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Anti-Inflation Policy Benefits the Poor: Evidence from Subjective Well-Being Data

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Anti-Inflation Policy Benefits the Poor: Evidence from Subjective Well-Being Data

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Abstract: Using subjective well-being data for more than 91,000 individuals in 30 OECD countries, 1990-2008, we study how people's implicit aversion towards inflation varies with income and other socio-economic characteristics. While inflation aversion decreases with income, it increases with the education level. Contrary to previous findings using stated-preference methods, these relationships apply not only to absolute inflation aversion, but also to the aversion towards inflation relative to unemployment. These results survive several robustness checks. The differing results concerning the roles of income and education suggest that different dimensions of being disadvantaged influence the well-being effects of inflation in different ways.

JEL classifications: E31; E24; I31; I32

Keywords: inflation; unemployment; poverty; social incidence; subjective well-being

1. Introduction

Public preferences about macroeconomic priorities are an essential factor for public policy making in democratic societies. In particular, the relative importance to be attached to anti-inflation and anti-unemployment policies is a controversial issue in the design of economic institutions and economic policy in many countries. This controversy often invokes – explicitly or implicitly – the social incidence of inflation, that is, whether inflation is more detrimental to the poor or to the rich. This question has also been an issue of concern in recent research literature.

The literature on anti-inflation preferences and, in particular, on “Inflation and the Poor” (Easterly and Fischer 2001) has addressed these issues using results of international surveys in which individuals were asked whether they think inflation is an important national problem and how important it is in comparison with other problems (Easterly and Fischer 2002; Scheve 2004; Jayadev 2006, 2008). These papers have studied how attitudes to inflation are affected by having a low level of income along with other dimensions of being disadvantaged, in particular being less educated.¹

In addition to those stated-preference studies, another strand of literature has followed an experience-based approach. These papers have studied inflation aversion in an implicit way by measuring the correlation between people’s stated subjective well-being and the levels of inflation and other macroeconomic indicators prevailing in their countries (Di Tella et al. 2001, 2003; Wolfers 2003; Welsch 2011). By focusing on the inflation sensitivity of an average individual, mostly in comparison with her sensitivity to the level of unemployment, this type of analysis has largely neglected the differentiation of those implicit preferences according to income and other socio-demographic characteristics.

The present paper follows the experience-based approach to identifying people’s macroeconomic priorities. We use life satisfaction regressions involving 91,195 individuals in

¹ These papers also discuss a-priori arguments for why anti-inflation policy may be pro-poor or pro-rich.

30 OECD countries, 1990-2008, to assess how inflation and unemployment have affected people's subjective well-being.² Following earlier literature we take the magnitudes of the respective coefficients to indicate the strength of absolute inflation and unemployment aversion, whereas their ratio indicates relative inflation-unemployment aversion. Unlike earlier papers, our regression analysis differentiates these effects according to people's income category, education level and other socio-demographic characteristics. This way we are able to measure not just how strongly an average person dislikes inflation relative to unemployment, but also how absolute inflation and unemployment aversion and relative inflation-unemployment aversion vary with income and other personal attributes.

Our main qualitative results are as follows: (i) The average person in OECD, 1990-2008, displays strong relative unemployment aversion (coefficient on percentage inflation /coefficient on percentage unemployment < 1). (ii) Relative unemployment aversion applies to people from all income categories considered, but to different degrees. (iii) Absolute inflation aversion decreases with income. (iv) Absolute unemployment aversion does not vary systematically with income. (v) Aversion towards inflation relative to unemployment decreases with income. (vi) In addition to income, the education level has an independent effect on the aversion towards both inflation and unemployment

These results are robust to controlling for people's employment status, age and sex. Being based on the correlation between personal well-being and measured rates of inflation, rather than on stated attitudes, the results are not subject to cognitive bias as to the effects of inflation. By considering objective rates of inflation and unemployment jointly, the results implicitly account for any trade-off between anti-inflation and anti-unemployment policy, should it exist.³

² Self-rated life satisfaction (elicited in surveys) is a common measure of subjective well-being.

³ The existence or non-existence of a short run NAIRU seems to be an unresolved issue (for a survey, see Ball and Mankiw 2002).

Data on subjective well-being (happiness, life satisfaction) are accepted as a reasonably good approximation of utility in a growing literature in economics (Kahneman and Krueger 2006). The relationship between happiness or life satisfaction and utility is extensively discussed in, e.g., Frey and Stutzer (2002), along with methodological issues concerning the utilization of subjective data in economic analysis. More general discussions of the use of life satisfaction data in economics are provided by Layard (2005), Di Tella and MacCulloch (2006), and Bruni and Porta (2007). Caveats that may apply to the current application of life satisfaction data will be addressed below.

The paper is organized as follows. Section 2 provides a review of the previous literature. Section 3 presents the data and econometric approach. Section 4 reports and discusses the empirical results. Section 5 concludes.

2. Previous Literature

Several reasons have been discussed in the literature for why inflation may be more detrimental or less detrimental to the poor than the non-poor.

Easterly and Fischer (2001) point out that the portfolios of the poor may have a larger share of cash and that the poor are less likely than the rich to have access to financial instruments that hedge in some way against inflation. In addition, the poor may depend more than the rich on state-determined income that is not fully indexed. An additional consideration is that human capital may be a good hedge against inflation, so the poor, to the extent that they are less well educated, feel less protected against inflation. On the other hand, the non-poor may be more affected by inflation through non-indexed progressivity of the tax system or they may simply know more about the damage that inflation can do to the economy.

Considering inflation together with unemployment, the poor may have a higher risk of unemployment, which would make them think of inflation as a less serious problem *relative*

to unemployment (Scheve 2004). This latter reasoning applies not just to the differentiation of inflation by income but also by skill level and social class (Jayadev 2008).

Due to these ambiguities, differing preferences about inflation among the rich and the poor are an empirical issue. As mentioned in the introduction, previous studies on this question can be classified in terms of their method (stated-preference approach or experience-based approach) and their focus. Table 1 presents an overview of some key contributions.

Easterly and Fischer (2001) use the statements of about 32,000 survey respondents in 19 developing and 19 developed countries in 1995 to study absolute inflation aversion. Their key dependent variable is a zero/one variable that indicates whether or not a respondent mentions “inflation and high prices” among the top 2 or 3 concerns from a list of 4 economic and 14 non-economic issues. They run probit regressions of this variable on dummy variables for seven income categories that range from “rich” to “very poor” along with three levels of educational attainment. They find that the poor and the less well educated are significantly more likely than the non-poor and the better educated to mention inflation as a top national concern. This finding is robust to inclusion of occupational group, age and sex as additional attributes that may affect the attitude towards inflation.

