EVER RISING EXPECTATIONS: THE DETERMINANTS OF SUBJECTIVE WELFARE IN CROATIA

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Abstract

The focus of this paper is the subjective welfare of the individual in the case of Croatia, a country that in the 1990s carried out a transformation from a socialist to a market-based economy while being at war as a result of the break-up of the former Yugoslavia. Subjective welfare is commonly found to be different from welfare as measured by objective criteria such as income. This difference is first explored by profiling poverty based on the two measures, and here the largest difference is found among those who are not objectively poor. Further the determinants of subjective welfare are analyzed in an ordered probit model broadly grouped as objective variables of personal or household circumstances, and measures of relative income, individual income compared with different reference groups. The results show that, apart from absolute income, which leaves large room for other explanations, relative income is the strongest determinant. This can be connected to the transition heritage of Croatia and is also in line with what has been found in other countries.

Keywords: Croatia, financial satisfaction, ordered probit model, poverty, subjective welfare

1 Introduction

The challenge of defining and measuring the welfare of the individual and society has been and remains a highly debated issue within the field of economics. Also contro-

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versial is the normative issue of defining a lowest acceptable level of welfare. One of the few generally accepted definitions of an acceptable level of welfare is an individual's or household's capacity to live above a certain poverty line measured by income or expenditure. This is based on the assumption that the welfare of the individual can be measured in terms of utility defined by consumption choices made depending upon disposable income. This paper disputes the focus on monetary aspects in welfare and poverty analysis and instead turns to the subjective welfare of the individual.

While the subjective welfare of the individual is extensively covered in developed countries, empirical studies in transition countries are more scarce but of particular interest for subjective welfare analysis. These countries' rapidly and profoundly changing economic, political, and social environments have affected the way people view both their own situation and that of others, hence empirical evidence from these countries can provide important insights for welfare analysis and both national and international welfare policies.

The country in the focus of this study, Croatia, has carried out extensive reforms since the beginning of the 1990s. The economic and social strain of the transition process was worsened by the fact that Croatia was in a state of war as a consequence of the break-up of the former Yugoslavia. The war begun just a few years after the transition had been initiated and as the Croatian borders were not fully defined until 1998 a large part of the reforms was carried out in the shadow of war. These circumstances provide a very special setting for subjective welfare analysis. Further more, the very rich data set of the "Quality of Life in Croatia" survey provides promising ground for closely assessing subjective welfare. Finally, as a consequence of the challenging development of the 1990s a comparatively large part of the Croatian population is considered poor and apart from the general interest in analyzing what the determinants of subjective welfare are, the particular characteristics of the part of the population living in poverty are of importance and interest.

When defining poverty, the general view is that it is first and foremost a monetary issue. Poverty has exclusively been seen as a lack of income or consumption possibilities, for the poorest members of the population or in the least developed countries. But the multidimensionality of poverty and the concept of social exclusion are becoming increasingly important in anti-poverty policies both within countries and among international organizations.[2] This can be seen in more encompassing poverty measures such as the Human Development Index (HDI) which includes life expectancy, education, and living standard in terms of GDP per capita. As this kind of measure becomes more important it is crucial to conduct further research into what the true determinants of welfare are, in order to provide basis for the choice of variables to be included. This confirms the need for further exploration of how different dimensions of poverty and social exclusion affect subjective welfare.

Monetary measures such as consumption, which are accepted proxies for welfare, have in empirical studies been proven to be significantly different from the level of subjective welfare, even if the question determining subjective welfare is focused solely on economic welfare. Therefore the purpose of this paper is to investigate this difference, if any, in the case of Croatia. First, the part of the population living in poverty will be furt-

[2] Social Exclusion is defined by the UNDP Croatia as deprivation in three fields; income, employment and socio-cultural engagement (absence of social participation or tertiary sociability). See UNDP. 2006a:21.

her examined to provide a background for the analysis of the determinants of subjective welfare. The characteristics of this group will be analyzed in terms of both subjective and objective (or income) poverty. Second, the focus will be on the determinants of subjective welfare. The correlation of income and subjective welfare will be investigated to provide the basis for an ordered probit model analysing the influence of individual characteristics and circumstances on the level of subjective welfare.

The paper is structured as follows: after a brief note on the socio-economic context of Croatia, the second section covers the general literature and previous studies on subjective welfare. Section 3 describes the dataset used in this study and provides the descriptive statistics which is extended into a multivariate model in section 4. Section 5 concludes.

1.1 Socio-Economic Context

Some points beyond the scope of the Quality of Life survey are worth mentioning, as several country level variables have been shown to affect subjective welfare. These are not likely to affect different individuals in a systematically different way and hence carry few implications for the analysis of the determinants of subjective welfare (SW) but will provide important insights for further conclusions.

Croatia has since the early 1990s carried out extensive reforms in order to establish a market economy. Notable is that the previous socialist economy of the former Yugoslavia was never a full planned economy and was well integrated in global trade, which smoothed the transition. Still, it was a great change that has in many ways affected the economy, politics and the social setting. This is particularly true with respect to social patterns and discourses; the "bureaucratic paternalism, clientelism and lack of personal or business responsibility" that had been the norm for decades had to be changed for a more market oriented approach (Franičević, 2004:235). The break up of the former Yugoslavia and the following war in the 1990s has also affected the welfare of the Croatian population in both a short- and long-term perspective.

Aggregate economic growth has been rather high and stable since the stabilization program of 1993 and has been accompanied with a low and stable inflation. The unemployment rate is on the other hand high, which carries a negative effect on subjective welfare, as can be seen in table 1. It is sometimes argued that the numbers are overstated but in relation to subjective welfare this is of lesser importance as the perception of the population is still that unemployment is a problem. Inequalities are generally perceived to have increased dramatically during the transition but how much they actually have increased is unclear and results from different studies are not coherent (Nestić, 2003).

