Inflationary Expectations in Sweden

Jonung, Lars

Published in:
SEB Quarterly Review

1990

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

101. Lars Jonung, "Inflationary expectations in Sweden", *S-E-Banken Quarterly Review* 1, pp 2-12, 1990.

LARS JONUNG

Inflationary expectations in Sweden

The National Institute of Economic Research makes quarterly surveys of inflationary expectations in Sweden. Swedish households have a perception of both historical and expected rates of inflation, which they are able to quantify. The knowledge that households possess of the inflationary environment appears to be good. This should be noted by those responsible for framing economic policy.

Economists assign a central role to inflationary expectations. Such expectations are regarded as a driving force behind inflation, nominal wages and interest rates, employment, and exchange rates. Current controversies in macro-economic research pertain to the properties of inflationary expectations. The effects of stabilization policy are analysed on the basis of the processes that generate expectations. Research in the area has been focused on theory partly because of a lack of data on inflationary expectations.

In January 1978 the Swedish Government's Price Control Committee conducted a survey of a representative sample of about 10,000 Swedish households in order to measure the inflationary expectations of households. The result was used to evaluate the Swedish price-control policy of the 1970s.[1] The investigation formed the basis of the surveys which the National Institute of Economic Research has performed each quarter since July 1979 in co-operation with Statistics Sweden. Thus, a relatively long time series of inflationary expectations in Sweden — unique in certain respects from an international point of view — is available today.

This article describes the surveys made by the National Institute of Economic Research of the perceived inflation and expected inflation of households during the period 1978—1988. The rich data set is classified on the basis of sex, age and income. Differences between forecasts and outcomes are described. Finally, such questions as the following are briefly considered: Which expectation model is used by the public? What do the results imply about the possibilities of stabilization policy to influence expectations? Emphasis is laid in the article on a "down-to-earth" description of the data with the help of tables and diagrams.

Methods of measurement

On the whole, economists have used two methods for measuring inflationary expectations, one direct and the other indirect.

Indirect measures

As a rule, indirect measures have been constructed with the help of official statistics of inflation, measured, for example, as the change in the consumer price index. Inflationary

Lars Jonung is a professor of economics at the Stockholm School of Economics and is economic adviser to the S-E-Bank Group.

[1] A detailed description of this investigation is given in Swedish Government Official Reports, SOU 1981:41. A summary is given in Jonung (1981).

expectations are assumed to be a function of earlier actual inflation. A proxy variable is calculated to represent the unknown "true" time series for inflationary expectations.

The weakness of the indirect method is that we do not know the exact way in which the inflationary expectations are actually generated. The assumptions that must be made in order to derive a proxy variable are more or less arbitrary. The result is suspect as long as we do not know the "true" processes generating inflationary expectations. We can study these processes only when we have obtained direct measures of expectations.

Direct measures

Direct measures are of two kinds — qualitative and quantitative. Both are based on interviews in which a representative selection of individuals answer questions about future price movements. The first category is based on questions where the respondents are required to state the direction of the expected inflation, for example: "Will the price level rise, fall or remain unchanged?" This first generation of studies appeared during the 1950s and 1960s in an environment with relatively low inflation. Consequently, there was weak motivation for asking questions about exact numbers concerning the rate of inflation.

Surveys of the second type attempt to quantify the expected rate of inflation. The respondents are asked to state a figure for the expected rate of inflation or a number from which the expected rate can be derived. For example, the question may pertain to a price index or the price of a basket of goods at some predetermined date in the future, as a rule, 12 months ahead.

Traditionally, economists have been critical of the results obtained from surveys or public-opinion polls because inquiries of this kind do not describe decisions and actions that private individuals or households actually choose to carry out. The "true" perception of the respondents is thus not measured in a correct way.

