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HOW CERTAIN ARE DUTCH HOUSEHOLDS ABOUT FUTURE INCOME? AN EMPIRICAL ANALYSIS

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The precautionary saving literature shows that income uncertainty increases savings and wealth. To estimate the magnitude of this effect, we need a measure of income uncertainty. This paper empirically analyzes subjective income uncertainty in The Netherlands. Data come from a large Dutch household survey. We measure income uncertainty by asking questions on expected household income in the next twelve months. First, we describe the data and investigate the relationship between the measure of income uncertainty and a number of household characteristics. Controlling for information on expected income changes, we find strong relationships between labor-market characteristics and the subjective income uncertainty as reported by the heads of the households. Second, we compare income uncertainty in The Netherlands with income uncertainty in the U.S. and Italy. It becomes evident that perceived income uncertainty is smaller in The Netherlands than it is in the U.S.

1. INTRODUCTION

In the dynamic process of household decision making, expectations about the future play a central role. Common versions of the Life Cycle and Permanent Income Hypothesis models assert that current consumption depends not only on current wealth, income and preferences, but also on the individual's or household's subjective distribution of future income. On the basis of an empirical study, Carroll (1994) finds that, for fixed permanent income, current consumption is not influenced by predictable changes in future income. However, future income *uncertainty* has an important effect: consumers facing greater income uncertainty consume less.

In the literature on precautionary saving (see Kimball, 1990), several papers have addressed the theoretical result that consumers postpone their consumption when income becomes more uncertain. See, for example, Guiso *et al.* (1992), Banks *et al.* (1995), and Lusardi (1997). Portfolio decisions may also be affected by income uncertainty (Kimball, 1993). At an empirical level, this is illustrated by Guiso *et al.* (1996): the portfolio share of risky assets is inversely related to income risk.

Empirical studies that include income uncertainty face the problem of measuring the (subjective) uncertainty of future income. Some studies use simulations, but as noted by Guiso *et al.* (1992), simulations do not test whether people actually respond to risk as predicted by the theoretical models. Other studies estimate

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income uncertainty from panel data on income realizations (see, for example, Carroll and Samwick, 1997). Income changes are then regressed upon individual characteristics and the variance of the residuals is used as a proxy for income uncertainty. Next to assumptions about the expectation formation process, the researcher also assumes that he has the same information as the subjects in the sample, which is rather doubtful. For example, for many individuals yearly salary increases are fixed according to some scale that is known to the individual. Since these wage scales are different for each individual, the wage regression will not be able to explain these differences; the researcher thus observes income uncertainty, while there is in fact no uncertainty at all. The same occurs in the case of a woman who is pregnant and knows she will stop working in five months' time. Her income change is unpredictable in the wage regression, but there is no uncertainty about her income.

A lot of the variation in income changes is thus known to individuals, and is not at all uncertain. In practice, however, it will never be possible to obtain all the relevant information to measure the unpredictable part of income changes. An alternative way to measure income uncertainty is by asking questions about the individual's subjective distribution for income in the next year. This method is less popular among economists. The skepticism is based upon the assertion that people have no incentive to answer the questions carefully. Dominitz and Manski (1997), however, are right in arguing that if this is to be taken seriously, it should be applied to survey data on realizations and not merely to subjective data. Empirical economic analyses of household behavior routinely use self-reports on realized income, assets, employment, and other variables.

Instead of arguing that respondents have no incentive to answer questions about their expectations carefully, one could claim that respondents do not have the ability to answer these kinds of questions. A way to check this is by analyzing subjective data. Recent work on the subjective measurement of income expectations has indicated that survey data can provide useful information (see, for example, Dominitz and Manski, 1997, and Das and Van Soest, 1997, 1999). The latter show that the relations between answers to subjective survey questions on income expectations and various background variables are rather robust over time and have the expected signs.

This paper focuses on the measurement of subjective uncertainty about future income. First, we want to explore the quality of the data by showing descriptive results. We relate the estimated level of subjective income uncertainty to observed individual and household characteristics. These results give us an idea about the variables that influence income uncertainty. This information may yield some confidence in our measure of income uncertainty if we find plausible relationships, but it can also be used to predict income uncertainty in studies without direct information on income uncertainty. Second, we want to compare our results about income uncertainty in The Netherlands with the results of two other studies that measure uncertainty about future income. We use the study by Dominitz and Manski (1997, DM97 in the sequel) for information on income uncertainty in the U.S. and the study by Guiso *et al.* (1992) on income uncertainty in Italy.