Table 1 Economic Indicators 1998-2006

	1998	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
GDP growth	2.5	-0.9	2.9	4.4	5.6	5.3	4.3	4.3	4.8
Inflation rate	5.7	4	4.6	3,8	1.7	1.8	2.1	3.3	3.2
Unemployment rate	11.4	13.6	16.1	15.8	14.8	14.3	13.8	12.7	11.2

Source: HNB

This is all highly related to the transition setting that can be argued to create both political and economic uncertainty. The changing culture and the expectation of greater economic mobility increase aspirations and if these are not perceived to be fulfilled a considerable negative impact on subjective welfare is to be expected.

2 Analysis of Subjective Welfare: Review of Existing Literature

The study of subjective welfare is a growing field in economics and whereas developed countries are well covered, studies on transition and developing countries are of less frequency.[3] A reason for this is lack of adequate data, as a comprehensive survey with more in-depth and targeted questions than usually incorporated into the household budget surveys is necessary closely to assess subjective welfare and its determinants.

This section introduces the notion of subjective welfare in relation to objective measures of welfare, it examines the way subjective welfare is measured and briefly reviews the results of previous empirical studies in terms of the determinants of subjective welfare.

2.1 Measuring Welfare

The conventional way of measuring the welfare and poverty of an individual or a society is income defined in varying ways. Given the basic assumption that the individual maximizes his or her utility, the consumption pattern founded on available income can be seen as a sufficient measure of welfare. Graham and Pettinato (2006) among others question this; rational, material self-interest of the individual may not determine economic behaviour to the extent commonly assumed. The literature has over the years brought several problems with this assumption and measurement to our attention. Of essence for the present analysis is primarily the fact that income is often hard to measure, particularly in developing and transition countries. The income based welfare measure is likely to be inaccurate for many reasons; primarily that the informal economy in many cases is estimated as large and income in kind constitutes a large part of the household income.

The different ways of determining a level of welfare, a poverty level, that is considered to be the lowest acceptable are numerous. Income or consumption is often used, either in relative or absolute terms. Compound measures aim at giving a more incorporating picture of the individual's situation by including variables such as health and education and these have been given a greater role for economic policy. Without going into too much detail the basic insight is that poverty is a debatable notion and involves many problems both in its definition and measurement as well as what it tell us about the situation of the people living in poverty.

This is the background which has led economists to look for alternative measurements to provide a better account of individual welfare. Starting with the contribution of Easterlin (1974) questioning the relation between happiness and income, a strand of literature has focused on subjective approaches to happiness and subjective well-being. In

[3] For studies on developing countries see among others; Carletto & Zezza (2004) on Albania, Graham & Pettinato (2006) on Peru, Herrera et al. (2006) comparing Madagascar and Peru, Knight et al. (2007) on rural China, Neff. (2006) on South Africa and Ravallion & Lokshin (1999, 2000, 2002) on Russia.

latter years a new line of literature, with Ravallion (1999, 2000, 2002) as key contributions, has arisen that focuses on subjective welfare in terms of development and poverty. This latter approach has a narrow focus on economic satisfaction rather than on general happiness and has attracted the interest of economic policy makers.

The different strands of literature can be defined by the way that the individuals are asked to describe their happiness, their well-being in general, their welfare or satisfaction with more specific areas of life such as the financial or social sphere. Ferrier-i-Carbonell (2002:2) promotes the following definitions; subjective well-being denotes individual satisfaction with life or the general happiness mentioned above, whereas subjective welfare is used in the more narrow sense of financial satisfaction. Here the term *subjective welfare* will be used throughout to avoid confusion and as the focus is on financial satisfaction. In developing and transition countries, as in the case of Croatia, this later approach is very convenient as it picks up on the transforming views on income and its distribution within the country. This also as the statistical resources tend to be weak and the informal economy is a hindrance for correctly determining income (Sanfrey and Teksoz, 2005).

When assessing subjective welfare we accept the assumptions that individuals are capable of assessing their own situation in relation to the questions posed and that the answers are interpersonally comparable. This requires that different individuals perceive the scale of the question in the same way and hence the only thing determining a difference in position on the scale would be their actual subjective welfare (Ferrier-i-Carbonell, 2002:7).

There are several established ways of determining subjective welfare but common for most is an individual or household placing their situation on a scale. The *income evaluation question* (IEQ), first introduced by Van Praag (1968), asks the individuals to place themselves on a ladder with rungs ranging from rich to poor with a number of steps in between. This is a variety of the "Cantril ladder" question which asks the individual to grade his or her happiness on a scale from one to ten (Cantril, 1965). Ravallion and Lokshin (1999, 2000, 2002) use a variety of the IEQ also letting the individual grade his or her situation on a ladder where the steps signify different stages of poverty, from poor to rich, which they denote "the economic ladder question" (EQL).

Another variety of determining SW is the *minimum income question* (MIQ) asks the individual to estimate how much income is needed to "make ends meet", but can also ask the individual to estimate how much more or less income he or she would require to live exactly on a subjective poverty line. This can be a complement to determining the objective poverty line on a national basis. Focusing on poverty, the simplest way of determining subjective poverty is the straightforward question "Are you poor?" with a "yes", "no" or "do not know" answer.[4]

Apart from the form of the question, the unit of interview, the time, and the interaction with the interviewer may bias the outcome. Whether the household head is asked about the household's general welfare or his or her individual welfare, is affected by dif-

[4] In the Philippines this kind of survey on subjective poverty has been carried out for more than 20 years to provide a backup for the Household Budget Surveys that due to high costs are not carried out every year. See Mangahas (1995).

ferent aspects and will produce different outcomes. Household level answers may not be representative for the entire household, which is more evident if a random person within the household is the respondent. These issues are hard to control for but should be taken into account and sometimes reduce the weight given to certain conclusions (Ravallion and Lokshin, 2000).