However, because of the central role that inflationary expectations are assigned today, interest has increased in survey data and their use. There is no satisfactory alternative to direct measures. Access to statistics of inflationary expectations covering long periods, compiled during different stages of the business cycles and under different types of economic policy, provides important information that can increase our understanding of the inflationary process in the Swedish economy.[2]

Questionnaire

The questionnaire used in the surveys conducted by the Institute of Economic Research is described in table 1. The form contains four questions. The first requests the respondent to state whether prices in general have increased, fallen or remained unchanged during the past 12 months, and is thus of a qualitative character.

The second question is intended to obtain a numerical value for the perceived change in the price level — the percentage by which it has increased or decreased. The answer is given in the form of either a numerical value or a range (interval).

The third and fourth questions in table 1 are designed like the first two, but deal with the expected movement in prices over the next 12 months.

Thus, the answers to the battery of questions provide a measure of the perception by households of the historical inflation during the past 12 months (questions 1 and 2). This inflation rate will be called the *perceived rate* below. Questions 3 and 4 give a measure of the *expected rate* for the next 12 months. An interview structured in this way offers the possibility of studying the relation that exists between perceived historical inflation and expected future inflation according to prevailing theory.

The questions are designed to be as general as possible. The intention is that they should be usable irrespective of the direction in which the price change occurs. Moreover, the replies are not steered, unlike the procedure followed in some studies, where the respondents are sup-

[2]Survey studies of inflationary expectations have been conducted primarily in the U.S. The best-known are the Livingston series and the series produced at the Survey Research Center at the University of Michigan. These series have been used in a large number of econometric studies.

Table 1. Questionnaire concerning the perceived and expected inflation.

Question 1	In your opinion, what has been the movement of prices in general during the past 12 months? Do you consider that prices have risen, fallen or remained unchanged? 1 RISEN 2 FALLEN 3 REMAINED UNCHANGED 4 DON'T KNOW
Question 2	By what percentage do you consider that prices have increased/decreased? AN INTERVAL MAY BE STATED .....PER CENT
Question 3	In your opinion, what will the movement of prices in general be during the next 12 months? Do you believe prices will rise, fall or remain unchanged? 1 RISE 2 FALL 3 REMAIN UNCHANGED 4 DON'T KNOW
Question 4	By what percentage do you consider that prices will rise/fall? AN INTERVAL MAY BE STATED .....PER CENT

Note: Questions 1—4 are supplementary questions in Statistics Sweden's quarterly survey of households' purchasing plans.

plied information about previous price changes or given different ranges for the expected inflation rate. Such information influences the replies and may thus produce a misleading picture.

The questions inquire about "prices in general". Respondents receive no information about the price index that is involved. It appears reasonable to use Statistics Sweden's consumer price index (CPI) as a measure of the concept "prices in general", since households are primarily confronted by CPI components, such as food, housing, fuel, lighting, clothes and household articles in their daily purchases.

Each individual household hardly uses the same weighting scheme as Statistics Sweden's consumer price index. Households in which food consumption constitutes a large share of expenditure probably allow food prices to influence the perception of inflation to a greater extent than other households. If food prices have not followed the average price level, this may affect the replies. If, for example, consumption patterns differ between men and women, the young and the elderly, and rich and poor, this factor may similarly contribute to differences in the replies.

The questionnaire was used in a first investigation in January 1978, which was repeated in January 1979. Since July 1979, the interviews have been conducted on a quarterly basis, each January, April, July and October. The investigation is linked with Statistics Sweden's survey of the purchasing plans of households. A report is given below about the replies obtained in a total of 39 surveys conducted over the period 1978—1988 — about 167,000 replies in all.

Qualitative answers

The qualitative answers to questions 1 and 3 are described in table 2. Nearly all those interviewed, 96.5 per cent, considered, on average, that prices had risen during the past 12 months. The proportion who replied "don't know" is 0.7 per cent. A small group stated that prices had remained unchanged (2.7 per cent) or decreased (0.1 per cent). Possibly some in this group interpreted the question incorrectly and believed that it was the change in the rate of inflation, rather than in the price level, that was meant. A mix-up of this kind between rate of increase and change in level may explain the pattern. Anyway, the public are clearly aware that they are living in a world where prices have been rising.

