g., Clark and Oswald, 1994; Theodossiou, 1998), but the difference tends to be small. Van Praag et al. (2000) find for Germany that women are, in general, more satisfied except with regard to leisure satisfaction.

Having a partner or being married contributes positively to life satisfaction (see, e.g., Argyle, 1999; Blanchflower and Oswald, 2000; Clark and Oswald, 1994; Lee et al., 1991; Oswald, 1997). Love, partnership, and marriage have been found to be positively and highly correlated with subjective well-being, as well as with one’s health (Myres, 1999). It is not clear, however, which influence dominates: whether having a partner increases individual well-being, or whether being happy increases the probability of getting and maintaining a partner (Diener et al., 1997). Surprisingly, perhaps, the number of children is, in general, found to have a negative, although small, impact on life satisfaction (Argyle, 1999; Clark and Oswald, 1994; Frey and Stutzer, 1999; van Praag et al., 2000).

Health correlates highly with SWB (see, e.g., Chapter 8 of this thesis; Clark and Oswald, 1994; McBride, 2001; and Chapter 3 of this thesis). This correlation is generally lower when health is measured by objective variables instead of by subjective or self-reported variables (Argyle, 1999). This reflects the importance of personality, which influences the subjective evaluation of one’s own health situation (Diener and Lucas, 1999; Diener et al., 1999).

Some other characteristics of individuals correlate with SWB. Religion correlates positively with SWB (see, e.g., Ellison, 1991). The effect of education on SWB is ambiguous. Sometimes it is found to be positive (see, e.g., Frey and Stutzer, 2000; Gerdtham and Johannesson, 2001; van Praag et al., 2000) and other times negative (see, e.g., Clark and
Oswald, 1994). Moreover, it is difficult to disentangle whether the correlation is due to a pure education effect or due to other factors that are correlated with higher education, such as having a higher 'social status' and having an 'exciting job' (Diener et al., 1999). The relationship between inflation and SWB is found to be negative (see, e.g., Di Tella et al., 1999). Finally, direct democracy, i.e. the possibility to participate in a referendum, is found to correlate positively with SWB in a study for Switzerland (Frey and Stutzer, 2000a).

2.5 Conclusions
This chapter has provided arguments in favor of the use of subjective measures as a proxy to measure individuals' welfare and well-being. Subjective measures are based on respondents' answers to questions about the evaluation of their own life satisfaction or of satisfaction with domains of life, such as their financial situation, employment, and health. For a meaningful analysis of these subjective questions, one needs to assume that individuals are able to evaluate their own situation, and that responses among individuals are comparable. The first assumption is supported by the consistency found among the empirical studies on SWB questions. The second assumption, with a long history in economics, is more controversial. Several economists have defended the possibility and the need to compare individuals on the basis of some objective welfare indicator.

The empirical analysis of SWB indicates that satisfaction with income is relevant for individual well-being. Satisfaction with income is, however, not fully proportional to income. Concretely, satisfaction with income is influenced by an individual's income development over time, as well as by his or her relative position in society, i.e. relative welfare. Employment status is one of the main causes of well-being. Unemployment not only has economic consequences but is also a cause of emotional distress. In empirical studies, the non-monetary consequences of unemployment have been found to greatly influence individual well-being. Similarly, variables such as health, age, living with a partner, education, and inflation have been found to influence of welfare and well-being. Needless to say, personality traits and unobservable variables explain a major part of individual welfare and well-being. Nevertheless, these variables are either outside the control of policymakers or unknown, and thus of less interest for economists.
As extensively discussed in Chapter 1, SWB questions are important to economists and behavioral scientists for various reasons. First, they can be used to examine the structure of individuals' welfare and well-being and thus assist in understanding individuals' preferences and in predicting behavior. Second, SWB questions allow the evaluation of many socioeconomic policies. Similarly, relevant aspects, such as unemployment, can be evaluated by their effect on individual well-being. Third, measuring welfare and well-being contributes to the assessment of distributional problems, as well as to the understanding of who is, or is not, relatively well-off, and why. Fourth, understanding the structure of welfare and well-being sheds light on the potential trade-off between variables such as income, health and number of children.