Rather than the question of whether or not people consider inflation to be a top national concern (absolute inflation aversion), Scheve (2004) addresses people’s attitude on whether curbing inflation or reducing unemployment should be given greater priority (relative inflation aversion) and studies how this attitude varies with income. He uses a pooled cross-section of data from 20 advanced economies, involving about 55,000 individuals in the years 1976, 1985, 1990, 1996 and 1997. By running logit regressions of the zero/one variable “inflation priority” on a number of explanatory variables he finds that people’s stated relative inflation aversion is increasing in their income. This finding is robust to inclusion of educational attainment, age, sex and a dummy variable for being unemployed as additional explanatory variables.

A similar analysis of stated relative inflation aversion is provided by Jayadev (2006), using a cross section of about 14,000 individuals in 17 mostly developed countries in 1996. He finds the probability that people give “keeping down inflation” priority over “keeping down unemployment” to be increasing in income, independent of whether or not controlling for educational attainment, age, sex, and unemployed status.

Jayadev (2008) uses the same data and dependent variable to study how relative inflation aversion varies with “class”. He finds that less skilled workers and people from self-assessed lower class are less likely to prioritize keeping down inflation rather than unemployment. These results are robust to inclusion of income, age, sex, and unemployed status.

All of these studies find measures of average relative inflation aversion to be below one. In the data of Easterly and Fischer (2001), the percentage of respondents that mention inflation as a top national concern divided by the percentage that mention recession and unemployment as a top national concern is about 0.7. In both the Scheve (2004) and the Jayadev (2006, 2008) data, the overall fraction of people who give priority to curbing inflation over fighting unemployment is about 0.4.

Average relative inflation aversion has also been studied by means of an experience-based approach, that is, by measuring how people’s subjective well-being (SWB) in a number of countries and years varies with prevailing rates of inflation and unemployment.

Di Tella et al. (2001) used SWB data from 12 member countries of the European Union (EU12), 1975-1991. They found the coefficients on inflation and unemployment in their well-being regressions to be significantly negative. Average relative inflation aversion, as measured by the ratio of those coefficients, ranges from 0.43 to 0.70. Di Tella et al. (2003) slightly extended that data set to cover the years 1975-1992 and found a ratio of 0.52, controlling for GDP per capita and the benefit replacement rate.

Wolfers (2003) extended the European Union data set to 16 countries, 1973-1998 and found an average relative inflation aversion, as defined above, of 0.21, controlling for fluctuations in inflation and unemployment rates.

Welsch (2011), using SWB data from EU12, 1992-2002, and controlling for per capita GDP and institutional variables, found the measure of average relative inflation aversion to be 0.96 when GDP growth is controlled for and 0.50 when it is not controlled for.

Unlike the previous literature, which has focused on one out of three issues, (a) average relative inflation aversion, (b) differing absolute inflation aversion by income, or (c) differing relative inflation aversion by income or class, the remainder of this paper addresses all of the issues (a) – (c) within a common, experience-based framework.⁴

3. Empirical Framework

3.1 Data

In our analysis we restrict ourselves to developed countries (OECD countries) because unemployment rates in developing countries are often not meaningful due to the existence of large informal sectors of the economy (Blanchard et al. 2010). Our data comes from two main sources. The rates of inflation and unemployment (as well as GDP growth and per capita GDP) are taken from the OECD online database, available at <http://www.oecd.org>. Data on people's life satisfaction and their socio-demographic characteristics comes from the World Values Surveys, see <http://www.worldvaluessurvey.org>.

The World Values Surveys (WVS) were conducted in four so-called waves around 1990, 1995, 2000, and 2005. The WVS methodology consists of the administration of detailed questionnaires in face-to-face interviews. The questionnaires from the most recent waves have

⁴ Scheve (2004) states that the experience-based approach (subjective well-being approach) “is well suited to producing a single estimate of how inflation and unemployment affect welfare. However, this approach does not allow analysis of variation in macroeconomic priorities across individuals”. This latter assessment, however, applies only to the specific, two-stage procedure adopted by Di Tella et al. (2001), to which Scheve (2004) refers.

consisted of about 250 questions. In each country the questionnaires are administered to between about 1,000 and 3,500 persons with an average in the fourth wave of about 1,330 interviews per country. The data used in this study refer to 1990 (first wave), 1995-1999 (second wave), 2000-2001 (third wave) and 2005-2008 (fourth wave).

The variables from the WVS used in this study refer to life satisfaction and to the interviewees' socio-demographic characteristics, in particular income and educational attainment. Life satisfaction, which will be our dependent variable, is the response to the following question: "All things considered, how satisfied are you with your life as a whole these days?" and is measured on a 10-point scale, where 1 = "dissatisfied" and 10 = "satisfied".

Self-assessed income is measured on a scale from 1 = "low income" to 10 = "high income" and should be interpreted as relating to relative income. In our main analysis, we aggregated those categories into four income classes which approximately correspond to quartiles: low income (first two categories, corresponding to the bottom 22 percent of respondents), lower middle income (third and fourth category, comprising 28 percent), upper middle income (fifth and sixth category, comprising 23 percent), and high income (seventh to tenth category, comprising 27 percent). In robustness checks we will consider alternative measurements of income.

The levels of education, whose influence on inflation aversion will be examined, are "some primary education" (26.4 percent), "some secondary education" (49.8 percent), and "at least some university education" (23.7 percent). Control variables used in additional robustness checks are age (in ten-year blocks), sex (female), and being unemployed.

In the empirical analysis we will use two different samples. The larger sample contains 91,195 valid observations in 30 member countries of OECD.⁵ We have 77 country-year

⁵ Following OECD conventions, the countries are grouped in six regions: Canada, Mexico, USA (region OECD-America); Japan, Korea (region OECD-Asia); Australia, New Zealand (region OECD-Pacific); Austria, Belgium, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Switzerland, UK

clusters, where the number of years per country ranges from one to four (averaging about 2.5). This sample does not include the education level due to unavailability of this variable for some countries mainly in the first wave. A smaller sample includes educational attainment as well; it consists of 66,699 observations in 58 country-year clusters. Summary statistics of the variables in those two samples are presented in Table A1 in the Appendix.

3.2 Econometric Approach

A basic version of our life satisfaction regression is stated as follows:

$$LS_{ict} = \beta_p p_{ct} + \beta_u u_{ct} + \beta_m macro_{ct} + \beta_d demographics_{ict} + \sum_r \gamma_r region_r + \sum_w \delta_w wave_w + \varepsilon_{ict} \quad (1)$$

where LS_{ict} denotes life satisfaction of individual i in country c and year t . The variables p_{ct} and u_{ct} are the rates of inflation and unemployment, respectively, and β_p and β_u the associated coefficients. The unemployment and inflation rates are measured in percent. The vector $macro_{ct}$ comprises macroeconomic controls (annual GDP growth rate and GDP per capita) whereas the vector $demographics_{ict}$ comprises a set of individual i 's socio-demographic characteristics (age, sex, civil status, number of children, employment status, income, education level). The variables $region_r$ and $wave_w$ are region and wave dummies, γ_r and δ_w are the associated coefficients, and ε_{ict} is an error term.⁶

Extended versions of eq. (1) include interactions of the inflation and unemployment rates with dummy variables for income class, education level and other personal

(region OECD-Western Europe); Czech Republic, Hungary, Poland, Slovak Republic, Turkey (region OECD Eastern Europe); Denmark, Finland, Iceland, Norway, Sweden (region OECD-Scandinavia). OECD countries Chile and Slovenia are excluded because data are incomplete.