Household expectations of the price trend — see the lower part of table 2 — show the same pattern as the perceived change. A somewhat smaller proportion, 92 per cent, state that prices will continue to rise during the next 12 months. Hardly anyone believes in deflation (0.3 per cent). About 6 per cent of the respondents state that prices will remain unchanged. Again, it is possible that some people have confused the rate of inflation with the price level and stated that the rate of inflation will be of the same size during the next 12 months as it was in the preceding 12 months. The proportion stating "don't know" has increased somewhat — un-

Table 2. Perceived changes in prices during the past 12 months and expected changes in prices during the next 12 months; 39 surveys, January 1978 — June 1988.
(Replies to the "qualitative" questions 1 and 3 according to table 1.)

Perceived price change:

Respondents who believe that prices	have risen	have fallen	have remained unchanged	"Don't know"
Average value	96.5	0.1	2.7	0.7
Max. value	99.1 *(Jan. 78, Oct. 81)*	0.9 *(Jul. 86)*	14.7 *(Jul. 87)*	2.1 *(Jul. 86, Jan. 88)*
Min. value	83.6 *(Jul. 87)*	0.0*	0.5 *(Jan. 78)*	0.3 *(Jan. 83, Apr. 84)*

Expected price change:

Respondents who believe that prices	will rise	will fall	will remain unchanged	"Don't know"
Average value	92.0	0.3	6.1	1.7
Max. value	96.2 *(Jul. 81)*	0.9 *(Apr. 86)*	15.4 *(Apr. 86)*	3.8 *(Apr. 80)*
Min. value	81.0 *(Apr.86)*	0.1**	1.0 *(Jan. 82,(Apr. 84) Apr. 84)*	1.0

*The minimum value was registered in a total of 13 investigations during the period January 1978 — July 1985.
**The minimum value was registered in a total of 12 investigations during the period July 1979 — April 1988.

Note: The total number of replies was 167,994.

certainty is greater about future inflation than about past inflation. However, the difference is not striking. Economic theory assumes that expectations of future inflation are based on the perceptions of past inflation. Table 2 supports this view.

Quantitative answers

Two questions are aimed at quantifying the perception of households about historical (question 2) and expected (question 4) inflation. The respondents may state either a point estimate or a range. Table 3 shows that the first type of reply is more common: about 46 per cent chose to give a figure for the perceived inflation and 50 per cent for the expected inflation, while about 30 per cent chose to state a range. The proportion of those stating "don't know" was just over 20 per cent. Thus, the public have a distinct perception of a rising price level (question 1) but are not as definite in giving the exact size of the increase.

Judging from the "don't know" replies, households appear to be as uncertain about the future as they are about the past. More people would be expected to reply "don't know" in regard to the uncertain and unknown future inflation than to the inflation they have just experienced. The point is that each month the mass media publish statistics of the rate of inflation during the past 12 months, which are freely available to all. On the other hand, more or less continuous forecasts are made of the future rate of inflation, which are likely to influence the expectations of the public to some extent.

The various groups show substantial differences in their quantitative replies. Table 3 shows that women are more inclined to answer "don't know" than men: 30 per cent as against 18 per cent. Another difference is age-linked: young (less than 25 years) and old (more than 64 years) respondents show the highest "don't know" proportions. This proportion is highest for the oldest respondents, about 35 per cent, while it is about half this value for the 25—54 age bracket. As expected, the generations that are the most economically active show the lowest "don't know" proportion. This group is dominated by bread-winners. They are well aware of the inflation process and are ready to give numerical estimates of the rate of inflation in their replies.[3]

Table 5 illustrates the connection between the perception of inflation and household income. Low-income earners and households that

[3]The view that the gainfully employed are best informed about the price trend is supported by Batchelor and Jonung (1987).

Table 3. Distribution of respondents' replies to the "quantitative" questions 2 and 4.
Classified by sex. Per cent.

