



# LUND UNIVERSITY

## Uncertainty of Inflationary Perceptions and Expectations

Jonung, Lars

*Published in:*  
Journal of Economic Psychology

1986

*Document Version:*  
Publisher's PDF, also known as Version of record

[Link to publication](#)

*Citation for published version (APA):*  
Jonung, L. (1986). Uncertainty of Inflationary Perceptions and Expectations. *Journal of Economic Psychology*, 7, 315-325.

*Total number of authors:*  
1

### General rights

Unless other specific re-use rights are stated the following general rights apply:  
Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal

Read more about Creative commons licenses: <https://creativecommons.org/licenses/>

### Take down policy

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

LUND UNIVERSITY

PO Box 117  
221 00 Lund  
+46 46-222 00 00

## UNCERTAINTY ABOUT INFLATIONARY PERCEPTIONS AND EXPECTATIONS \*

Lars JONUNG

*Lunds Universitet, Sweden*

Received February 7, 1986; accepted May 28, 1986

This article reports the result of a survey designed to investigate the degree of uncertainty by which a representative sample of Swedish households hold their perceptions and expectations of inflation. The public displays hardly any uncertainty concerning the direction of change of the price level as measured by the ratio of 'don't know' answers. However, when asked for numerical estimates of the perceived and expected rate of inflation, uncertainty increases considerably. The ratio of 'don't know' answers is now about 45 per cent. Respondents giving numerical measures were asked to rank how certain they felt about their answers. The majority of them felt they were 'rather certain'. A major difference in certainty was found between men and women. No major differences existed across age, place of living and education. The major conclusion of this study is that the public does not hold its inflationary perceptions and expectations with complete certainty as commonly assumed.

### 1. Introduction

The purpose of this study is to examine the degree of uncertainty by which the public holds its perceptions and expectations of inflation. This study is based on a questionnaire designed for obtaining measures of this type of uncertainty. To my knowledge, no study of this kind has been published earlier.<sup>1</sup>

\* This report is part of a project on inflationary perceptions and expectations in the Swedish economy supported financially by the Swedish Council of Social Sciences and the National Institute of Economic Research. I have received valuable help from Robert Goldsmith, Tarmo Haavisto, Alan Harkess, Lars Jonsson, Jonas Ranstam and Erling Pettersson.

Author's address: L. Jonung, Nationalekonomiska Institutionen, Lunds Universitet, Box 5137, 22005 Lund, Sweden.

<sup>1</sup> Friman and Blomqvist (1984) adopt a similar approach to examine inflationary uncertainty. However, they use a survey among students of the Swedish School of Economics and Business Administration in Helsinki, Finland, which produces in their opinion 'a rather homogeneous sample'. This problem is avoided in the study reported here as it is based on a representative nationwide sample of Swedish households.

Recent work on inflationary expectations and stabilization policies has emphasized the role of uncertainty regarding the future development of the price level. Uncertainty of the future course of inflation, that is, price-level unpredictability, is commonly regarded as a source of inefficiency. A basic result in empirical work on the effects of inflation uncertainty is that inflation uncertainty has a negative impact on economic activity and employment – see for example Levi and Makin (1980) and Holland (1986). Various policy proposals have been put forth to reduce inflation uncertainty, see for example Friedman (1977) and Fischer (1984).

There is a large body of literature dealing with the construction and measurement of inflationary expectations. This literature is based on two approaches. One approach utilizes questionnaire studies which ask for estimates of the expected rate of inflation. The answers of the respondents are aggregated and the mean value of the estimates is taken as the single representative measure of the expected rate of inflation. The alternative approach is to construct the expected rate of inflation from past rates applying an ad hoc expectations generating mechanism. This procedure assumes that the public has full knowledge about the history of inflation and that this history is extrapolated into the future.

Regardless of the approach chosen, it is as a rule implicitly assumed in empirical work that the public holds its inflationary expectations with complete certainty, that is, the subjective probability of the representative individual concerning his or her expectation is assigned the value of one. However, individuals do not hold their expectations with complete certainty as will be shown in this study.

A number of proxy measures of inflation uncertainty have been constructed. Working with sample survey data on expectations, the standard deviation of the individual point answers has been adopted as one measure, see for example Batchelor (1985) and Blomqvist (1983), and the variability of the forecast error as another, see for example Cukierman (1984: 61–66). The proportion of ‘don’t know’ answers of total answers has also been suggested as a proxy, see Jonung (1981) and Friman and Blomqvist (1984). An increase in variability or in the ratio of ‘don’t knows’ thus indicates an increase in aggregate inflation uncertainty.