Notable is that several variables are inherently unobservable which is one reason for the unexplained difference between objective and subjective welfare. One part of this is mood effects; there is clear evidence that individual assessments of SW are affected by temporary changes in mood, such as just after getting married or a win of the national football team. These are hard to control for as they also interact with more long-term personality traits and should be kept in mind when assessing results of SW (Lokshin et al. 2004:2).

2.2 Determinants of Subjective Welfare

The determinants of subjective welfare consist both of quantifiable variables, for example income and demographic characteristics and qualitative subjective variables such as trust in government institutions. In empirical studies these are found to constitute a large share of the difference between objective and subjective welfare, but still a considerable part of the difference remains unexplained.

Objective variables are quantifiable and display the situation and characteristics of the individual. Most important is income, and its role for individual subjective welfare is one of the most researched topics in subjective welfare literature. A positive correlation between income and SW has been found by, among others, Easterlin (1974, 2001). This positive correlation holds up to a certain income level, and seems to be stronger in developing countries and among the poor part of the population in richer countries. Above the threshold level the marginal benefit of income for SW diminishes. Notable also is that several studies have found little correlation between aggregate economic growth and SW and also in this case there seems to be a threshold level above which there is almost no correlation (Graham and Pettinato, 2006: 131).

The diminishing marginal benefit of income and the imperfect correlation with SW draws attention to the question of *relative income* instead of absolute as a determinant, which will be discussed more in detail below.

Personal determinants such as gender and age also play a role for SW, although gender to a smaller degree. Studies such as van Praag et al. (2000) have found differences between men and women but these go in both directions and are small. Age on the other hand has an established effect on SW and many studies have found a negative correlation between age and SW, but only up until to a certain age. The relationship is U-shaped and has its turning point around the age of 30 or 40 and after this point subjective welfare is likely to increase with age.

Education normally has a positive effect on SW but it is hard to determine whether this is due simply to the factor of education or if other factors correlated with a higher education, such as getting a fulfilling job and higher social status, also impact SW. The individual's employment status proves important for SW and being employed affects po-

sitively and unemployed negatively. This is true even if the individual is provided with the same amount of income while being unemployed, which points to unemployment having effects on SW other than the loss of income. The emotional distress of the state of unemployment is a likely cause. It has been shown to create even more mental distress than for instance being divorced, and an explanation is the low social status associated with not having a job. Having a job that one is dissatisfied with is negative, but unemployment is clearly worse (Ferrier-i-Carbonell, 2002, van Praag et al. 2000).

Demographic characteristics such as household size, marital status and composition of the household have been shown to affect the subjective welfare of individuals. Having a spouse is highly and positively correlated with SW but it is unclear in which direction causality runs. It is equally likely that being satisfied (high SW) increases the chances of finding and keeping a partner (Ferrier-i-Carbonell, 2002). In Albania people living in large households feel comparatively less poor than the ones living in single households which may both be a sign of economics of scale in consumption and mental distress from living alone and without the support of the people in the household (Carletto and Zezza, 2004).

Relative income variables have been found to be of great importance for the subjective welfare of the individual. This can be both in terms of relative income towards neighbours, region and country but also over time. Easterlin (2001) finds that subjective welfare varies positively with own income and inversely with the income of others and Ferrier-i-Carbonell (2002) finds a much higher correlation between the grading of the individual's financial situation in relation to others and SW than between absolute income and SW. The relative income of the reference group the individual feels that he or she belongs to provide a mental image of what standard the individuals consider themselves to be entitled to.

The aspect of economic mobility is important and it generates a higher subjective welfare if the individual perceives equal economic opportunities and the possibility to reach the same level as the reference group. Hirschman (1973) introduced the "tunnel effect" analogy of a traffic jam in a tunnel. In early development, welfare is enhanced by the other lanes moving faster as this gives hope for own lane to move as well. This is stronger than the feeling of envy but if the own income is not improved the individual feels frustration and relative deprivation. One example is that a correlation has been shown between rising inequalities in transition countries and decreasing subjective welfare. In the early years of transition some "lanes" move faster as economic mobility increases which is positive for SW, but only for a period of time; if the overall level of income does not increase, a strong negative effect on SW is to be expected (Sanfrey and Teksoz, 2005: 12).

The relation of income and SW is also affected by the aspect of time. If the individual expects rising incomes it tends to value his or hers present situation in a better way. Equally, if the individual is looking forward to an insufficient pension, today's SW level will be lower. Over the life cycle the average subjective welfare of a cohort stays rather constant, even though a substantial increase in income is common. Although the cohort's SW levels remain constant individuals generally think they were worse off in the past and will be better off in the future (Easterlin, 2001).

Easterlin refers to the dependence of SW on part income as habit formation. This implies that it is the change in income that generates a rise in SW rather than the absolute level of income. The individual also adapts to the increases of income by changing his or her expectations, is in the literature called adaptation theory or preference drift (Frey and Stutzer, 2002:412). Ferrier-i-Carbonell (2002) on the other hand states that adaptation theory needs to be treated with care as studies have shown that when income increases the individual adapts and we get diminishing marginal returns whereas when income drops the individual experiences a strong decline in SW.

Aspirations also affect subjective welfare. The level of income of family and parents, the education of parents, the social origins and the support given by the family build aspirations that affect SW both positively and negatively. Aspirations may boost SW if the aspirations are met but also reduce it if the individual is not able to reach the level expected (Herrera et al., 2006: 17).