	Perceived inflation rate			Expected inflation rate		
	Men	Women	Total	Men	Women	Total
Replies stating a numerical value	47.9	42.2	46.3	51.5	46.2	50.0
Replies stating an interval	33.6	25.2	31.2	31.4	23.5	29.2
"Don't know"	18.6	32.7	22.5	17.1	30.3	20.8
Total	100	100	100	100	100	100
Number of replies	121,629	47,126	168,755	121,699	47,056	168,755

Table 4. Distribution of respondents' replies to the "quantitative" questions 2 and 4.
Classified by age. Per cent.

	Perceived inflation:			Expected inflation:		
Agegroup	Reply stating figure	Reply stating interval	"Don't know"	Reply stating figure	stating interval	Reply "Don't know"
<25	49.5	26.5	23.9	52.3	26.0	20.9
25—34	49.5	31.6	18.8	52.8	30.3	16.9
35—44	48.7	33.8	17.4	52.0	32.1	15.9
45—54	46.8	34.1	19.1	50.4	32.0	17.5
55—64	43.3	33.2	23.5	48.5	29.3	22.2
>64	36.7	27.6	35.6	41.7	23.4	34.9

Table 5. Distribution of respondents' replies to the "quantitative" questions 2 and 4.
Classified by household income. Per cent.

	Perceived inflation:			Expected inflation:			
Annual income, SEK 000s	Reply stating figure	Reply stating interval	"Don't know"	Reply stating figure	Reply stating interval	"Don't know"	Total no. of replies
No information supplied	36.9	21.2	41.9	40.9	19.7	39.3	12,529
<40	44.7	25.2	30.2	48.3	23.1	28.6	26,338
40—80	46.2	30.1	23.6	50.1	27.7	22.2	45,871
80—120	47.4	33.6	19.0	51.1	31.5	17.4	39,136
120—200	49.0	36.5	14.5	53.0	34.5	12.6	38,486
>200	48.4	37.3	14.3	50.6	37.4	12.0	6,395

Note: The group with annual income >SEK 200,000 is relatively small. It entered the statistics for the first time in April 1984, when it comprised 39 households.

have not supplied any information about their income show the highest proportion of "don't know" replies. The ratio falls with rising income. Of households with an annual income exceeding SEK 200,000, only about 12—15 per cent state no numerical value, while the corresponding figure for households with an annual income below SEK 40,000 is about 29—30 per

cent. The income level is also likely to reflect differences in education. Respondents with a long period of education appear more inclined to give a figure.

The perception of inflation is good...

Since the replies including a numerical value are dominant, let us concentrate on them. Thus, tables 6 and 7 and diagrams 1—5 are based on the average value of the numerical replies. This value is regarded as a measure of the inflation perceived and expected by households even though the replies show a substantial dispersion. (See the section below on dispersion and uncertainty.)

How is the perceived rate of inflation related to the inflation that is actually registered? The following conclusions may be drawn from diagram 1: first, the perceived rate of inflation follows the actual rate; second, the perceived inflation shows a smoother pattern than the actual. The public is aware of the trend of inflation but finds it more difficult to discern short-term fluctuations.

The perception error — the difference between perceived and actual inflation — is described in diagram 2. Perception of inflation is a sluggish process and, with the sharp downturn in inflation in 1978—1979, the public could not "keep up": the perceived inflation was higher than the actual. The perception error was positive. When inflation rose sharply in 1980, the reverse situation arose: the perception error was negative. Since 1982, the rate of inflation in Sweden has been falling in the long-term perspective. The perceived inflation has followed the trend well, but has constantly been above it.

The perceived rate of inflation calculated as the average for all surveys is 9.9 per cent for the period 1978—1988. The actual rate of inflation calculated as the average for the months during which the interviews were conducted was 8.3 per cent according to the consumer price index and 9.5 per cent according to the food price index in table 6. If we use the food price index to measure the actual inflation, we obtain a somewhat greater similarity between perceived and actual inflation. The perceived error is centred more about the zero line: 19 observations above, 18 below and 2 on the line. (The perception error is calculated as the absolute error for all investigations.)