The data we use come from the third wave of a large Dutch household survey: the CentER Panel Survey.[1] This is the first wave in which questions similar to the ones used by Dominitz and Manski were asked. These questions are concerned with the one-year-ahead income expectations on the household level and provide information about the level and uncertainty of the next year's household income. We find substantial variation in income uncertainty among households and show that it varies systematically with age, the level of past income, and other observed characteristics. Furthermore, upon comparing income uncertainty in The Netherlands with income uncertainty in the U.S. and Italy, our results suggest that income uncertainty in The Netherlands is smaller than it is in the U.S.[2]

The outline of the paper is as follows. Section 2 discusses the questions asked in the CentER Panel Survey to elicit information about subjective income uncertainty. Section 3 introduces the way in which we derive a measure of income uncertainty. Section 4 estimates a regression model for the location of the subjective income distribution and for the measure of income uncertainty. In Section 5, income uncertainty in The Netherlands is compared with income uncertainty in Italy and the U.S. Section 6 concludes.

2. Data from the CentER Panel Survey

The CentER Panel Survey (CPS) started in 1993. The survey method is completely computerized. Each household is provided with a personal computer and a modem. Questions and answers are transferred via the computer. If the respondent has questions or problems, he may call a help desk.

The first two waves of the CPS do not contain the questions we want to use, so we will concentrate on the third wave of the panel. These data were collected in 1995. The CPS consists of two parts. One part is designed to be representative of the whole Dutch population (the "representative panel"), the other part is a random sample of households in the upper 10 percent of the income distribution in The Netherlands (the "high-income panel"). The information in the data set can be divided into seven categories: household characteristics, accommodation, labor-market status and pension entitlements, health, income, assets and liabilities, and economic and psychological aspects of financial behavior. Our analysis draws heavily upon the following categories: household characteristics, income, and economic and psychological aspects of financial behavior. Since not all households participate in all questionnaires, we have 2,189 heads of households instead of the total of 2,574 heads of households pooled across all questionnaires.[3] A detailed description of the CPS is given in Nyhus (1996).

Within the set of questions we use, the respondents are first asked about the range in which their household income will fall in the next twelve months. The

[1]The CentER Panel Survey was formerly known as the VSB Panel, which was financially supported by the VSB Foundation.

[2]This conclusion, however, has to be drawn with caution since the survey questions may not be fully comparable because of different wording. Moreover, the sampling methods were not the same.

[3]The data set also contains information on other household members, but here we focus on the heads of the households.

precise wording of these questions is as follows:

> *What do you think is the LOWEST level your net household income could possibly be over the next twelve months?*

and

> *What do you think is the HIGHEST level your net household income could possibly be over the next twelve months?*

After answering these two questions, the respondents are asked to evaluate the probability (in percentage terms) with which their household income will fall below a certain level. Four questions of this type are asked, where the levels referred to in these questions are evenly spread over the interval ranging from the household's reported lowest possible income to its reported highest possible income.[4] The precise wording of the question is as follows:

> *How large do you think is the probability that the total net income of your household in the next twelve months will be below level$_k$? Please give a number between 0 and 100.*

The answers to these questions will be denoted by $PRO_1, \ldots, PRO_4$, and correspond to values of the subjective distribution function of the next year's household income.

The first difference between our data and the data from the Survey of Economic Expectations (SEE) used by DM97 is that the levels to which the questions in our data refer are evenly spread over the range of possible realizations of next year's household income, while the levels in the SEE questions are taken from a given sequence. Given the validity of the lowest and highest possible realizations, there will be no anchoring effect present in our data.[5] Given the mid-point between the lowest and highest possible income, DM97 select four values from a predetermined sequence of income thresholds in such a way that two thresholds are below and two thresholds are above the mid-point. This way of selecting thresholds avoids some anchoring problems, although it does not remove them completely. Respondents who are quite uncertain about their household income will see reasonable values for the thresholds, but if the head of the household is certain about the household income in the next twelve months, he will face rather low and high values for the thresholds, which might, in turn, induce him to spread his subjective density more widely.