⁶ Our tattered sample (with the number of years per country ranging from one to four) does not permit to use country dummies. Instead, we use region dummies since they have been found to effectively control for unobserved country heterogeneity in WVS data when degrees of freedom do not permit the use of country fixed effects (Fischer 2010). The definition of regions is given in footnote 5.

characteristics. These equations will allow us to study if and how the effects of inflation and unemployment on people's well-being vary with income, education and other attributes.

To illustrate in more specific terms, the interaction model including income and education categories takes the following form:

$$\begin{aligned}
 LS_{ict} = & (\beta_p^0 + \sum_{j \neq 0} \beta_{p,inc}^j d_{inc}^j + \sum_{k \neq 0} \beta_{p,edu}^k d_{edu}^k) \cdot p_{ct} + \\
 & (\beta_u^0 + \sum_{j \neq 0} \beta_{u,inc}^j d_{inc}^j + \sum_{k \neq 0} \beta_{u,edu}^k d_{edu}^k) \cdot u_{ct} + \dots
 \end{aligned} \tag{2}$$

In this formulation, the coefficients β_p^0 and β_u^0 refer to people belonging to the base category (lowest income category, $j = 0$, and lowest education category, $k = 0$). The variables d_{inc}^j are income category dummies that take the value 1 if people belong to income category $j \neq 0$ and the value 0 otherwise. The variables d_{edu}^k are education category dummies that take the value 1 if people belong to education category $k \neq 0$ and the value 0 otherwise. The coefficients $\beta_{p,inc}^j, j \neq 0$, indicate by how much the effect of inflation for a person from income group $j \neq 0$ and the lowest education category differs from the effect for a person with lowest income and lowest education. The absolute effect for a person from income category $j \neq 0$ and the lowest education category is $\beta_p^0 + \beta_{p,inc}^j$. The coefficients $\beta_{p,edu}^k, k \neq 0$, indicate by how much the effect of inflation for a person from education category $k \neq 0$ and the lowest income category differs from the effect for a person with lowest income and lowest education. The absolute effect for a person from the education category $k \neq 0$ and the lowest income category is $\beta_p^0 + \beta_{p,edu}^k$. The coefficients for unemployment ($\beta_u^0, \beta_{u,inc}^j, \beta_{u,edu}^k$) are to be interpreted in an analogous way.

When we consider income as the *only* conditioning variable (which is our basic version of the interaction model), the base category refers to persons from the lowest income category without regard to the education level, and the coefficients $\beta_{p,inc}^j$ and $\beta_{u,inc}^j$ capture

the difference from that base category. When we jointly consider *more than two* attributes as conditioning variables, the base category and its associated coefficient refer to one particular configuration of those attributes and the other coefficients must be interpreted relative to that base category.

There has been some debate in the literature on whether life satisfaction should be treated as a cardinal phenomenon. If not, an ordered discrete choice model should be estimated rather than a linear regression model. Research that has applied both approaches has found little difference between the results of a linear regression and an ordered logit or probit (Ferrer-i-Carbonell and Frijters 2004). To facilitate interpretation, we use least squares as the primary method and an ordered probit as a robustness check. We report heteroskedasticity robust standard errors, corrected for clustering at the country-year level.

4. Empirical Results

4.1 Inflation Aversion by Income

Table 2 reports estimation results on the relationship between life satisfaction and the rates of inflation and unemployment and on how these relationships vary with income. The table focuses on the main relationships; more detailed estimation results are presented in Table A2 in the Appendix.⁷

Regression 1 is the empirical counterpart to eq. (1) stated in subsection 3.2. In line with previous literature, life satisfaction is monotonically and significantly increasing with income. People in the “high income” class are 0.79 points more satisfied on the 10-point life

⁷ With respect to the individual-level socio-demographic variables, all our regressions yield the same qualitative results, and these results are consistent with common findings for developed countries (see, e.g., Frey and Stutzer 2002): positive and significant coefficients on being female, being married or living together; negative and significant coefficients on being unemployed and on being divorced, separated or widowed; life satisfaction first decreasing then increasing in age (with turning point in the late 40s). In quantitative terms, large differences exist between being married and being divorced (about 0.62 on a 10-point scale) and between being (full-time) employed and being unemployed (0.85). The annual growth rate of GDP has a significant positive coefficient; per capita GDP is insignificant. See Table A2 in the Appendix. Since the results on socio-demographic variables are qualitatively the same in all subsequent regressions, they will not be shown in the corresponding results tables.

satisfaction scale than are people in the “low income” class. To illustrate in terms of personal life events, this difference quantitatively corresponds to the effect of becoming unemployed (see footnote 7). Also in line with previous findings, the levels of inflation and unemployment affect life satisfaction negatively and statistically significantly. A 1-percentage point increase in the inflation rate reduces life satisfaction of an average person by 0.012 points on the 10-point scale, whereas a 1-percentage point increase in the unemployment rate reduces life satisfaction by 0.032 points. To illustrate, the latter figure corresponds to about one twentieth of the effect of a divorce. The ratio of the two coefficients, which is 0.375, is in the range found in previous SWB studies and similar to values for average relative inflation aversion from stated preference studies (see Table 1).

Regression 2 differentiates the relationships between life satisfaction and the rates of inflation and unemployment by income. It is seen that not just the average individual (as in regression 1) but people from all income classes are negatively and statistically significantly affected by both inflation and unemployment. The effect of inflation is monotonically decreasing in income. The effect sizes in all of the upper three income classes are significantly smaller than the effect in the bottom income class. In the top income class it is less than half as large as in the bottom class and only weakly significantly different from zero.

As to unemployment, its effect also tends to be smaller at higher income, but the income dependence is less pronounced quantitatively than it is in the case of inflation. The effect of unemployment on life satisfaction is about 75 percent as large in the upper three income classes as it is in the bottom income class, but this difference is insignificant for the Upper middle income and high income class and only weakly significant for the lower middle income class ($p = 0.063$).

Since the coefficients on inflation and unemployment are significantly different from zero in all income classes, it is meaningful to compute their ratios. As in the case of the average person (regression 1), we will take these ratios as an indicator of relative inflation

aversion. As shown at the bottom of Table 2, relative inflation aversion is similar in the two bottom income classes, but considerably smaller in the top income class (amounting to about 60 percent).

It is instructive to compare the coefficients on income in regressions 1 and 2. While (as stated above) a person in the high income category is 0.79 points more satisfied than a person in the low income category according to regression 1, this difference reduces to 0.64 in regression 2. A considerable fraction of the well-being effect of higher income thus reflects high income individuals' smaller sensitivity to inflation and the risk of unemployment.