Thus, the general public does not have any perfect picture of inflation in the sense of exact correspondence between the replies and the change in the consumer price index. However, there seems to be a good perception of the prevailing inflation and its trend. The consumer price index itself is associated with substantial errors of measurement. It is not the optimal yardstick of the rate of inflation. We cannot rule out the possibility that the perceived rate of inflation — as measured in the surveys carried out by the National Institute of Economic Research — lies closer to the "true" inflation than Statistics Sweden's index. However, we are forced to accept the consumer price index as our yardstick in order to have a standard of comparison.

...and so are inflationary expectations

How well can households forecast future inflation? What precision is there in inflationary expectations? Diagram 3 shows expected inflation as well as actual inflation. The diagram is read such that the expected inflation stated for January 1979 is the figure given by households in the survey 12 months earlier. The actual inflation for January 1979 is calculated for the same period, that is, from January 1978 to January 1979. The difference between expected and actual inflation constitutes the expectation error.

The pattern of diagram 3, like the pattern of diagram 1, shows that the expected rate of inflation is more stable and more slow-moving than the actual rate of inflation. The exception in July 1982 was probably caused by the discussion in the press in the summer of 1982 about sharply raised food prices. Otherwise the expected inflation is distinctly smoother than the perceived inflation.

The expectation error is described in diagram 4. During periods with wide fluctuations in the rate of inflation — as at the end of the 1970s and beginning of the 1980s — the expectation error is large in relation to the more stable inflation prevailing in the mid-1980s. The expected inflation is 8.6 per cent for all observations. Consumer prices and food prices rose 8 per cent and 9.5 per cent, respectively, during

Table 6. Perceived and actual inflation during the past 12 months.
All replies, January 1978 — July 1988. Average of 39 surveys. Per cent.

Perceived inflation	Actual inflation according to:		Perception error Average error		Absolute error	
	CPI	FPI	CPI	FPI	CPI	FPI
9.9	8.3	9.5	1.7	0.4	2.2	1.9

Note: CPI and FPI stand for consumer price index and food price index, respectively.

Table 7. Expected and actual inflation during the next 12 months.
January 1978 — July 1988. Average of 39 surveys. Per cent.

Expected inflation	Actual inflation according to:		Expectation error Average error		Absolute error	
	CPI	FPI	CPI	FPI	CPI	FPI
8.6	8.0	9.5	0.6	−0.9	2.1	2.5

Note: CPI and FPI stand for consumer price index and food price index, respectively.

the period. The expectation error, measured as the absolute error, is about 2 percentage points (table 7).

Tables 6 and 7 show that the perception error and expectation error are of about the same size. Thus, the public are equally proficient at stating the current inflation as they are at forecasting inflation 12 months ahead. This result should give cause for some reflection. In economic theory it is assumed that decision makers are familiar with economic developments to date when making decisions about