The second difference between our data and the data from the SEE is that in the SEE, if a respondent gave an answer that was incompatible with the previous ones, this inconsistency was mentioned to the respondent. A new answer

[4]Evenly spread means that the level in question k ($k = 1, \ldots, 4$) is equal to: *lowest possible income* + $0.2k$ (*highest possible income* − *lowest possible income*).

[5]Anchoring means that a respondent adjusts his beliefs to the questions that are asked. If a respondent believes that the household income will never be below, say, Dfl. 40,000, he may still be induced to give positive probabilities to outcomes below this value. This can be the case if, for example, the levels that are referred to are all below this level of Dfl. 40,000. The reasoning of the respondent in this case is that his beliefs might be wrong (since the researcher seems to be interested in these low outcomes). The respondent might think that the values mentioned in the questions are objectively reasonable.

was then given. This way of questioning results in a higher fraction of valid answers, and will be pursued in the next wave of the CPS. For the current wave we will have to ignore the respondents who provided an inconsistent sequence of probabilities.

Unfortunately, the set of questions on income uncertainty is only presented to individuals who answered "yes" to the question "*Do you know, APPROXIMATELY, how much the NET INCOME of your household would amount to over 1994?*" In our sample, 769 (35 percent) of the heads of the households state that they do not know this. These respondents are mainly the less educated and females. The remaining 1,420 respondents all answered the question about the household's lowest and highest possible income for the next year. After deleting households with extremely low values for their income and a few households giving a higher value for the lowest possible income than for the highest possible income, 1,333 households remain with observed lowest and highest possible income levels for the next twelve months.

Following the questions on lowest and highest possible incomes, the heads of the households are asked to evaluate the probability with which their household income will fall below a certain level. Four questions of this type are asked, and, in theory, the probabilities provided by the respondents should result in a non-decreasing sequence of answers. This is not true for 198 of the heads of the households, while three heads of households do not answer the questions.[6] Due to some missing values for other household characteristics, our final sample consists of 1,122 individuals for which we observe all the information we need and for whom we can construct a subjective distribution for the next year's income.

The number of observations we finally use in the analysis is rather low compared to the number of observations in the original sample. This could be due to the fact that we are using subjective data and respondents may have difficulties or may show more resistance in answering this type of questions. The major reason for dropping out in our case, however, is caused by the question concerning realized income in the previous year, which is objectively measurable.

In Table 1 we present some descriptive statistics for the representative panel. In the calculation of these statistics we use weights to correct for the drop out of mainly the less educated and females.[7]

The numbers in Table 1 indicate that there is substantial variation in the respondents' answers to $PRO_1, \ldots, PRO_4$. Looking at the average or median answers to PRO_1 until PRO_4, we see that the subjective distribution of the next year's income is skewed to the left. Especially the top part of the interval (lowest income, highest income) contains a large probability mass. A table for the high-income panel shows similar answers to the probability questions, whereas the stated possible incomes are higher for the high-income panel, as could be expected. This suggests that if we condition on income, we do not need to distinguish between the two parts of the panel.

[6]The individuals that give answers that are incompatible with previous answers are mainly employed and less educated heads of households.

[7]The weights are constructed in such a way that the fractions of the less educated and of females in the final sample correspond to the fractions in the original representative panel.

TABLE 1

DESCRIPTIVE STATISTICS FOR THE ANSWERS TO THE QUANTITATIVE QUESTIONS FOR THE REPRESENTATIVE PART OF THE PANEL

	Lowest Income	Highest Income	PRO_1	PRO_2	PRO_3	PRO_4
Minimum	3,000	5,000	0	0	0	0
1st Quartile	26,400	31,668	0	10	20	40
Median	40,000	45,000	10	25	50	70
3rd Quartile	51,000	60,000	30	50	70	89
Maximum	185,000	358,000	100	100	100	100
Mean	39,261	45,408	20.2	33.1	47.4	60.4
Std. Dev.	20,222	24,874	24.8	28.2	30.3	31.0

Note: Income is measured in Dutch guilders (1 Dfl.≈0.5 U.S. Dollar).