Other researchers have constructed measures of inflation uncertainty starting from models of inflation. Klein (1975) adopts a moving aver-

age of the standard deviation of past price changes as a measure of price-level uncertainty in a study of long-term price-level movements in the United States. More elaborate models of inflation have been used to obtain measures of inflation uncertainty, see for example Evans (1983).<sup>2</sup>

Existing empirical studies construct as a rule proxy measures of uncertainty concerning future inflation that are 'indirect' and refer to aggregate behavior. Here an attempt is made to obtain 'direct' and group-specific measures of uncertainty of inflationary expectations as well as of inflationary perceptions, that is of the rate of inflation that the public perceives to have experienced in the immediate past.

## 2. The questionnaire

Ideally we want a measure of the subjective probability by which an individual holds his or her inflationary perception as well as expectation, that is, we want first to obtain a point estimate of the perceived and expected rate and then a measure of the degree of certainty associated with these numerical values.

The questionnaire was designed to explore the perceptual and expectational uncertainty of the respondents in three steps. First, the respondents were asked about their beliefs concerning the direction of change in the price level during the past twelve months. They were given four alternative responses: (1) Prices have increased, (2) Prices have declined, (3) Prices have remained unchanged, and (4) 'Don't know', see table 1. This question was thus qualitative as the respondents were not asked to give numerical measures of the perceived rate of inflation. The proportion of 'don't know' answers will be used as an indicator of uncertainty about the *direction of change* of the price level.

Second, respondents who answered that prices had increased/decreased proceeded to a question that asked for a numerical estimate of the change in prices: 'By how many per cent do you believe prices have increased/decreased?', see table 1. Here too, a 'don't know' alternative was given. The proportion of 'don't know' answers serves here as a

<sup>2</sup> Fregert and Jonung (1986) suggest that inflation uncertainty should be measured by the length of new wage contracts, that is, a shortening of contract length indicates an increase in inflation uncertainty, *ceteris paribus*.

Table 1

The questionnaire.

- 
- (1) How do you feel that prices in general have changed during the past (coming) 12 months?
- increased (will increase)
  - decreased (will decrease)
  - remained unchanged (will remain unchanged)
  - don't know
- (2) By how many per cent do you believe that prices have increased/decreased (will increase/will decrease)?
- ... per cent
  - don't know
- (3) How certain are you about your estimate of the change of prices during the last 12 months (coming 12 months)?
- very certain
  - rather certain
  - as certain as uncertain
  - rather uncertain
  - very uncertain
- 

*Comment:* The survey was conducted in April 1984 covering a representative sample of Swedish households. First, the respondents were asked about the perceived rate and subsequently about the expected rate of inflation.

measure of uncertainty about the numerical size of the movement in prices.

Third, those who answered with a numerical value were asked to state how certain they felt about their estimate, being given a choice of five categories: (1) 'very certain', (2) 'rather certain', (3) 'as certain as uncertain', (4) 'rather uncertain' and (5) 'very uncertain'.

Analogous questions were asked about the expected rate of inflation during the coming 12 months.

The measures of uncertainty obtained from the above survey are all *ex ante* measures in the sense that no information, available after the survey was conducted, is used – not *ex post* concepts as those of Cukierman and others where the difference between actual and expected rates is utilized to construct proxies of inflationary uncertainty.

The study of inflationary uncertainty was carried out by National Statistics of Sweden as part of a questionnaire survey conducted in April 1984. The rate of inflation was about 6–8 per cent on an annual basis in 1983–1985. Thus, the survey took place during a period of fairly 'high' inflation. The survey covered a nationwide representative sample of the Swedish public of roughly 1,200 individuals. The

frequency of replies to the questions about uncertainty turned out to be considerably smaller as reported below. The survey was as a mail survey accompanied by telephone calls to those who did not respond immediately.

### 3. The empirical results

Confronted with the question about the perceived direction of change in prices, about 95 per cent of the respondents were of the opinion that prices had increased – see column (3) in table 2. The public thus appears to be well aware that an inflationary process was going on. Very few, about 3 per cent, were uncertain as measured by the ratio of ‘don’t know’ answers.