In comparison with previous literature, we can state that, in line with what was found by Easterly and Fischer (2001) in a stated preference exercise, our experience based approach suggests that absolute inflation aversion is decreasing in income. In contrast, however, to the stated preference results of Scheve (2004) and Jayadev (2006), not just absolute inflation aversion but also relative inflation aversion is less pronounced among the relatively well-off than among the less well-off.

According to these results, relatively rich people are not only better off due to the direct life satisfaction effect of income, but also because they are less affected by inflation. As a consequence, anti-inflation policy benefits the non-rich more than it benefits the rich.

In regressions 1 and 2 we controlled for individual unemployed status along with other socio-demographic characteristics and found a considerable effect on life satisfaction of being individually unemployed (cf. footnote 7). To the extent that being unemployed is correlated with income, controlling for individual unemployment may bias the results in regression 2 concerning the income dependence of unemployment aversion. In particular, if the propensity to be unemployed is higher in the low-income category, people with low income may in fact be more unemployment averse than people in higher income categories even if regression 2 does not support a significant difference.

To check for this possibility, we ran versions of regressions 1 and 2 that do not control for employment status. As reported in Table A3 in the Appendix, this modification leads to higher coefficients for the coefficients on the unemployment rate in comparison with regressions 1 and 2. It does not, however, imply that people from higher income groups are monotonically and significantly less averse to higher unemployment rates than are people from low income groups. As in regression 2, the effect of general unemployment on life satisfaction is smaller in the upper three income classes than in the bottom income class, but this difference remains insignificant for the Upper middle income and high income class. For the lower middle income class, the difference is now significant at $p = 0.047$. The effects of inflation are unchanged in comparison with regressions 1 and 2.

Since omission of personal unemployment has little effect on the results of interest and would be an arbitrary truncation of the set of demographic variables usually included in life satisfaction regressions, we will continue to use personal unemployment as a socio-demographic control in the remainder of the paper.

4.2 Inflation Aversion by Income and Education Level

For 58 out of 77 country-year clusters we have data on people's education level ('some primary education', 'some secondary education', 'at least some university education'). This allows us to study whether inflation and unemployment aversion vary not just with income but also with education.

Table 3 presents life satisfaction regressions based on this restricted sample, with education as an additional explanatory variable. Regression 3 is the analog to regression 1 in Table 2. It is seen that life satisfaction increases monotonically in income, with coefficients very similar to those in regression 1. Life satisfaction also increases in the education level, but the coefficient on 'some secondary education' is not significantly different from that on the omitted category 'some primary education' whereas the coefficient for 'at least some

university education' (tertiary education) is weakly significantly greater ($p = 0.063$). The coefficient on inflation is approximately of the same magnitude as in regression 1, whereas the coefficient on the unemployment rate is now almost two thirds larger.

Regression 4 is the analog to regression 2 in Table 2. This regression confirms all of the qualitative findings from regression 2: Inflation aversion decreases monotonically and significantly in income whereas there is no significant variation of unemployment aversion by income.

Regression 5 differentiates inflation and unemployment aversion by education level instead of income. Whereas the base category in regression 4 consists of persons with low income, disregarding their education level, the base category in regression 5 consists of persons with only primary education, disregarding their income. It is seen that inflation aversion is significantly greater in people with secondary education and weakly significantly greater ($p = 0.055$) in people with university education than in people that have only primary education. Unemployment aversion, conversely, monotonically decreases in the education level, with a statistically significant difference between persons with university education and persons with primary education only.

In regression 6 we combine the differentiation by income with that by education. The reference group now consists of people with low income and only primary education. This regression confirms the results from regressions 4 and 5: Inflation aversion decreases with income and increases with the education level. Unemployment aversion is unaffected by income and decreases in the education level. This suggests that the dimensions income and education have independent effects on the aversion towards inflation and unemployment.

As to relative inflation aversion, its average value is somewhat smaller in regression 3 than in regression 1, and is decreasing in income according to regression 4, as it is according to regression 2. As seen in regression 5, relative inflation aversion is substantially greater for people with secondary and university education than for people with primary education only.

Regression 6, which includes interactions of inflation and employment with both income and education, confirms the results from regressions 4 and 5 that relative inflation aversion decreases in income and increases in the education level.

4.3 Robustness Checks

The stated-preference studies discussed in section 2 included age, being unemployed, and being female as controls in order to check whether it is in fact income, rather than other factors, which affects inflation aversion. We conducted similar robustness checks by including interactions of the rates of inflation and unemployment with those three attributes in addition to the interaction with income. These regressions are based on the large sample with 77 country-year clusters.

Regression 7 in Table 4 focuses on income and age. The base category consists of persons with low income under the age of 20. It is seen that, relative to this base group, inflation aversion decreases in income and becomes insignificant for people from the top two income groups. With respect to age dependence, we see that people in their 30s, 40s and 60s are significantly more inflation averse than the other age groups.

In contrast to inflation aversion, unemployment aversion is insignificant for the base group, and it remains to be so at higher income levels. With increasing age (instead of increasing income), unemployment aversion is significant for people in their 40s and older. Whereas inflation aversion is highly dependent on income, unemployment aversion is highly dependent on age. This probably reflects the relatively poor employment prospects of older persons.⁸

Regression 8 focuses on income and a person's actual employment status. The base category consists of persons with low income who are not unemployed. It is seen that neither inflation aversion nor unemployment aversion are affected by being unemployed. The

⁸ Interestingly, unemployment aversion is greatest for people above 70 years of age. This might reflect the circumstance that notoriously high rates of unemployment tend to imply low levels of old-age pensions.

aversion towards the phenomenon of general unemployment is thus the same, no matter whether it reflects the fear of getting laid off (if employed) or the fear of not finding a job (if unemployed). The results concerning the income dependence of inflation and unemployment aversion from regression 2 are preserved.

Regression 9 examines the income dependence jointly with the dependence on sex. The base category consists of men with low income. It is found that inflation aversion is less pronounced in women than in men whereas unemployment aversion does not vary significantly with sex. Results on income dependence are as in regression 2.

Regression 10 investigates the income dependence, the age dependence, the dependence on the employment status, and the dependence on sex jointly. The base category consists of men under the age of 20 with low income who are not unemployed. The results of this combined exercise are qualitatively the same as in regressions 7 through 9.

The overall message from these checks is that the basic results from regression 2 are robust to the inclusion of age, unemployed status, and sex: Inflation aversion is decreasing in income whereas unemployment aversion displays no systematic income dependence. However, unemployment aversion strongly increases in age.

In addition to the robustness with respect to including additional control variables, we checked the robustness with respect to the estimation method and the coding of the income groups. Table A4 in the Appendix presents the results of these checks. Regression 11 is the counterpart to regression 2, estimated by means of an ordered probit maximum likelihood estimator instead of least squares. This check confirms that both absolute and relative inflation aversion decrease with income, whereas no systematic variation of unemployment aversion with income can be found. This also holds when we use dummy variables for 10 instead of four income categories (regression 12) and when we code income as an integer-valued numerical variable that runs from 1 to 10 (regression 13). The precision of the estimates is, however, lower when using 10 instead of four income categories.