3. MEASURING SUBJECTIVE INCOME UNCERTAINTY

We use as a measure of income uncertainty the ratio of the *interquartile range* (IQR) and the *median* (MED) of the subjective distribution of the next year's household income. The variation in income is thus measured relative to the location of the income distribution. A Dfl. 5,000 increase is a large change in income for a household with a low income, while it is only of minor importance for a household with a high income. A 10 percent increase in income, however, is likely to be significant for both a high-income and a low-income household.

We explicitly use the information on the reported lowest and highest possible incomes by putting all the probability mass on the reported interval. Furthermore, we assume that the density of the subjective income distribution is simply (piecewise) uniform over the intervals. We obtain an estimate of the cumulative distribution function by interpolation between the known points 0, $PRO_1, \ldots, PRO_4$, and 100. Given this estimated distribution, it is straightforward to compute the IQR and MED as measures of spread and location.

It would be interesting to know what the relationship is between the expected level of income and subjective income uncertainty. (The rank correlation between the IQR and MED is 0.43 and highly significant.) In case IQR is proportional to MED, the relative income uncertainty (IQR/MED) is constant (with respect to MED), which implies that households that expect a higher income next year do not perceive a greater or smaller *relative* uncertainty than other households. Using our data, we (nonparametrically) regress the quotient IQR/MED on MED. The result is presented in Figure 1. Together with the estimated functional relationship between IQR/MED and MED, we present 95 percent uniform confidence bounds.[8]

Figure 1 shows that the median of the subjective income distribution has no significant effect on relative income uncertainty as perceived by the head of the household. This result supports the approach taken in the studies by Skinner (1988), Zeldes (1989), and Carroll (1992), where the household's subjective IQR is assumed to be proportional to the median.

[8]We use the quartic kernel and a bandwidth equal to 1.5×10^4. For details on nonparametric regression, see e.g. Härdle and Linton (1994).

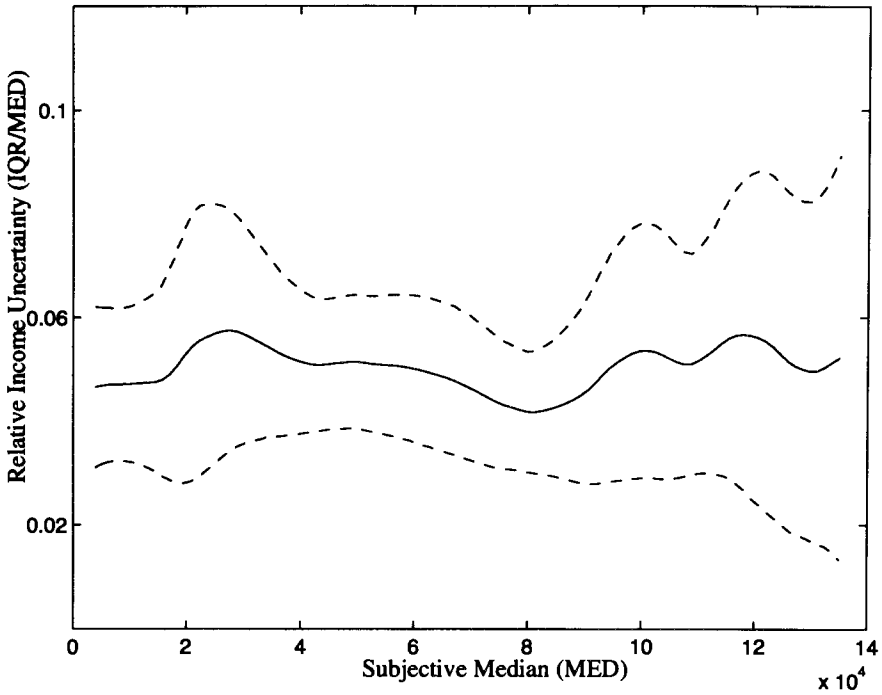

Figure 1. Nonparametric Regression of Relative Subjective Income Uncertainty (IQR/MED) on the Subjective Median of Future Income (MED). The Dashed Lines are 95 percent Uniform Confidence Bands.