Attitudinal variables such as perceived tensions in society and also the individuals' optimism about the future and other variables are interesting to analyze as determinants of subjective welfare. Ravallion and Lokshin (2002) integrate attitudinal variables into their "low dimensionality hypothesis" and find that they have a strong effect on the Pseudo-R^2 (the fit of the model) and hence that they "pick up" determining factors not shown by the objective variables. These variables are however problematic due to their possible endogeneity to SW and must therefore be treated with care and scepticism. It is however within this section that the greatest room for future studies is found.

3 Description of Subjective Welfare in Croatia

The purpose of this section is two-fold and after describing the present dataset, the correlation between the objective and subjective measures of welfare is assessed. The second step is to further investigate the correlation by profiling individual characteristics in relation to an objective and a subjective poverty line. The profiles include several variables that are incorporated in the multivariate analysis in section 4.

The data used throughout this paper is from the UNDP Croatia's *Quality of Life Survey* carried out in 2006. The study covers a rich spectrum of aspects of life and is hence very well suited for a study such as this. The survey covers 8534 respondents and is representative at the country level. The European Quality of Life Questionnaire was used as created by the European Foundation for the Improvement of Living and Working Conditions and this, with its nearly 100 questions, covers wide areas of life and society.[5]

The objective measure of welfare in the survey is total household income. The individual is asked to sum all the incomes of the household and place this sum in the suitable interval.[6] This may of course be inaccurate; particularly since the respondents are not only household heads. The respondent may hence not be aware of all parts of household inco-

[5] The first Pan-European survey was launched in 2003 and included the EU25 and three candidate countries-Romania, Bulgaria and Turkey. The actual survey in Croatia was carried out by TARGET Ltd. Market and Public Opinion Research Agency. For the full results of the survey see UNDP Croatia, Human Development Report 2006. Unplugged: Faces of Social Exclusion in Croatia (UNDP. 2006a: 21).

[6] See Appendix A for more details on questioning.

me and an underestimation is likely compared to the income reported in the household budget surveys. For instance income in kind is likely to be omitted as it is hard to quantify. Income in kind is shown to play a big role in the economy of the Croatian households but this role has been decreasing over time (Croatian Statistical Bureau 1998-2006). Mistakes in estimating income are of concern as they may bias the sample and this should be kept in mind throughout the analysis.

There are several potential questions to be used as basis for the subjective measure of welfare in the present dataset. Here the question where the individual is asked to grade how easily the household can "make ends meet" with its current income is used. It determines "financial satisfaction" and can be seen as a mix of the *income evaluation question* (IEQ) (Van Praag 1968) and the *minimum income question* (MIQ). Financial satisfaction questions are expected to correlate with the objective measure of welfare to a higher degree than a measure of general happiness.[7] Using the "make ends meet" form of question carries important advantages relative to other more conventional measures of financial satisfaction such as the IEQ or the ELQ in the terminology of Ravallion (1999) that are based on the "Cantril ladder" concept. First, the "make ends meet" question does not mention poverty, which in itself is a subjective concept that carries a strong negative association, nor does it ask the individual to compare his or her situation to that of others. As has been shown, the relative income is an important determinant of SW and by removing the clearly relative intentions of the "Cantril-type" questions any enforcement of this is avoided. Also an advantage is that the individual is asked to focus on the household's standard and not the standard of the individual.[8]

3.1 Correlation of Objective and Subjective Measures of Welfare

The cross-tabulation of the objective and subjective measures of welfare establishes the correlation and gives an idea of the extent to which other variables are explanatory. The objective measure is *total household income* divided by the number of equivalent adults in the household.[9] The measure of subjective welfare is defined by a six-rung scale determining how well the individual can "make ends meet" with the current income ranging from "with great difficulty" to "very easily". The table is constructed in such a way that for all rungs the number of individuals placed on each objective welfare rung equals the number of individuals that are on the corresponding subjective rung. The results are shown in Table 2. A perfect correlation would require all off-diagonal elements in the table to be zero.

The correlation is highly significant, Pr=0.000 and Cramer's V measure of association of 0.26 is higher than for both Albania where the same exposition generates a Cramer V of 0.23 and for Russia that has a Cramer V of 0.1.[10] This implies a closer correla-

[7] The present dataset also includes a question of general happiness, Q.53 in UNDP (2006c)

[8] Unawareness of the actual situation of the household is a problem in the same way as with the estimation of income.

[9] Using the OECD-modified equivalence scale as first proposed by Haagenars et al. (1994). The scale assigns a value of 1 to the household head, of 0.5 to each additional adult member and of 0.3 to each child.

[10] Cramer's V is a measure of association given by the square root of chi-square divided by sample size, n, times m, which is the smaller of (rows - 1) or (columns - 1): $V = [(X\,2 / nm)]$. This results in a measure of association between 0 and 1, but requires row marginal to equal column marginal.

Table 2 Cross-tabulation of Subjective and Objective Welfare

		Subjective Measure						
		1	2	3	4	5	6	Total
Objective Measure	1	365	238	221	67	49	8	948
	2	291	383	528	116	88	19	1.425
	3	261	580	1.198	450	203	49	2.741
	4	26	174	552	405	170	46	1.373
	5	3	41	202	267	179	84	776
	6	2	9	40	68	87	80	286
	Total	948	1.425	2.741	1373	776	286	7.549

Note: Pearson chi2(25) = 2,5e + 03; Pr = 0,000; Cramér's V = 0,2577.

Source: UNDP, 2006c.

tion between income and subjective welfare in Croatia than in the above mentioned peer transition countries. This may be due to differences in the methodologies of the surveys and the wording of the questions and hence a detailed comparison is of lesser importance. More important is the similarity of the results, which confirms the hypothesis that there is generally a gap between objective and subjective welfare and that this applies to transition countries and also to the case of Croatia.