Concerning the expected direction of change in prices, about 88 per cent expected prices to increase. Hardly anyone expected prices to fall. ‘No change in prices’ was chosen by 7 per cent. (This alternative was probably interpreted by some respondents to mean that the rate of change in prices was going to be the same, i.e., they confused changes in the level with changes in the rate of change of prices.) Uncertainty about the future direction of price change, as measured by the ratio of ‘don’t know’ answers, increased slightly to about 5 per cent compared to the ‘don’t know’ share of the perceived rate.

Next, turning to the questions asking for quantitative estimates of the perceived and expected rate of inflation, table 3 demonstrates a

Table 2  
Perceived and expected changes in prices by men and women. Percentage distribution.

Change in prices	Perceived change in prices during the past 12 months			Expected change in prices during the next 12 months		
	Men (1)	Women (2)	Total (3)	Men (4)	Women (5)	Total (6)
Increase	94.3	95.7	95.0	88.6	86.4	87.5
Decrease	0.0	0.2	0.1	0.5	0.7	0.6
No change	2.1	1.9	2.0	6.7	7.3	7.0
Don't know	3.6	2.1	2.8	4.3	5.4	4.9
Number of responses	422	422	844	421	422	843

Table 3

The distribution (percentage) of replies by men and women to the question: 'By how many per cent do you believe that prices have increased/decreased?' (the perceived rate of inflation), and: 'By how many per cent do you believe prices will increase/decrease?' (the expected rate of inflation).

Type of replies	Perceived inflation			Expected inflation		
	Men (1)	Women (2)	Total (3)	Men (4)	Women (5)	Total (6)
Quantitative replies	65.2	44.6	54.8	68.6	43.0	56.0
'Don't know' replies	34.8	55.4	45.2	31.4	57.0	44.0
Number of responses	397	404	801	373	365	738

sharp rise in the share of 'don't know' replies. On average about 45 per cent of the respondents were not able or willing to give a number for the perceived and expected rate of inflation – see table 3 – while the corresponding figure was only 3–5 per cent for the qualitative questions in table 2. It is clear that the step from the qualitative to the quantitative question is a major one in the sense that uncertainty, represented by the share of 'don't know' answers, increases sharply.

Table 3 brings out a striking difference between the sexes. About 65 per cent of the men quantified the perceived rate while the corresponding number is 45 per cent for women. The same pattern holds for the expected rate, 69 per cent for men and 43 per cent for women, respectively. Correspondingly, the ratio of 'don't know' answers is much higher for women than for men. More than half of the women were not able or willing to assign a numerical value to their inflationary perceptions and expectations, although table 2 indicates that there is no significant difference between women and men concerning the perceived and expected direction of change of prices.

One can speculate about the causes of the difference between men and women.<sup>3</sup> Perhaps men feel, when asked to give a number, that they should be able to reply 'properly' while women, in accordance with their gender role, find it socially more acceptable to openly acknowledge their ignorance and/or uncertainty.

Finally, respondents that replied with a point estimate of the change in prices were asked to grade how certain they were about their

<sup>3</sup> Such a difference between men and women is also reported for other surveys, see for example Jonung (1981) for Sweden and Friman and Blomqvist (1984) for Finland.

**Table 4**  
Degrees of certainty of the perceived and the expected rate of inflation by men and women.  
Percentage distribution.

Degree of certainty	Perceived inflation			Expected inflation		
	Men (1)	Women (2)	Total (3)	Men (4)	Women (5)	Total (6)
Very certain	13.6	17.3	15.1	10.3	11.3	10.7
Rather certain	59.6	51.3	56.3	60.3	48.2	55.8
As certain as uncertain	19.1	17.9	18.7	21.6	25.5	23.1
Rather uncertain	6.4	12.2	8.7	6.9	14.2	9.7
Very uncertain	1.3	1.3	1.3	0.9	0.7	0.8

*Comment:* The table covers those respondents who first answered that prices in general had increased (were expected to increase) and then gave a quantitative estimate of the perceived (expected) rate of inflation in the range of 1–50 per cent.

estimates using the scale running from 'very certain' to 'very uncertain' shown in table 1. According to table 4, 15 per cent were 'very certain', 56 per cent were 'rather certain', 19 per cent were 'as certain as uncertain', 9 per cent were 'rather uncertain', and about 1 per cent were 'very uncertain' about the perceived rate. The corresponding figures for the expected rate of inflation are 11, 56, 23, 10 and 1 per cent, respectively. The majority of the respondents (56 per cent) were thus 'rather certain' about their numerical measures of the perceived and expected rates of inflation.