4.4 Summary and Discussion

Table 5 offers a summary of our main qualitative findings in comparison with earlier literature.

With respect to absolute inflation aversion, our result of a negative relationship to income is consistent with the findings of Easterly and Fischer (2001), whereas our finding of a positive relationship to the education level is in contrast to their result.

Our result that relative inflation aversion decreases in income is the consequence of the negative relationship between absolute inflation aversion and income and the lack of a systematic relationship between absolute unemployment aversion and income. This result for relative inflation aversion stands in contrast to the evidence found by Scheve (2004) and Jayadev (2006) that relative inflation aversion increases in income. Our result that relative inflation aversion is greater among the better educated is in agreement with Jayadev (2006).

In trying to understand the reasons for the divergence of some of the results of this study from earlier papers, it should be recalled that those earlier studies were based on a stated-preference methodology, which tries to elicit people's attitudes towards inflation from explicit survey questions. Those attitudes are a mixture of several elements. First they reflect inflation's direct effects on people's personal well-being through higher prices. Second, they reflect people's perception of how inflation affects their personal well-being indirectly, through sophisticated details of the tax system. Third, they incorporate people's understanding of the general economic effects of inflation. Finally, the assessment of whether inflation or unemployment is more detrimental (relative inflation aversion) may be related to ideological preferences. Overall, stated attitudes towards inflation are the result of rather complicated cognitive processes that may be subject to several sorts of biases (Kahneman and Sugden 2005).

In comparison with the stated-preference approach, the experience-based approach to preference elicitation is cognitively less demanding. In particular, it does not require that people are consciously aware of complex cause-effect relationships. In addition, it does not rely on ideas of the effects of inflation (relative to unemployment) that are subject to ideology: All that matters for the experience-based approach is the statistical association between subjective well-being and the rate of inflation. This correlation captures all channels through which inflation affects well-being, whether cognitive or other.

Our findings concerning the dependence of inflation aversion on income and on the education level seem to be related to different transmission channels. On the one hand, the decrease of inflation aversion with income may reflect that less wealthy individuals are more affected by increases in the cost of living. In this vein, Easterly and Fischer (2001) found that high inflation tends to lower the real wages of the poor, while tending to increase poverty. On the other hand, the increase of inflation aversion (both absolute and relative) with better education may reflect a better understanding of the taxation-related effects of inflation or of the more indirect effects on the economy overall.

While we view the experience-based approach to studying social preferences as a promising addition to the methodological toolbox, a few caveats should be kept in mind. First, as always in empirical work, it is important to check whether effects attributed to one variable might not in fact be biased by the omission of correlated variables. In the current case, we checked the robustness of the income dependence of inflation aversion by including those controls that have also been considered in stated-preference studies (education level, age, unemployed status, and being female) and found our qualitative results robust to these checks.

Second, and more specific to this approach, subjective well-being data need to satisfy conventional quality standards of internal consistency, reliability, and validity in order to be useful for statistical work. These properties of the data are supported by an extensive validation literature (for a review see, e.g., Frey and Stutzer 2002). As to the issue of

cardinality of the data, our robustness check of using an ordered probit instead of least squares showed that assuming ordinality or cardinality of well-being scores has little effect on empirical results (for a more general assessment see Ferrer-i-Carbonell and Frijters 2004).

5. Conclusions

Studies of the macroeconomic correlates of subjective well-being have produced robust evidence that both inflation and unemployment have negative impacts on people's well-being, but have not differentiated these impacts according to people's income or, more generally, their socio-economic status. Studies on people's stated attitudes towards inflation, on the other hand, found that the poor are more likely than the non-poor to mention inflation as a top national concern (they are more absolutely inflation averse), but that they are less likely than the non-poor to prefer that inflation be controlled rather than unemployment (they are less relatively inflation averse).

This paper has used subjective well-being data of more than 91,000 individuals in 30 OECD countries, 1990-2008, to study how the well-being effects of inflation and unemployment (and hence the implicit aversion towards inflation and unemployment) vary with income and other socio-economic characteristics. While absolute inflation aversion decreases with income, it increases with the education level. Absolute unemployment aversion, conversely, does not vary systematically with income, but decreases with the education level and increases with age. Together, these results imply that the poor are not only more absolutely inflation averse, but that they are also more relatively inflation averse than the rich, contrary to results from stated preference studies. The differing results concerning the roles of income and education suggest that different dimensions of being disadvantaged influence the well-being effects of inflation and unemployment in different ways. In particular, being poor makes people more vulnerable to inflation, whereas being uneducated makes them more vulnerable to unemployment.

Our findings are important because they suggest that anti-inflation policy is more pro-poor than is anti-unemployment policy. High levels of unemployment hurt the disadvantaged not because they are poor but because (and to the extent that) they are less well educated. A policy that aims to help the disadvantaged should therefore include measures to combat inflation and to enhance education.

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Table 1: Survey of related literature

<i>Method</i>	<i>Study</i>	<i>Average relative inflation aversion</i>	<i>Absolute inflation aversion differing by...</i>	<i>Relative inflation aversion differing by...</i>	<i>Additional explanatory variables</i>
Stated preference	Easterly and Fischer 2001	0.71 ^{a)}	Income: decreasing in income		Education, occupational group, age, sex
	Scheve 2004	0.39 ^{b)}		Income: increasing in income	Education, unemployed status, age, sex
	Jayadev 2006	0.41 ^{c)}		Income: increasing in income	Education, unemployed status, age, sex
	Jayadev 2008	0.41 ^{d)}		Class: increasing in class	Income, unemployed status, age, sex
Experience-based	Di Tella et al. 2001	0.43 – 0.70 ^{e)}			
	Di Tella et al. 2003	0.52 ^{f)}			GDP per capita, benefit replacement rate
	Wolfers 2003	0.21 ^{g)}			Fluctuations in inflation and unemployment
	Welsch 2011	0.50 – 0.96 ^{h)}			GDP growth, GDP per capita
	This study	0.38	Income: decreasing in income	Income: decreasing in income	GDP growth, GDP per capita, education, unemployed status, age, sex

a) Percentage of respondents that mention inflation as a top national concern divided by percentage that mention recession and unemployment as a top national concern (Easterly and Fischer 2001, Table 1); b) percentage of respondents that give priority to combating inflation rather than unemployment (Scheve 2004, Table 1); c) percentage of respondents that give priority to combating inflation rather than unemployment (Jayadev 2006, Table 1); d) percentage of respondents that give priority to combating inflation rather than unemployment (Jayadev 2008, Table 1); e) ratio of coefficients on inflation and unemployment (Di Tella et al. 2001, Table 1, regressions (1) and (2)); f) ratio of coefficients on inflation and unemployment (Di Tella et al. 2003, Table 10, regression (1)); g) ratio of coefficients on inflation and unemployment (Wolfers 2003, Tables 1 and 4, micro data); h) ratio of coefficients on inflation and unemployment (Welsch 2011, Table 3, regression 2 and Table A2, regression 4).