More specifically, when examining individual objective rungs it is found that fewer than 50% of the individuals place themselves in the "right" rung subjectively. If the sample is cut in half, which means the lowest three rungs, 79% of those objectively within the rungs place themselves in the same half subjectively. Out of the individuals placing themselves in the lowest subjective rung only 38% are objectively in the same rung and regarding the two lowest rungs together nearly 54% are both objectively and subjectively within these rungs. The two lowest rungs constitute limit for the subjective poverty line below. The fact that only 50% of the individuals subjectively within these rungs also are objectively placed in the same rungs should be remembered when analysing the poverty profiles.

3.2 Objective and Subjective Profiles of Poverty

The difference between the two measures is further investigated by profiling the objective and subjective poverty rates according to a range of characteristics.

Any random level of welfare could have been used for this comparison but as there is a debate in Croatia about the actual levels of subjective poverty and since the approach to defining a measure of objective poverty is weak it is useful to highlight the different measures of poverty in this comparison (Nestić, 2006, Nestić and Vecchi, 2006a).

The official poverty measure in Croatia is 60% of median income as reported by the Croatian Statistical Bureau (CBS) on a yearly basis. The measure is used in order to be comparable with the standard measures used by the European Union. In the profile of poverty the measure is based on the present survey and the poverty rate becomes slightly di-

fferent from the CBS rate for 2005. The median income of the survey is 2,250 Kuna per month and equivalent adult out of which 60% equals 1,350 which in turn generates a poverty rate of 27%. This is high compared to the "at risk of poverty rate" (without income in kind) calculated by the CBS, which was 19.9% for 2005. The source of the difference is probably the character of the survey's questioning on income but does not imply that the results of the present survey should be rejected, particularly as other and similar studies generate the same results.[11]

The established objective measure of poverty corresponds fairly well with the number of people grading themselves within the two lowest rungs of the subjective question. Placing oneself in the two lowest rungs signifies that the individual considers that ends are met with great difficulty or with difficulty. With these definitions the poverty rates are 27% for objective poverty and 30.9% for subjective poverty. The subjective rate is 4% higher but even though this is higher it seems reasonable when turning to the definitions of the question. Living *with difficulty* seems intuitively equivalent to living in some poverty and would correspond well with the "at risk of poverty" level of 60% of median income.

Table 3 below seems to confirm many of the stylized facts from the previous studies reviewed in chapter 2. Particularly the adaptation theory seems validated. The subjective poverty rate is remarkably higher than the objective rate among those relatively well off. These are individuals active in the labour force, highly educated and living in urban areas and particularly the city of Zagreb. They are likely to have a comparatively higher income, for instance the group that has employment status "active" and "higher education" has an average income of 4415 kuna per month whereas the average income of the full sample is 2570 kuna per month. The group is on the other hand likely to have a reference group that is wealthier than the average. Possibly the reference group of this section of the population is not only the wealthiest in Croatia but is also to be found in international circles. Travelling and a more frequent use of internet and media are likely among this part of the population. This outcome can also be attributed to the "ever rising bar of perceived needs" pushing a higher subjective poverty (Graham and Pettinato, 2006: 132). This is particularly important when the transition setting of Croatia is taken into account. Inherent to the transition process is the hope and expectation of improving living standards.

On the other hand the young (15-24 years of age), those with no or low education, homemakers, members of large families and individuals living in Eastern Croatia (mainly rural areas) have a lower rate of subjective poverty than objective poverty. These are also the groups in which the greatest percentage lives below both the objective and subjective poverty line (apart from the age group 15-24). The poorest groups in addition include people who are over 65 years of age, retired, unemployed and living in single households.

4 Multivariate Analysis: Determinants of Subjective Welfare in Croatia

The difference between the objective and subjective measure of welfare has now been established both by cross-tabulation and in terms of objective and subjective poverty lines. The next step is to investigate what, other than income (the objective welfare), can explain the subjective welfare of the individual.

[11] See Šućur (2005) that is based on a similar survey carried out by the Croatian Caritas.

Table 3 Objective and Subjective Profiles of Poverty

	Objective Poverty Rate[a]	Subjective Poverty Rate[b]	Change (%)
Total	27	30.9	14
Gender			
Female	29.2	33.92	16
Male	25.7	27.73	8
Age			
15-24	18.5	17.51	-5
25-49	18.1	28.26	56
50-64	28.1	37.13	32
65-	42.1	44.12	5
Employment status			
Active	10.9	21.61	98
Inactive - unemployed	41.8	48.85	17
Retired	33.8	38.7	14
Homemaker	47.0	45.44	-3
In education	15.5	16.04	4
Education status			
No education/unfinished primary	56.2	55.29	-2
Full primary education	37.7	41.38	10
Professional training	20.4	29.16	43
Higher education	8.3	17.25	109
Health status			
Good health	24.6	31.26	27
Average health	25.2	31.55	25
Poor health	23.2	32.32	39
Household size			
1	41.6	43.88	6
2	29.1	36.53	26
3	18.7	28.48	52
4	15.5	25.11	62
5	25.5	28.1	10
6	24.1	30.65	27
7 and more	36.6	34.65	-5
Remittances			
Receiving	21.7	28.04	29
Not Receiving	25.7	32.59	27
Rural vs. urban home			
Rural	26.8	32.37	21
Urban	12.3	26.74	118
Region			
Central	25.2	33.12	31
Eastern	37.8	37.79	0
Zagreb	11.6	24.57	112
Adriatic North	18.4	23.72	29
Adriatic South	18.7	30.34	62

[a] *Total household monthly income, per equivalent adult divided by poverty line of 60% of median income*
[b] *How well ends are met with the current available income, with difficulty and with great difficulty are considered as poverty.*

Source: UNDP, 2006c.