Table 4 suggests that respondents remain roughly as certain about their inflationary perceptions as about their inflationary expectations. This is confirmed by the pattern in table 5 which shows that of those who were 'rather certain' concerning their estimate of the perceived rate, 66 per cent were 'rather certain' about the expected rate. However, there is a tendency for many of those who were 'very certain' in their judgement of the perceived rate to be only 'rather certain' about their judgement of the expected rate of inflation.

Tables 6–8 examine the degree of certainty by age, place of living and education. No striking differences among the various groups are evident. With increasing age the respondents tend to be more certain about the behavior of the rate of inflation (table 6). Geographical location does not appear to be a major determinant of uncertainty (table 7). With increasing education respondents tend to be less 'very certain' and to be more 'rather certain' (table 8).



Table 5  
Degree of certainty for perceived and expected inflation. Percentage distribution.

Perceived inflation	Expected inflation					
	Very certain (1)	Rather certain (2)	As certain as uncert. (3)	Rather uncertain (4)	Very uncertain (5)	No response (6)
Very certain	43	47	6	1	0	4
Rather certain	7	66	18	6	1	3
As certain as uncertain	4	22	59	12	1	1
Rather uncertain	2	17	28	44	6	4
Very uncertain	11	0	7	18	61	4

Table 6  
Age and degree of certainty. Percentage distribution.

Degree of certainty	Perceived rate					Expected rate				
	16-24 (1)	25-34 (2)	35-44 (3)	45-54 (4)	55-64 (5)	16-24 (6)	25-34 (7)	35-44 (8)	45-54 (9)	55-64 (10)
Very certain	18	20	20	20	25	11	11	13	13	19
Rather certain	32	40	44	38	37	30	45	44	42	38
As certain as uncertain	19	16	12	13	13	28	21	18	16	20
Rather uncertain	5	7	8	10	13	10	9	9	10	12
Very uncertain	6	6	3	6	5	2	6	2	6	5
No response	19	10	14	13	8	19	8	14	14	7

Table 7  
Place of living and degree of certainty. Percentage distribution.

Degree of certainty	Perceived rate			Expected rate		
	Major cities (1)	Urban areas (2)	Rural areas (3)	Major cities (4)	Urban areas (5)	Rural areas (6)
Very certain	20	22	19	11	12	16
Rather certain	42	38	37	42	45	35
As certain as uncertain	15	14	15	21	17	24
Rather uncertain	6	9	9	7	11	10
Very uncertain	4	4	7	4	2	5
No response	13	13	12	14	12	11

Table 8  
Education and degree of certainty. Percentage distribution.

Degree of certainty	Perceived rate			Expected rate		
	Elementary school (1)	High school (2)	College (3)	Elementary school (4)	High school (5)	College (6)
Very certain	23	18	15	14	11	12
Rather certain	34	43	45	39	40	44
As certain as uncertain	15	13	15	21	20	19
Rather uncertain	10	4	10	10	7	12
Very uncertain	5	6	4	3	6	3
No response	12	16	11	12	15	10

The standard deviation as calculated from surveys of inflationary expectations has been adopted as a measure of inflation uncertainty. This approach suggests that the standard deviation should increase with growing uncertainty, for example, the standard deviation of the inflationary perceptions and expectations of 'very certain' respondents should be lower than the standard deviation of respondents that are more uncertain. Such a consistent pattern is not revealed by table 9.

Table 9  
The perceived and expected rate of inflation by different degrees of certainty by men and women. Percentage distribution. Standard deviation in parentheses.

Degree of certainty	Perceived inflation			Expected inflation		
	Men (1)	Women (2)	Total (3)	Men (4)	Women (5)	Total (6)
Very certain	11.47 (7.19)	10.59 (3.18)	11.07 (5.69)	8.21 (4.34)	11.19 (4.69)	9.40 (4.67)
Rather certain	9.93 (4.21)	11.35 (7.84)	10.45 (5.82)	8.14 (3.50)	7.78 (3.55)	8.02 (3.51)
As certain as uncertain	12.00 (8.27)	10.68 (5.46)	11.49 (7.31)	8.24 (6.65)	8.19 (4.17)	8.22 (5.72)
Rather uncertain	8.13 (3.78)	11.05 (7.15)	9.76 (6.01)	7.00 (2.92)	7.85 (3.72)	7.47 (3.37)
Very uncertain <sup>a</sup>	10.33	8.50	9.60	8.00	5.00	7.00
Average	10.43 (5.69)	11.03 (6.66)	10.66 (6.09)	8.09 (4.39)	8.26 (3.98)	8.16 (4.24)

<sup>a</sup> Less than 6 replies which makes the value of the mean and standard deviation unreliable.