Table 2: Main estimation results

	<i>Regression 1</i>		<i>Regression 2</i>		
	<i>coefficient</i>	<i>t-value</i>	<i>coefficient</i>	<i>t-value (different from low income)</i>	<i>t-value (different from zero)</i>
Low income	Omitted category		Omitted category		
Lower middle income	0.330	7.52	0.174	3.02	
Upper middle income	0.566	9.57	0.408	5.80	
High income	0.786	12.80	0.638	7.82	
Inflation rate	-0.012	3.63			
Inflation rate ^{a)}			-0.017		4.68
* Lower middle income			-0.012	3.10	3.56
* Upper middle income			-0.008	3.91	2.38
* High income			-0.008	2.77	1.78
Unemployment rate	-0.032	2.85			
Unemployment rate ^{a)}			-0.040		3.07
* Lower middle income			-0.028	1.89	2.34
* Upper middle income			-0.031	0.97	2.55
* High income			-0.032	0.82	2.63
Demographic variables	Yes		Yes		
Macro controls	Yes		Yes		
Observations	91195		91195		
R ²	0.133		0.134		
Relative inflation aversion (coefficient on inflation rate/coefficient on unemployment rate):					
Average	0.375				
Low income			0.425		
Lower middle income			0.429		
Upper middle income			0.258		
High income			0.250		

Dependent variable: 10-point life satisfaction. Method: OLS. Regressions include personal characteristics (age, age-squared, sex, civil status, number of children, employment status), macro controls (GDP growth, GDP per capita), wave dummies and region dummies. Robust t-values are corrected for clustering at the country-year level. Number of clusters: 77. a) base category = low income

Table 3: Estimation results with education level included (restricted sample)

	<i>Regression 3</i>		<i>Regression 4</i>			<i>Regression 5</i>			<i>Regression 6</i>		
	<i>coefficient</i>	<i>t-value</i>	<i>coefficient</i>	<i>t-value</i> <i>(different</i> <i>from base</i> <i>category)</i>	<i>t-value</i> <i>(different</i> <i>from zero)</i>	<i>Coefficient</i>	<i>t-value</i> <i>(different</i> <i>from base</i> <i>category)</i>	<i>t-value</i> <i>(different</i> <i>from zero)</i>	<i>coefficient</i>	<i>t-value</i> <i>(different</i> <i>from base</i> <i>category)</i>	<i>t-value</i> <i>(different</i> <i>from zero)</i>
Low income	Omitted category		Omitted category			Omitted category			Omitted category		
Lower middle income	0.302	5.62	0.143	2.31		0.307	5.50		0.162	2.66	
Upper middle income	0.553	7.42	0.385	4.29		0.556	7.25		0.430	5.01	
High income	0.780	9.98	0.660	6.75		0.783	9.91		0.728	7.67	
Primary Education	Omitted category		Omitted category			Omitted category			Omitted category		
Secondary Education	0.063	1.25	0.051	0.97		-0.047	0.50		-0.042	0.47	
Tertiary Education	0.108	1.89	0.096	1.58		-0.072	0.74		-0.068	0.77	
Inflation rate ^{a)}	-0.014	4.24	-0.019		5.39	-0.012		3.41	-0.017		4.61
*Lower middle income			-0.014	3.78	4.11				-0.010	4.45	2.77
*Upper middle income			-0.010	3.95	3.11				-0.005	4.47	1.23
*High income			-0.009	2.58	1.99				-0.003	3.35	0.49
*Secondary Education						-0.017	3.74	4.74	-0.024	6.15	6.69
*Tertiary Education						-0.014	1.96	4.09	-0.025	4.70	6.04
Unemployment rate ^{a)}	-0.053	3.93	-0.059		3.77	-0.066		4.49	-0.069		4.10
*Lower middle income			-0.048	1.45	3.47				-0.062	1.02	4.24
*Upper middle income			-0.050	0.74	3.30				-0.068	0.08	4.70
*High income			-0.056	0.25	4.13				-0.078	0.77	5.83
*Secondary Education						-0.047	1.53	2.94	-0.048	1.82	2.69
*Tertiary Education						-0.039	2.16	2.93	-0.037	2.88	2.33
Observations	66699		66699			66699			66699		
R ²	0.151		0.152			0.152			0.153		

Dependent variable: 10-point life satisfaction. Method: OLS. Regressions include personal characteristics (age, age-squared, sex, civil status, number of children, employment status), macro controls (GDP growth, GDP per capita), wave dummies and region dummies. Robust t-values are corrected for clustering at the country-year level. Number of clusters: 58. Education1 = some primary education; Education2 = some secondary education; Education3 = at least some university education. a) base category. The base categories for interaction terms are as follows: persons with low income (regression 4); persons with some primary education (regression 5); persons with low income and some primary education (regression 6).

Table 4: Robustness to control variables (full sample)

	Regression 7: Age			Regression 8: Unemployed			Regression 9: Female			Regression 10: All control variables		
	coefficient	t-value (different from base category)	t-value (different from zero)	coefficient	t-value (different from base category)	t-value (different from zero)	coefficient	t-value (different from base category)	t-value (different from zero)	coefficient	t-value (different from base category)	t-value (different from zero)
Low income												
Lower middle income	0.232	3.98		0.174	3.08		0.176	3.07		0.237	4.22	
Upper middle income	0.497	7.01		0.401	5.77		0.410	5.80		0.504	6.98	
High income	0.742	8.69		0.636	7.86		0.641	7.84		0.753	8.78	
Inflation rate ^{a)}	-0.014		3.56	-0.017		4.79	-0.020		4.66	-0.017		3.79
*Lower middle income	-0.009	2.93	2.51	-0.012	3.47	3.53	-0.016	3.03	4.20	-0.012	3.14	3.11
*Upper middle income	-0.005	3.68	1.41	-0.008	4.17	2.37	-0.012	3.65	3.30	-0.008	3.62	2.27
*High income	-0.004	2.68	1.09	-0.008	2.84	1.78	-0.011	2.64	2.73	-0.007	2.63	2.03
*Person in 20's	-0.015	0.88	4.36							-0.019	1.23	4.89
*Person in 30's	-0.020	5.59	4.76							-0.023	5.01	4.76
*Person in 40's	-0.019	4.36	4.86							-0.022	4.07	4.91
*Person in 50's	-0.014	0.32	3.22							-0.018	0.32	3.39
*Person in 60's	-0.019	1.95	4.87							-0.022	1.79	5.34
*Person in 70's	-0.016	0.50	3.39							-0.019	0.39	4.35
*Unemployed				-0.017	0.02	2.81				-0.016	0.24	2.46
*Female							-0.014	2.53	4.07	-0.010	2.66	2.88
Unemployment rate ^{a)}			0.08	-0.041		3.14	-0.037		2.72	0.005		0.32
*Lower middle income	-0.003	0.60	0.22	-0.028	1.93	2.36	-0.025	1.85	1.98	0.008	0.48	0.62
*Upper middle income	-0.005	0.37	0.35	-0.031	0.98	2.60	-0.028	0.93	2.28	-0.000	0.48	0.01
*High income	-0.007	0.56	0.54	-0.032	0.84	2.64	-0.029	0.76	2.36	-0.003	0.70	0.23
*Person in 20's	-0.012	1.01	0.84							-0.006	1.04	0.45
*Person in 30's	-0.021	2.11	1.63							-0.016	2.17	1.17
*Person in 40's	-0.028	2.64	1.90							-0.023	2.66	1.48
*Person in 50's	-0.035	3.13	2.29							-0.030	3.17	1.89
*Person in 60's	-0.058	4.32	4.02							-0.054	4.43	3.57
*Person in 70's	-0.068	5.46	4.09							-0.064	5.23	3.84
*Unemployed				-0.038	0.19	1.90				-0.006	0.73	0.29
*Female							-0.044	1.50	3.28	-0.003	1.50	0.17
Observations		91195			91195			91195			91195	
R ²		0.135			0.133			0.134			0.135	