The multivariate analysis in this section is inspired by the Ravallion and Lockshin (1999) "low dimensionality hypothesis". By including more variables than just household income to explain the level of subjective welfare they test whether the standard income measure, in their case of poverty, can be extended to better account for the true welfare of the households. A similar study, Herrera et al. (2006), compares the determinants of SW for Peru and Madagascar.

Initially, subjective welfare is analyzed in a basic model with income as the only explanatory variable. This can be seen as estimating the explanatory power of objective welfare for subjective welfare and creating a benchmark for the following analysis. The basic assumption is a continuous underlying variable determining where individuals place themselves on the subjective welfare ranking, from making ends meet with great difficulty to making ends meet very easily. This latent continuous variable, which denotes the individual's true welfare is here called *w* and assumed to be determined by the logarithm of total household income per equivalent adult (from now on simply income) denoted by ln(y) and a range of other variables, for now lumped together in the error term *e*. The model formalized:

$$w = b\ln(y) + e \tag{1}$$

If *w* is lower than, for example, c1 the individual is placed in the lowest category and if *w* is between c1 and c2 the individual is placed in the second lowest category and so on. Also assuming that *e* is normally distributed, an ordered probit model can be used to estimate the determinants of subjective welfare. Probit is a maximum likelihood estimation and the coefficients reported maximizes the likelihood function. The maximum likelihood estimates are the parameters most likely to produce the actual data.

If the coefficient is positive the individuals are more likely to place themselves on a higher rung of subjective welfare. When interpreting the coefficients it is important to note that they do not constitute marginal effects. Marginal effects can instead be calculated for each rung of the categorical dependent variable.[12]

Running the ordered probit regression with income as the only variable generates the following results:

As expected, the estimated coefficient for income is significant and positive, which implies a positive effect on subjective welfare from an increase in income. The Pseudo R^2 is very low, which tells that the explanatory power of this model is weak.[13] Factors in addition to income are affecting subjective welfare but it is notable that in this type of model only a limited explanatory power is expected due to some specific factors. Among them are unobserved personality traits and measurement errors captured in the error term. Measurement errors such as mistakes in people's answers are mostly random and will not considerably bias the sample. This would also apply to the order of questions, the daily mood of the individual and similar disturbing effects. On the other hand the unobserved

[12] See Appendix C for marginal effects of the full ordered probit model.

[13] The Pseudo R^2 measure calculated by STATA is by Veall & Zimmermann (1996) argued to be downward biased for this type for study and other measures such as the Aldrich and Nelson R^2 should generate a stronger explanatory power. This should be considered when assessing the results from the probit model.

Table 4 Estimate of Ordered Probit Model of Subjective Welfare and Income

	Coefficient	Standard Error
Income	0.634	0.0151
cut1	3.918	0.121
cut2	4.693	0.124
cut3	5.775	0.127
cut4	6.464	0.129
cut5	7.230	0.133
Number of observations		7,526
Pseudo R^2		0.0764

Source: UNDP, 2006c.

personality traits can be correlated with the socioeconomic variables in the sample, as well as with how the individual responds to subjective welfare questions, and hence bias the sample. Examples of these traits could be whether the individual is a "happy" or "unhappy" person or optimistic versus pessimistic in general. These traits could be controlled for by conducting repeated surveys on the same individuals as these types of qualities in a person are likely to be rather constant over the lifetime (Ravallion & Lokshin (1999).

After the conclusion that income has a positive and significant effect on subjective welfare, further variables that are likely to be of importance in determining subjective welfare are included into the model. Here the variables are divided into two broad groups; (i) *objective variables* of personal or household circumstances and (ii) measures of *relative income,* compared with different reference groups.

The model incorporating these groups:

$$w = bln(y) + g1\ x\ 1 + g2\ x\ 2 + e \qquad (2)$$

Where:
x1 – objective variables
x2 – relative income variables.
The results of the ordered probit model are given in table 5.[14]

From the model with only income as an explanatory variable, it is clear that income is likely to generate a higher SW and the inclusion of income into the full model confirms the strong and positive relationship. Being female rather than male makes it more likely for the respondent to be in a low SW category and by examining the marginal effects for individual SW categories it is found that being female increases the likelihood of being in the three lower categories (see Appendix C). Possible explanations can be cultural aspects inherent in Croatian society and also that women are more likely to be poor than men (see section 3, table 3).

[14] Categorical variables such as education level and employment status are to be analyzed in relation to the omitted category, the reference category. Hence on an indicator variable like gender the chosen category female is analyzed as: what is the effect of being in the category female, rather than in the omitted category male.

Table 5 Multivariate Ordered Probit Model of Subjective Welfare

Dependent Variable:				
Thinking of your household's total monthly income, is your household able to make ends meet:				
With great difficulty With difficulty With some difficulty		Fairly easily Easily Very easily		
Explanatory variables		*Category*	*Coefficient*	*Standard Error*
(i) objective variables				
Total income of household (log)			0.416	0.021[a]
Gender (female)			-0.098	0.027[a]
Age			-0.003	0.001[b]
Health (self-graded health status)			0.090	0.006[a]
Education status				
		No education/unfinished primary	-0.105	0.055[c]
		Full primary education	-0.134	0.046[a]
		Professional training	-0.147	0.033[a]
		Higher education	reference	
Employment status				
		Active	0.166	0.041[a]
		Inactive- unemployed	reference	
		Retired	0.308	0.052[a]
		Homemaker	0.153	0.060[b]
		In education	0.374	0.063[a]
Household size (log)			-0.322	0.030[b]
Remittances (receiving)			0.059	0.030[a]
Population in home town			-0.088	0.014[a]
Region[d]				
		Central	-0.020	0.052
		Eastern	-0.017	0.061
		Zagreb	reference	
		Adriatic North	0.103	0.061[c]
		Adriatic South	-0.120	0.055[b]
(ii) relative income variables				
Regional Gini coefficient[e]			-0.011	0,005[b]
Average income of region			0	0[a]
Financial situation relative to majority			0.721	0.021[a]
Pseudo R^2	0,1628	cut1	3.971	0.239
Number of observations	7,373	cut2	4.900	0.240
		cut3	6.147	0.242
		cut4	6.942	0.244
		cut5	7.821	0.247