4. Prediction of the Subjective Measure of Income Uncertainty

The previous section showed that our measure of income uncertainty does not vary systematically with the level of expected income. This analysis, however, used only MED as an explanatory variable. In this section we examine how our measure of income uncertainty varies with some other household characteristics. A (possible) correlation could yield useful information. First, if a relationship exists, this information might be useful for studies in which no subjective data are available, since our analysis then shows how one could proxy income uncertainty for each household. Second, if we find no correlation at all, this may cast doubt on our measure of income uncertainty based on the subjective data, especially in cases where a relationship between income uncertainty and household characteristics is plausible. Before we discuss the results for income uncertainty, we will examine the location of the subjective income distribution.

The Location of the Subjective Income Distribution

We estimate a model for the median of the subjective income distribution (as a measure of location) similar to the specification used by DM97. We allow for a more flexible age pattern than DM97 and we also distinguish between respondent and spouse with respect to labor-force participation.[9] The exact definitions

[9]We tested for the presence of a sample selection bias. The hypothesis that there was no sample selection bias could not be rejected.

of the explanatory variables can be found in the Appendix. We use LAD estimation to make our estimates robust to outliers, and bootstrapping to calculate the asymptotic covariance matrix. The reported standard errors are corrected for potential heteroskedasticity. Table 2 presents the estimation results.

The first column in Table 2 shows that household income in the past twelve months is a dominant predictor for expected household income in the next twelve months. A striking result is that the estimated coefficient is almost the same as found by DM97. The best linear prediction of the location measure of the subjective income distribution increases by 834 Dutch guilders with every one thousand guilders increase of past household income. There is a clear pattern for the education dummies, indicating that the higher educated expect a higher income (*ceteris paribus*), but none of dummies is significant.

TABLE 2

ESTIMATION RESULTS FOR THE MEDIAN OF THE SUBJECTIVE INCOME DISTRIBUTION

Dependent Variable: Median (in thousands of Dfl.)				
	Without Interactions		With Interactions	
Constant	7.58	(4.3)	10.7	(4.3)
PastInc	0.834	(0.021)	0.813	(0.036)
PastInc × DumWork			0.101	(0.045)
PastInc × DumWorkP			−0.115	(0.042)
DumWork	2.34	(0.74)	−2.11	(1.7)
DumWorkP	−1.84	(0.82)	3.44	(2.0)
DumUnem	−2.08	(0.79)	−1.79	(1.0)
DumUnemP	−0.277	(1.9)	−0.791	(1.5)
DumFemale	−0.969	(0.59)	−1.31	(0.73)
DumPartner	1.53	(0.76)	1.00	(0.87)
Age/10	−1.36	(1.4)	−1.79	(1.6)
$Age^2/100$	0.135	(0.13)	0.162	(0.15)
DumEdu2	0.772	(0.80)	0.210	(1.1)
DumEdu3	0.431	(0.89)	0.122	(1.2)
DumEdu4	1.58	(1.1)	1.54	(1.2)
DumEdu5	2.34	(1.2)	1.89	(1.7)
DumStartW	0.994	(1.9)	0.232	(1.7)
DumStopW	−4.57	(2.0)	−5.10	(2.1)
Average Abs. Dev.	15.8		15.7	

Note: Standard errors are in parentheses.

The first column of Table 2 also shows that differences exist between the head of the household and his/her partner in the effect of labor-market status on expected income. DM97 consider only the aggregate effect of labor force participation by respondent and spouse. They find no significant influence. Here we see, for example, that if the head of the household has a job, and a partner is present in the household, the difference in the median between a working and non-working partner is significant and almost Dfl. 2,000 (*ceteris paribus*).

The negative sign of the variable DumWorkP might be explained by the type of jobs (and the corresponding salary) partners have. This is best illustrated when we allow household income to interact with the employment dummies for head of the household and partner. The resulting estimates are presented in the second

column of Table 2. When we consider a household in which the head of the household has a paid job and the partner does not have a paid job, the coefficient on household income equals 0.914. For a household in which both the head of the household and the partner have a paid job, this coefficient is equal to 0.798. This suggests that the previous year's household income is less dominant in predicting the next year's household income when the partner has a paid job. Note that these results are conditional on whether or not the head of the household expects a household member to stop working. This expectation exerts a strong negative effect. The effect of a member of the household who is expected to start working is smaller and insignificant. The estimates for the parameters that are not related to labor market status are similar in the first and second column, so we will not discuss them separately.