Diagram 1. Actual and perceived rate of inflation in Sweden
Per cent

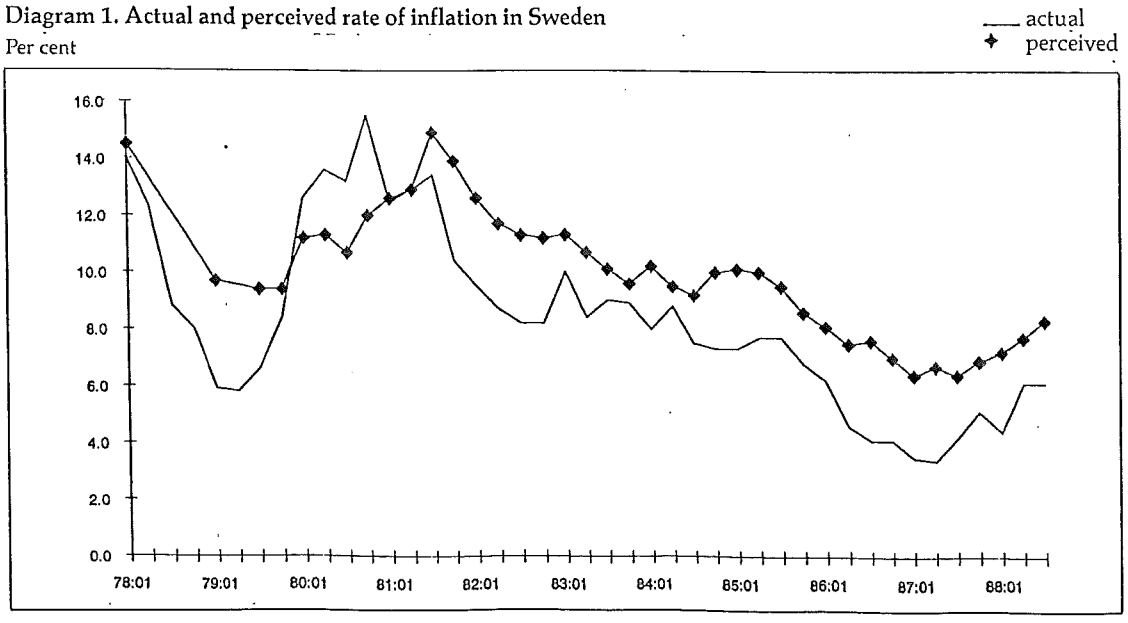


Diagram 2. Perception error