Dependent variable: 10-point life satisfaction. Method: OLS. Regressions include personal characteristics, macro controls, wave dummies and region dummies. a) base category. The base categories are as follows: persons with low income below the age of 20 (regression 7), persons with low income who are not unemployed (regression 8), men with low income (regression 9), men with low income below the age of 20 who are not unemployed (regression 10).

Table 5: Summary of main findings

	This study			Easterly and Fischer (2001)	Scheve (2004)	Jayadev (2006)
	Absolute inflation aversion	Absolute unemployment aversion	Relative inflation aversion	Absolute inflation aversion	Relative inflation aversion	Relative inflation aversion
Income	-	0	-	-	+	+
Education	+	-	+	-	0	+
Age	0	+	-	0	+	0
Unemployed	0	0	0	0	-	-
Female	-	0	-	0	-	-

A plus (minus) sign indicates a significant positive (negative) relationship. Zero (0) indicates lack of a significant relationship.

Appendix

Table A1. Summary statistics

Full Sample

	Observations	Mean	S.D.	Minimum	Maximum
Life Satisfaction	91195	7.2454	2.10399	1.00	10.00
Male	91195	.4838	.49974	.00	1.00
Female	91195	.5162	.49974	.00	1.00
Person in 10's	91195	.0319	.17561	.00	1.00
Person in 20's	91195	.1952	.39636	.00	1.00
Person in 30's	91195	.2141	.41022	.00	1.00
Person in 40's	91195	.1960	.39700	.00	1.00
Person in 50's	91195	.1502	.35732	.00	1.00
Person in 60's	91195	.1237	.32919	.00	1.00
Person in 70's	91195	.0889	.28453	.00	1.00
Single	91195	.2058	.40427	.00	1.00
Married	91195	.6015	.48959	.00	1.00
Living together	91195	.0548	.22760	.00	1.00
Divorced	91195	.0512	.22049	.00	1.00
Separated	91195	.0171	.12950	.00	1.00
Widowed	91195	.0696	.25451	.00	1.00
Number of children	91195	1.8117	1.60990	.00	20.00
Employed	91195	.9456	.22689	.00	1.00
Unemployed	91195	.0544	.22689	.00	1.00
Low income	91195	.2156	.41123	.00	1.00
Lower middle income	91195	.2825	.45022	.00	1.00
Upper middle income	91195	.2334	.42301	.00	1.00
High income	91195	.2685	.44318	.00	1.00
Growth rate	91195	3.0569	2.69201	-5.70	10.65
GDP per capita	91195	21816.3565	7906.98462	7458.39	49921.32
Inflation rate	91195	8.5190	16.10201	-.71	80.41
Unemployment rate	91195	7.7453	3.97755	1.76	22.96
Scandinavia	91195	.1342	.34083	.00	1.00
Western Europe	91195	.4290	.49494	.00	1.00
Eastern Europe	91195	.1711	.37659	.00	1.00
America	91195	.1565	.36333	.00	1.00
Asia	91195	.0644	.24551	.00	1.00
Pacific	91195	.0448	.20690	.00	1.00
Wave 1	91195	.2583	.43773	.00	1.00
Wave 2	91195	.1923	.39412	.00	1.00
Wave 3	91195	.3441	.47508	.00	1.00
Wave 4	91195	.2052	.40386	.00	1.00
Valid Observations	91195				

Restricted Sample

	Observations	Mean	S.D.	Minimum	Maximum
Life Satisfaction	66699	7.1866	2.15552	1.00	10.00
Male	66699	.4807	.49963	.00	1.00
Female	66699	.5193	.49963	.00	1.00
Person in 10's	66699	.0320	.17611	.00	1.00
Person in 20's	66699	.1936	.39513	.00	1.00
Person in 30's	66699	.2135	.40980	.00	1.00
Person in 40's	66699	.1978	.39835	.00	1.00
Person in 50's	66699	.1511	.35815	.00	1.00
Person in 60's	66699	.1215	.32669	.00	1.00
Person in 70's	66699	.0904	.28679	.00	1.00
Single	66699	.2127	.40923	.00	1.00
Married	66699	.5908	.49168	.00	1.00
Living together	66699	.0544	.22674	.00	1.00
Divorced	66699	.0564	.23073	.00	1.00
Separated	66699	.0180	.13287	.00	1.00
Widowed	66699	.0677	.25119	.00	1.00
Number of children	66699	1.8187	1.63485	.00	20.00
Primary Education	66699	.2644	.44099	.00	1.00
Secondary Education	66699	.4983	.50000	.00	1.00
Tertiary Education	66699	.2374	.42548	.00	1.00
Employed	66699	.9395	.23846	.00	1.00
Unemployed	66699	.0605	.23846	.00	1.00
Low income	66699	.2225	.41593	.00	1.00
Lower middle income	66699	.2832	.45053	.00	1.00
Upper middle income	66699	.2336	.42310	.00	1.00
High income	66699	.2608	.43907	.00	1.00
Growth rate	66699	3.0094	2.88958	-5.70	10.65
GDP per capita	66699	22031.6074	8818.37942	7458.39	49921.32
Inflation rate	66699	9.4035	18.26738	-.71	80.41
Unemployment rate	66699	7.8078	3.86597	2.01	22.96
Scandinavia	66699	.1373	.34420	.00	1.00
Western Europe	66699	.3520	.47759	.00	1.00
Eastern Europe	66699	.2295	.42053	.00	1.00
America	66699	.1558	.36263	.00	1.00
Asia	66699	.0652	.24683	.00	1.00
Pacific	66699	.0602	.23793	.00	1.00
Wave 1	66699	.0104	.10133	.00	1.00
Wave 2	66699	.2462	.43080	.00	1.00
Wave 3	66699	.4642	.49872	.00	1.00
Wave 4	66699	.2793	.44864	.00	1.00
Valid Observations	66699				

Table A2. Detailed estimation results (regressions 1 and 2 from Table 2)