Income Uncertainty

As we mentioned before, the ratio of IQR to MED will be used as our measure of income uncertainty. This measure looks at income changes relative to the level of income as measured by the median of the subjective distribution. We use the same model as in the analysis of the median. Instead of using the dummy variables corresponding to start/stop working (which proved to be insignificant), we incorporate a number of variables referring to expectations about income changes in the past and future. The variable PrevΔInc denotes the subjective change in household income over the last twelve months, and the variable ExpΔInc refers to the expected income change in the next twelve months (both variables are in percentage terms). The estimation results are presented in Table 3.

The results in the first column of Table 3 reveal that the household income over the past twelve months has a significant positive effect on the relative income uncertainty, although we could not reject proportionality between IQR and MED (see Figure 1). Note, however, that when the household income is (*ceteris paribus*) Dfl. 10,000 higher, the best linear prediction of the relative income uncertainty increases by less than 0.2 percentage points.[10] The effect is thus rather small.

When we look at the labor market status variables for head of household and partner, we see that if the partner has a job, this does not influence relative income uncertainty, whereas the fact that the head of the household has a job increases relative income uncertainty by almost one percentage point. The unemployment dummies for head of household and partner are of the same order of magnitude and are both significant. Females perceive less income uncertainty than males. We have also included a quadratic age pattern, in which income uncertainty reaches its minimum at the age of retirement. No clear pattern can be seen for the different educational levels, but a test on the joint significance of the dummy variables, corresponding to the level of education, indicates that differences do exist between educational levels (the significance probability equals 0.03).

When we include a number of characteristics of past and expected income changes, we obtain the results presented in the second column of Table 3. It turns

[10]We also included a quadratic term in past income, but this did not change the results, with the quadratic term being insignificant.

TABLE 3

ESTIMATION RESULTS FOR SUBJECTIVE INCOME UNCERTAINTY

	Dependent Variable 100*(IQR/MED)			
Constant	10.9	(2.0)	9.07	(2.6)
PastInc	0.0145	(0.0065)	0.0128	(0.0048)
DumWork	0.738	(0.21)	0.716	(0.40)
DumWorkP	−0.0852	(0.32)	0.0804	(0.40)
DumUnem	1.27	(0.65)	1.08	(0.61)
DumUnemP	1.78	(0.37)	1.45	(0.57)
DumFemale	−0.786	(0.35)	−0.731	(0.23)
DumPartner	−0.450	(0.42)	−0.451	(0.32)
Age/10	−3.50	(0.62)	−2.91	(0.82)
$Age^2/100$	0.280	(0.052)	0.235	(0.068)
DumEdu2	0.525	(0.32)	0.456	(0.27)
DumEdu3	0.603	(0.40)	0.559	(0.38)
DumEdu4	0.177	(0.26)	0.162	(0.29)
DumEdu5	0.713	(0.43)	0.651	(0.41)
PrevΔInc			0.0222	(0.040)
|PrevΔInc|			0.0321	(0.035)
ExpΔInc			0.0595	(0.047)
|ExpΔInc|			0.0984	(0.035)
Average Abs. Dev.	4.09		4.04	

Note: Standard errors are in parentheses.

out that only the absolute value of the expected income change (ExpΔInc) has a significant influence on income uncertainty: the larger the expected change, the more uncertain the head of the household will be about future income. We have included both the expected income change and its absolute value to see whether an expected increase in household income has a different effect from an expected decrease in household income. This, however, makes no difference. Also, past income changes have no significant effect. The effects of the other variables are the same as in the first column of Table 3. Only the variable DumUnem is no longer significant.