Difference between perceived and actual inflation in Sweden. Per cent.

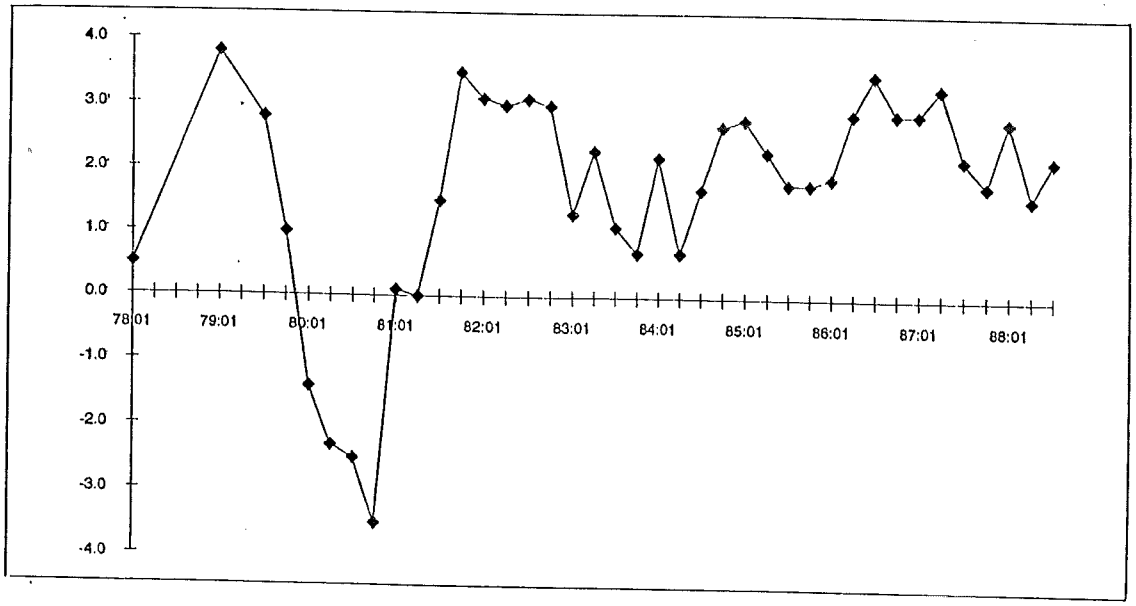
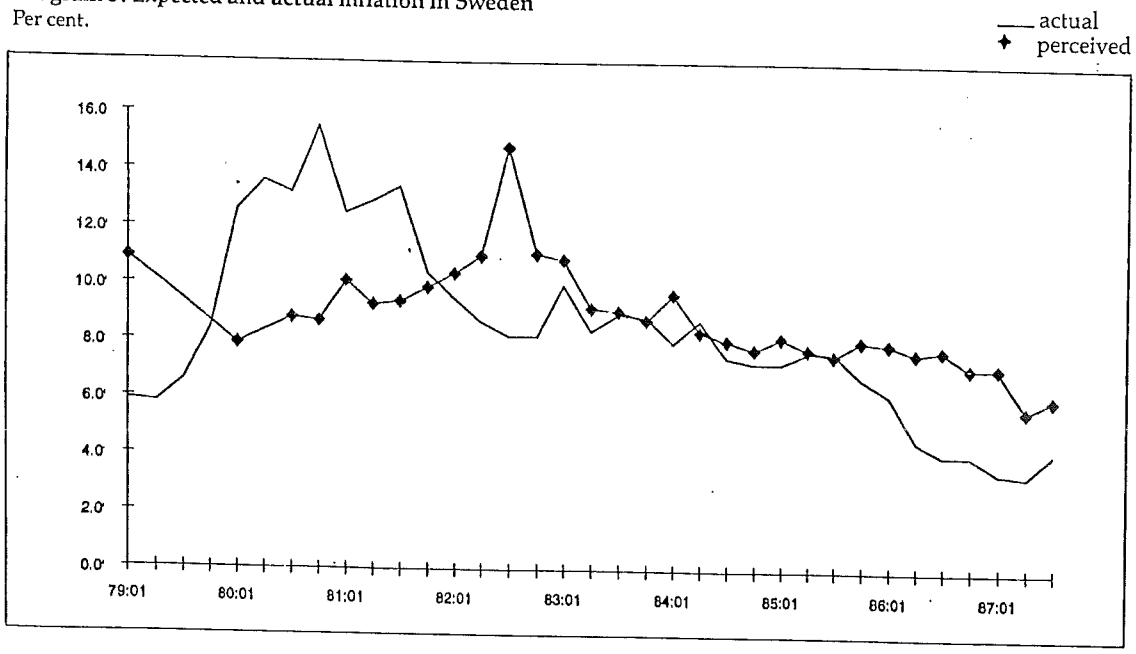