	<i>Regression 1</i>		<i>Regression 2</i>		
	<i>coefficient</i>	<i>t-value</i>	<i>coefficient</i>	<i>t-value (different from base category)</i>	<i>t-value (different from zero)</i>
Male	Omitted category		Omitted category		
Female	0.112	3.22	0.110	3.25	
Person 10's	Omitted category		Omitted category		
Person 20's	-0.171	4.75	-0.172	4.83	
Person 30's	-0.425	9.09	-0.426	9.05	
Person 40's	-0.588	10.94	-0.589	11.00	
Person 50's	-0.544	9.92	-0.547	10.09	
Person 60's	-0.258	3.52	-0.267	3.74	
Person 70's	-0.111	1.31	-0.127	1.56	
Single	Omitted category		Omitted category		
Married	0.407	10.49	0.414	10.91	
Living together	0.145	2.48	0.152	2.62	
Divorced	-0.228	4.28	-0.235	4.35	
Separated	-0.584	8.16	-0.588	8.17	
Widowed	-0.148	3.07	-0.152	3.11	
Number of children	0.005	0.41	0.009		0.75
Employed	Omitted category		Omitted category		
Unemployed	-0.848	10.64	-0.849	10.69	
Scandinavia	Omitted category		Omitted category		
Western Europe	-0.488	4.71	-0.484	4.68	
Eastern Europe	-1.011	4.76	-1.012	4.77	
America	-0.060	0.61	-0.061	0.62	
Asia	-1.556	11.48	-1.552	11.64	
Pacific	-0.374	2.17	-0.375	2.16	
Wave 1	Omitted category		Omitted category		
Wave 2	-0.004	0.04	0.001	0.01	
Wave 3	-0.034	0.35	-0.024	0.24	
Wave 4	0.106	0.88	0.112	0.93	
Growth rate	0.041	3.61	0.039		3.31
GDP per capita	$-1.48 \cdot 10^{-6}$	0.27	$-1.15 \cdot 10^{-6}$		0.21
Low income	Omitted category		Omitted category		
Lower middle income	0.330	7.52	0.174	3.02	
Upper middle income	0.566	9.57	0.408	5.80	
High income	0.786	12.80	0.638	7.82	
Inflation rate	-0.012	3.63			
Inflation rate ^{a)}			-0.017		4.68
* Lower middle income			-0.012	3.10	3.56
* Upper middle income			-0.008	3.91	2.38
* High income			-0.008	2.77	1.78
Unemployment rate	-0.032	2.85			
Unemployment rate ^{a)}			-0.040		3.07
* Lower middle income			-0.028	1.89	2.34
* Upper middle income			-0.031	0.97	2.55
* High income			-0.032	0.82	2.63
Observations	91195		91195		
R ²	0.133		0.134		

Dependent variable: 10-point life satisfaction. Method: OLS. Robust t-values are corrected for clustering at the country-year level. Number of clusters: 77. a) base category = low income

Table A3: Regression results without individual unemployed status.

	<i>Regression 1A</i>		<i>Regression 2A</i>		
	<i>coefficient</i>	<i>t-value</i>	<i>coefficient</i>	<i>t-value (different from low income)</i>	<i>t-value (different from zero)</i>
Low income	Omitted category		Omitted category		
Lower middle income	0.372	8.19	0.208	3.62	
Upper middle income	0.626	10.42	0.452	6.43	
High income	0.866	13.97	0.690	8.54	
Inflation rate	-0.012	3.51			
Inflation rate ^{a)}			-0.017		4.48
* Lower middle income			-0.012	2.85	3.41
* Upper middle income			-0.008	3.64	2.32
* High income			-0.008	2.66	1.78
Unemployment rate	-0.036	3.19			
Unemployment rate ^{a)}			-0.046		3.53
* Lower middle income			-0.033	2.02	2.69
* Upper middle income			-0.035	1.21	2.82
* High income			-0.034	1.18	2.75
Demographic variables	Yes		Yes		
Macro controls	Yes		Yes		
Observations	91195		91195		
R ²	0.125		0.125		
Relative inflation aversion (coefficient on inflation rate/coefficient on unemployment rate):					
Average	0.333				
Low income			0.370		
Lower middle income			0.363		
Upper middle income			0.229		
High income			0.235		

Dependent variable: 10-point life satisfaction. Method: OLS. Regressions include personal characteristics (age, age-squared, sex, civil status, number of children), macro controls (GDP growth, GDP per capita), wave dummies and region dummies. Robust t-values are corrected for clustering at the country-year level. Number of clusters: 77. a) base category = low income

Table A4: Robustness to estimation method and income measurement

Regression 11 (ordered probit)				Regression 12 (least squares)				Regression 13 (least squares)		
	coefficient	t-value (different from base category)	t-value (different from zero)		coefficient	t-value (different from base category)	t-value (different from zero)		coefficient	t-value
Inflation				Inflation				Inflation	-0.019	4.48
*LowIncome	-0.008		4.54	*Income1	-0.019		3.78	Inflation*Income	0.002	2.39
*LowerMiddleIncome	-0.006	3.17	3.27	*Income2	-0.017	0.68	4.86			
*UpperMiddleIncome	-0.004	3.69	2.34	*Income3	-0.012	1.67	3.46			
*HighIncome	-0.004	2.31	1.84	*Income4	-0.012	1.95	3.44			
				*Income5	-0.007	2.83	1.88			
				*Income6	-0.011	1.94	3.07			
				*Income7	-0.008	2.20	1.74			
				*Income8	-0.008	2.01	1.82			
				*Income9	-0.006	2.22	1.34			
				*Income10	-0.007	1.81	1.34			
Unemployment rate				Unemployment				Unemployment	-0.039	2.72
*LowIncome	-0.022		3.20	*Income1	-0.048		2.76	Unemployment*Income	0.002	1.01
*LowerMiddleIncome	-0.018	1.24	2.67	*Income2	-0.036	1.08	3.12			
*UpperMiddleIncome	-0.020	0.52	2.85	*Income3	-0.030	1.58	2.37			
*HighIncome	-0.021	0.20	3.04	*Income4	-0.028	1.86	2.38			
				*Income5	-0.026	1.80	2.06			
				*Income6	-0.039	0.66	2.98			
				*Income7	-0.035	0.91	2.77			
				*Income8	-0.029	1.25	2.10			
				*Income9	-0.032	1.09	2.33			
				*Income10	-0.021	1.67	1,28			
Observations	91195			Observations	91195			Observations	91195	
Pseudo R ²	0.032			R ²	0.135			R ²	0.134	
Relative inflation aversion				Relative inflation aversion						
LowIncome	0.364			Income1	0.396	Income6	0.282			
LowerMiddleIncome	0.333			Income2	0.472	Income7	0.229			
UpperMiddleIncome	0.200			Income3	0.400	Income8	0.276			
HighIncome	0.190			Income4	0.429	Income9	0.188			
				Income5	0.269	Income10	0.333			

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