5. AN INTERNATIONAL COMPARISON

This section compares income uncertainty in the Netherlands with income uncertainty in Italy and the U.S. We do this by comparing the coefficients of variation of the subjective income distributions. For Italy, we use the results that are reported by Guiso *et al.* (1992). They use the biennial survey of the Bank of Italy [the Survey of Household Income and Wealth (SHIW)]. The SHIW elicits the subjective probability distributions for the growth rate of nominal labor earnings and pensions and for the rate of inflation over the next twelve months.[11]

[11]The exact wording of the SHIW question on the subjective probability distribution is: *We are interested in knowing your opinion about labor earnings or pensions twelve months from now. Suppose that you have 100 points to be distributed between these intervals* (a table is shown to the person interviewed). *Are there intervals which you definitely exclude? Assign zero points to these intervals. How many points do you assign to each of the remaining intervals?* For this, as well as a similar question on inflation uncertainty, the intervals of the table shown to the person interviewed are: >25, 20–25, 15–20, 13–15, 10–13, 8–10, 7–8, 6–7, 5–6, 3–5, 0–3, <0 percent. If it is less than zero, the person is asked: *How much less than zero? How many points would you like to assign to this class?* For further details on the Italian SHIW, see Guiso *et al.* (1992).

For the distribution of perceived income uncertainty in the U.S., we use the results of DM97.

The set of questions used by DM97 is similar to ours, but the estimation strategy is different. DM97 estimate IQR and MED from fitting a lognormal distribution to the questions for each of the levels. They do not explicitly use the information on the highest and lowest possible incomes. For each individual they define:

$$(\text{MED}^*, \text{IQR}^*) = \underset{\text{MED, IQR}}{\text{argmin}} \sum_{k=1}^{4} \left(\frac{\text{PRO}_k}{100} - \text{LN}(\text{level}_k; \text{MED}, \text{IQR}) \right)^2.$$

Note that this is not the usual parameterization of the lognormal distribution, but that there exists a one-to-one relationship between (MED, IQR) and (μ, σ^2). Unfortunately, this method does not work for households with at least three times a value of zero or one. The best-fitting distribution in that case is a degenerate distribution with all mass at level_k, for which the corresponding PRO_k is unequal to zero or one. Another problem with this method relates to the fact that a lognormal distribution has a positive density for each positive income level and will thus automatically have a positive probability mass outside the interval (lowest income, highest income). Comparing the fitted distribution with the levels of the lowest and the highest possible income, we find that the probability mass outside the interval may be substantial. To give an indication, in our case (when we apply the same method as DM97) for almost 30 percent of the respondents with a non-degenerate subjective distribution, more than half of the total probability mass lies outside the interval. Moreover, for approximately 20 percent of all the respondents with a non-degenerate subjective distribution, the median lies outside the interval. This seems unrealistic. The fact that the lognormal distribution gives a good approximation of the distribution of household incomes over the population does not imply that this is also the case for (subjective) income distributions on the household level.

Table 4 presents the distribution within the population of perceived income uncertainty for the three countries. The first three columns reveal that the income uncertainty in The Netherlands, as measured by the coefficient of variation, lies between the income uncertainty in Italy and the income distribution in the U.S. This result suggests that Dutch households perceive more income uncertainty than Italian households, but that households in the U.S. perceive more income uncertainty than households in The Netherlands. For better comparability between the U.S. and The Netherlands, we also report (in the last column) the estimates using the estimation strategy of DM97. As expected, we have higher levels of income uncertainty, due to the large probability mass attributed outside the interval (lowest income, highest income). To see whether the distribution of σ/μ in the U.S. is really different from the one in the Netherlands, we performed a χ^2-test. The resulting test statistic is equal to 408, exceeding the critical value of 26.3. It should be noted that part of this result might be caused by different survey methods. However, the type of questioning and the estimation procedure in the SEE and in the CPS are similar. In that respect, the U.S. and the Dutch results are comparable. It therefore seems safe to conclude that perceived income uncertainty is smaller in The Netherlands than it is in the U.S.