[a] significant at 1% , [b] significant at 5%; [c] significant at 10%; [d] Using the World Bank (2007:28) 5-region disaggregation; [e] Regional Gini coefficients as calculated by Nestić & Vecchi (2006b)

Source: UNDP, 2006c.

The model shows that with increasing age the likelihood that individuals grade themselves in a lower category of subjective welfare increases. In many studies a U-shaped relationship between age and SW is encountered; up until a certain threshold age, the correlation is negative but after this age is likely to increase SW or at least not be increasingly negative. The interesting part is at which point the threshold age is found. By a graphic examination of the relation between the mean of the SW grading and age in the categories used in the poverty profiles in chapter 4, a vague u-shaped relation can be seen and it is only for the category 65 years and older, that SW is no longer decreasing with age. This is in line with what has been found in other transition countries, the decline in SW continues to an age older than is usually found in non-transition countries (Sanfrey and Teksoz, 2007). As absolute poverty is high among the elderly this relationship is interesting. The relationship cannot be explained by decreasing needs (real or perceived) as determined by the MIQ. The average minimum income perceived to be required by this group is only 9 percent lower than for the entire sample whereas the actual income is 40 percent lower. Other factors are likely to be determining this and the closest candidates are aspects of personality that develop with age, like greater patience and lower expectations.

High education and an active working life result, as expected, in a higher likelihood of individuals placing themselves in a high SW category. Regarding employment status all other states are better than being inactive, even being a home maker which does not, per se, generate a salary. This confirms the theory that it is not the monetary loss of being unemployed that is important for SW but rather the low social status and psychological distress of losing employment.

As the number of individuals in the home town rises, the likeliness of high subjective welfare decreases. This is a common finding in empirical studies and can be explained by the often smaller and more coherent reference group in the smaller city. Compared to living in Zagreb, living in the Central, Eastern and Northern Adriatic regions increases the SW. The categories of the variable region are jointly significant, but not individually significant and hence only a brief attempt to explain the results will be made. The Central and Eastern regions have the lowest average income whereas the Northern Adriatic, which includes the counties of Istria, Lika Senj and Primorje Gorski Kotar has the highest average income after Zagreb. Whether other regional factors affect this relationship is beyond the scope of this study but may well provide insights for SW theory.

Moving on to the group of relative income variables a contradictive relation reveals itself. The higher the regional Gini coefficient is, the more unequal the income distribution is in the region[15], the less likely is the individual to have a high SW level. This implies that equal regional incomes are likely to be positive for subjective welfare. Opposing this is the variable self graded financial situation relative to the majority, which is highly positive and significant. It has stronger marginal effects in all categories of SW than the Gini coefficient, which implies a stronger effect on SW. It also has higher marginal effects than the absolute income variable, which speaks in favour of the hypothesis that relative income, the income of the reference group, is important and even more important

[15] Here region signifies one of the twenty one administrative divisions of Croatia called zupanija or county.

than the absolute level of income. In fact it has the highest marginal effects out of all the variables in the model which confirms the importance of relative income for SW.

When bringing together the analysis from the descriptive part and the multivariate analysis we find an anomaly regarding the groups with both the lowest absolute objective and subjective poverty. They are those active in the labour market, the highly educated and those living in urban areas. These are characteristics that are likely to have a positive impact on subjective welfare if we look at the multivariate analysis, but at the same time the people in these groups are those most prone to perceiving themselves as poorer than they really are. This is an interesting fact, particularly from a social or psychological point of view and relative income and the particular reference groups of urban people may as mentioned be an explanation.

In general the results are as expected and confirm the hypothesis that the difference between objective and subjective welfare can be explained by a broad spectrum of variables where relative income plays an important role.

5 Conclusions

The difference between objective and subjective welfare in the case of Croatia has been confirmed within the present dataset and a wide range of variables have been found to be determining. As to the objective and subjective profiles of poverty it is important to note the differences between the two; it is clear that it is those with high objective welfare that perceive themselves as subjectively poorer. Even though the determinants are positive for subjective welfare in the framework of the multivariate model, these groups still in general perceive themselves as poorer than they are. This strongly support the adaptation theory and preference drift and is not surprising in Croatia's transition setting. The sharp changes in socio- economic environment of the past 15 years have increased the expectations for future earnings and stand in sharp contrast to the past context of socialism. The transition heritage is also interesting in terms of the effects of income inequalities on subjective welfare. This is also displayed in the results from the multivariate analysis where there was a contradictive relation between income equality, which is positive for subjective welfare, and the financial situation of the individual relative to majority, which implies that being above the majority increases SW. This can be seen as a display of the contradictive state of development, the lingering solidarity mixed with the newly rich and the increasing differences in income.

In addressing general welfare and poverty issues the results from this study tell us that it is the generally approached determinants of poverty that should be focused upon. It also shows that in addressing these, such as low income, unemployment and low incomes for retired people there is no particular effect on subjective welfare, as the objective and subjective measures coincide to a large extent regarding these groups. Hence, in order the raise the level of subjective welfare, the best path is to address the objective variables generally acknowledged as being associated with poverty alleviation. Policy measures range from promoting education and fighting unemployment and a general promotion of aggregate growth and increasing individual incomes. Fighting inequalities is of particular importance in transition countries as relative income is strongly determining for subjective welfare.