Respondents who are 'very certain' and 'rather certain' do have a lower standard deviation than those who are 'as certain as uncertain'. 'Rather uncertain' respondents display lower standard deviations than the average for all groups, however, (see columns (3) and (6)). The patterns for men and women differ substantially. Table 9 thus puts into question the use of the standard deviation as a measure of inflationary uncertainty.

#### **4. Conclusions**

This study of uncertainty about inflationary perceptions and expectations suggests several conclusions. First, the public, as represented by the survey sample, displays little uncertainty about the direction of change in the price level, that is, they feel certain that there has been inflation and that there will be inflation in the immediate future judging from the low ratio of 'don't know' answers of 3–5 per cent. This result should not be surprising as the survey was conducted in 1984, a year of high inflation in Sweden compared to the rates of inflation in the 1960s and 1970s.

Second, turning to the point estimates of the perceived and expected inflation, uncertainty increases as measured by the ratio of 'don't know' answers, which encompasses about 45 per cent of the responses. A major difference exists between men and women since women on average are more uncertain than men. Third, those respondents who actually give a point estimate of the rate of inflation display uncertainty concerning their answers. The majority of the respondents are 'rather certain' about their numerical responses.

Fourth, there is a tendency of being slightly more uncertain about the expected than about the perceived rate of inflation. This pattern also holds when the 'don't know' ratio is adopted as a measure of uncertainty. Roughly speaking, the respondents appear to be almost as uncertain about the immediate past as about the immediate future.<sup>4</sup> Fifth, various groupings of the respondents according to age and socio-economic groups do not bring out any strong differences. Finally, the standard deviation of the point estimates across respondents of

<sup>4</sup> A similar conclusion is found in Jonung (1981), covering the responses of about 6,000 Swedish households.

different degree of certainty do not indicate that the standard deviation rises with growing uncertainty as suggested by the use in some studies of the standard deviation as a proxy variable for inflationary uncertainty.

To sum up, the main impression conveyed by the questionnaire study is that a considerable share of the public is not able or willing to give a numerical estimate of their inflationary perceptions and expectations, although it is common knowledge that the price level has been rising in the past and is expected to rise in the future, and those who actually give numerical measures of the perceived and expected rate do not hold these estimates with complete certainty.

## References

- Batchelor, R., 1985. Inflation uncertainty: theory and measurement for the European economy. Discussion paper 37, Centre for Banking and Finance, City University, London.
- Blomqvist, H.C., 1983. On the formation of inflationary expectations: some empirical evidence from Finland, 1979–1980. *Journal of Economic Psychology* 4, 319–334.
- Cukierman, A., 1984. Inflation, stagflation, relative prices, and imperfect information. Cambridge: Cambridge University Press.
- Evans, P., 1983. Price-level instability and output in the U.S. *Economic Inquiry* 2, 172–187.
- Fischer, S., 1984. 'The benefits of price stability'. In: *Price stability and policy. A symposium sponsored by The Federal Reserve Bank of Kansas City.* pp. 33–51.
- Fregert, K. and L. Jonung, 1986. Monetary regimes and length of wage contracts (mimeo). Lund: University of Lund.
- Friedman, M., 1977. Nobel lecture: inflation and unemployment. *Journal of Political Economy* 85, 451–472.
- Friman, K. and H.C. Blomqvist, 1984. On the information basis and subjective uncertainty of inflationary expectations. An empirical study. Working paper no. 123, Swedish School of Economics and Business Administration, Helsinki.
- Holland, A.S., 1986. Wage indexation and the effect of inflation uncertainty on employment. An empirical analysis. *American Economic Review* 76, 235–243.
- Jonung, L., 1981. Perceived and expected rates of inflation in Sweden. *American Economic Review* 71, 961–968.
- Klein, B., 1975. Our new monetary standard: the measurement and effects of price uncertainty, 1880–1973. *Economic Inquiry* 13, 461–481.
- Levi, M. and J.H. Makin, 1980. Inflation uncertainty and the Phillips curve: some empirical evidence. *American Economic Review* 70, 1022–1027.