TABLE 4

RELATIVE FREQUENCY DISTRIBUTIONS OF THE VARIATION COEFFICIENT OF FUTURE INCOME

	Dutch CPS	Italian SHIW	U.S. SEE	Dutch CPS
	Interpol.			Lognormal
$\sigma/\mu = 0.000$	0.18	0.34	0.20	0.28
$\sigma/\mu \leq 0.005$	0.28	0.44	0.20	0.30
$\sigma/\mu \leq 0.015$	0.44	0.70	0.20	0.36
$\sigma/\mu \leq 0.025$	0.58	0.88	0.20	0.47
$\sigma/\mu \leq 0.035$	0.66	0.94	0.21	0.55
$\sigma/\mu \leq 0.045$	0.73	0.99	0.22	0.62
$\sigma/\mu \leq 0.065$	0.82	1.00	0.24	0.71
$\sigma/\mu \leq 0.100$	0.91	1.00	0.34	0.81
$\sigma/\mu \leq 0.150$	0.95	1.00	0.44	0.89
$\sigma/\mu \leq 0.200$	0.97	1.00	0.53	0.92
$\sigma/\mu \leq 0.300$	0.99	1.00	0.70	0.96
$\sigma/\mu \leq 0.400$	1.00	1.00	0.78	0.98
$\sigma/\mu \leq 0.500$	1.00	1.00	0.85	0.98
$\sigma/\mu \leq 1.000$	1.00	1.00	0.94	0.99
$\sigma/\mu \leq 2.000$	1.00	1.00	0.98	1.00
$\sigma/\mu \leq 5.000$	1.00	1.00	0.99	1.00
Number of observations	1,122	2,909	437	982

Note: For the Dutch CPS, the estimation procedure for the unknown parameter vector in case of the lognormal distribution does not converge when the respondent gave the same answer to all $PRO_1, \ldots, PRO_4$. For this reason we could not use all the observations.

6. CONCLUSIONS

We have analyzed subjective data on income uncertainty using the 1995 wave of the Dutch CentER Panel Survey. In the analysis, we have used answers to questions that elicit the subjective distribution of the next year's household income.

We have used, as a measure of income uncertainty, the ratio of the interquartile range and the median of the subjective distribution of the next year's household income. The median itself is used as a location measure. We find that the household income over the past twelve months is a dominant predictor for future income. However, the previous year's household income is less dominant in predicting next year's household income when the partner of the head of the household has a paid job.

Income uncertainty is higher when household income in the recent past is higher, although the effect is rather small. With respect to the labor-market status of the partner of the head of the household, we find that if the partner is unemployed and searching for a job, the head of the household reports a higher uncertainty about future income. The effect of expected changes is also significant: the larger the expected change in future income, the higher the reported uncertainty about next year's household income will be. Perceived income uncertainty decreases with age until retirement. Comparing our measure of income uncertainty with corresponding studies conducted in the U.S. and Italy, we find

that perceived income uncertainty in the U.S. is larger than in the two European countries.

The results from our analysis suggest that it is worthwhile to use subjective data. This type of data provides useful information and can be used to measure income uncertainty, which is an important aspect in household decision-making. A next step would be to explicitly incorporate subjective data on income uncertainty in models explaining household behavior.

Appendix: Reference List of Variables

Variable	Description
MED	Median; derived from the interpolated subjective expected income distribution.
IQR	Interquartile range; derived from the interpolated subjective expected income distribution.
PastInc	Mid-point of income bracket that contained the household's income over the past twelve months according to the head of the household (eleven brackets are used). The variable is measured in thousands of Dutch guilders.
DumWork	Dummy variable: 1 if the head of the household has a paid job.
DumWorkP	Dummy variable: 1 if the partner of the head of the household has a paid job.
DumUnem	Dummy variable: 1 if the head of the household is unemployed and searching for a job.
DumUnemP	Dummy variable: 1 if the partner is unemployed and searching for a job.
DumFemale	Dummy variable: 1 if the head of the household is female.
DumPartner	Dummy variable: 1 if there is a partner present in the household.
Age	Age of the head of the household.
DumEdu1–5	Dummy variables for educational levels in increasing levels of education: DumEdu1: primary education; DumEdu2: lower secondary education; DumEdu3: higher secondary and intermediate vocational education; DumEdu4: higher vocational and pre-university education; DumEdu5: university education; Reference group is DumEdu1.
DumStartW	Dummy variable: 1 if the head of the household expects the household income in the next twelve months to be influenced by the fact that a member of the household who is currently not employed will start working.
DumStartW	Dummy variable: 1 if the head of household expects the household income in the next twelve months to be influenced by the fact that a member of the household who is currently employed will stop working.
PrevΔInc	Previous change in income over the past twelve months. The variable is measured in percentage terms.
ExpΔInc	Expected change in income in the next twelve months. The variable is measured in percentage terms.

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