The main conclusion to be drawn is that the basic determinants of subjective welfare in Croatia confirm the general view of what determines subjective welfare. It provides a fundamental for further research; there is particular interest in the variables composing the measures of social exclusion increasingly used to define poverty. The determining power of these variables for subjective welfare could be important in both a theoretical perspective and and in welfare and poverty alleviation policy.

To conclude, this study has proven the difference between objective and subjective measures of welfare and the strong influence from other variables on the subjective welfare of the individual. Further research, more interest and a greater recognition from policy makers is invited as this kind of research provides a basis for targeted policy measures that may focus upon what is truly important for the welfare of the individual, as the individual him or herself perceives it.

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Appendix A

Full outline of the questions in the Quality of Life in Croatia Survey determining objective and subjective welfare:

Objective welfare

Q 80. Using this card, if you add up all of these income sources (for all household members), which letter corresponds with your household's total net income, that is the amount that is left over after taxes have been deducted? If you don't know the exact figure, please give an estimate.

1	up 500	12	10,001 – 12,000
2	501 – 1,000	13	12,001 – 14,000
3	1,001 – 1,000	14	14,001 – 16,000
4	1,501 – 2,000	15	16,001 – 18,000
5	2,001 – 3,000	16	18,001 – 20,000
6	3,001 – 4,000	17	20,001 – 25,000
7	4,001 – 5,000	18	25,001 – 30,000
8	5,001 – 6,000	19	30,001 kn and more
9	6,001 – 7,000	20	(Refused)
10	7,001 – 8,000	21	(Don't know)
11	8,001 – 10,000		

Subjective welfare

Q 69. A household may have different sources of income and more than one household member may contribute to it. Thinking of your household's total monthly income is your household able to make ends meet:

Very easily	With difficulty
Easily	With great difficulty
Fairly easily	(Don't know)
With some difficulty	

When used in the statistical analysis the order of the responses has been replaced as: With great difficulty, With difficulty ... Very easily

Appendix B

Definition of Analytical Regions

Central Croatia:	Krapina-Zagorje, Sisak-Moslavina, Karlovac, Varaždin, Koprivnica-Križevci, Bjelovar, Međimurje
Eastern Croatia:	Virovitica-Podravina, Požega-Slavonija, Slavonski Brod-Posavina, Osijek-Baranja, Vukovar-Srijem.
Zagreb Region:	Zagrebačka County, Zagreb City
Adriatic North:	Primorje-Gorski kotar, Lika, Senj, Istra
Adriatic South:	Zadar, Šibenik-Knin, Split-Dalmacija, Dubrovnik-Neretva

Appendix C

Marginal Effects of Variables in Ordered Probit Model

Marginal Effects Outcome 1	**"Making ends meet with great difficulty"**	
(i) Objective variables		marginal effect (dy/dx)
Total income of household (log)		-0.0503
Gender (female)		0.0117
Age		0,0004
Health (self-graded health status)		-0.0109
Education status		
	No education/unfinished primary	0.0135
	Full primary education	0.0174
	Professional training	0.0178
	Higher education	reference
Employment status		
	Active	-0.0198
	Inactive/unemployed	reference
	Retired	-0.0338
	Homemaker	-0.0168
	In education	-0.0353
Household size (log)		0.0390
Remittances (receiving)		-0.0073
Population in home town		0.0106
Region		
	Central	0.0025
	Eastern	0.0021
	Zagreb	reference
	Adriatic North	-0.0117
	Adriatic South	0.0154
(ii) Relative income variables		
Regional Gini coefficient		0.0013
Average income of region		0.0000
Financial situation relative to majority		-0.0872

Marginal Effects Outcome 3	**"Making ends meet with some difficulty"**	
(i) Objective variables		marginal effect (dy/dx)
Total income of household (log)		0.0014
Gender (female)		0.0001
Age		0.0000
Health (self-graded health status)		0.0003
Education status		
	No education/unfinished primary	-0.0020
	Full primary education	-0.0029
	Professional training	-0.0004
	Higher education	reference
Employment status		
	Active	-0.0003
	Inactive/unemployed	reference
	Retired	-0.0073
	Homemaker	-0.0036
	In education	-0.0226
Household size (log)		-0.0011
Remittances (receiving)		0.0006
Population in home town		-0.0003
Region		
	Central	-0.0001
	Eastern	-0.0001
	Zagreb	reference
	Adriatic North	-0.0012
	Adriatic South	-0.0022
(ii) Relative income variables		
Regional Gini coefficient		0.0000
Average income of region		0.0000
Financial situation relative to majority		0.0024

Marginal Effects Outcome 6	**"Making ends meet very easily"**	
(i) Objective variables		marginal effect (dy/dx)
Total income of household (log)		0.0116
Gender (female)		-0.0028
Age		-0.0001
Health (self-graded health status)		0.0025
Education status		
	No education/unfinished primary	-0.0027
	Full primary education	-0.0034
	Professional training	-0.0041
	Higher education	reference
Employment status		
	Active	0.0048
	Inactive/unemployed	reference
	Retired	0.0102
	Homemaker	0.0050
	In education	0.0050
Household size (log)		-0.0090
Remittances (receiving)		0.0016
Population in home town		-0.0025
Region		
	Central	-0.0006
	Eastern	-0.0005
	Zagreb	reference
	Adriatic North	0.0031
	Adriatic South	-0.0031
(ii) Relative income variables		
Regional Gini coefficient		-0.0003
Average income of region		0.0000
Financial situation relative to majority		0.0202