Diagram 3. Expected and actual inflation in Sweden
Per cent.



future actions. According to this reasoning, expectation errors should be larger than perception errors, but this is not the case.

If the material is classified by group, it appears that men and women are equally good at forecasting. Their perception and expectation errors are of the same size on the whole. The same applies to various age groups: the elderly are not better than young or middle-aged people in their assessment of inflation. The answers classified by large urban centres, sparsely populated areas and other areas do not

Diagram 4. Expectation error
Difference between expected and actual inflation. Per cent.

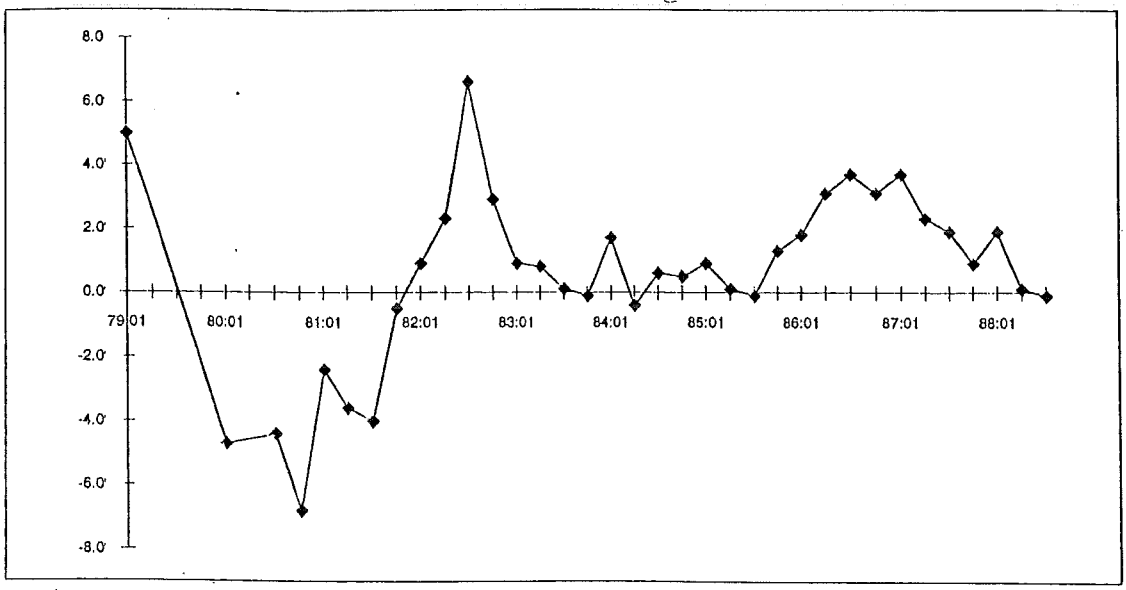
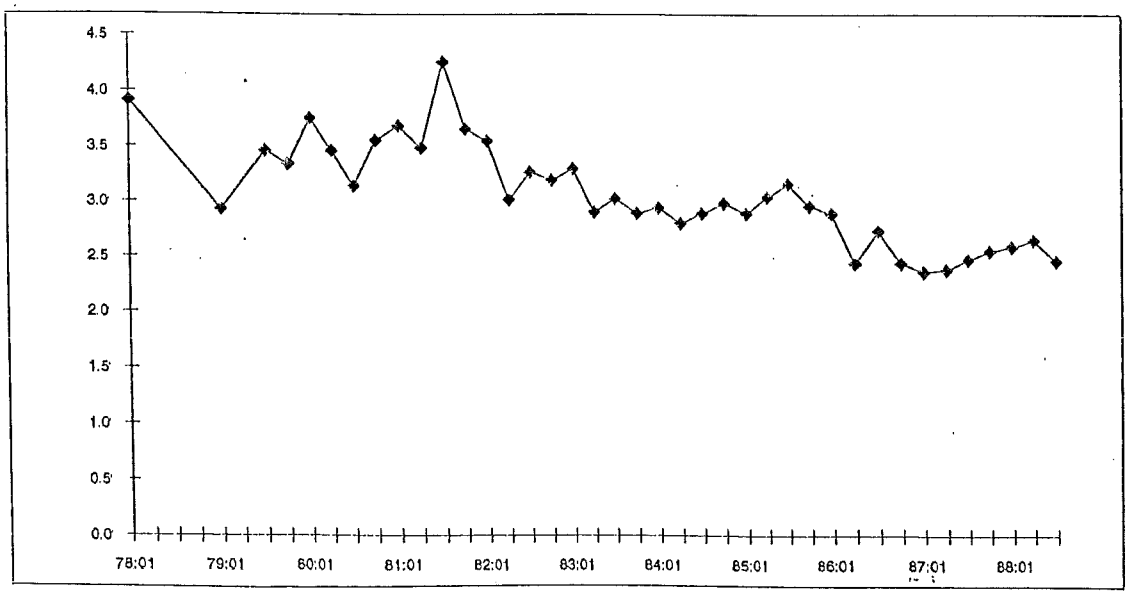


Diagram 5. Dispersion of the expected inflation as the standard deviation of the numerical replies stating a value.
Percentage points.



indicate any regional differences. Nor do there appear to be any marked income-dependent differences.

Uncertainty and dispersion

A respondent who supplies a numerical value for the perceived and expected inflation hardly expects to be completely sure that precisely that figure will be the correct one. Every reply is associated with a certain degree of uncertainty in the form of a subjective probability distribution about the numerical value. Since uncer-

tainty is assigned an important role in macro-economic theory, statistics of uncertainty on the part of the public about inflation would be valuable. However, it is impossible to produce a measure of this directly from the surveys.

A simple attempt at providing information about the existence of uncertainty is made in diagram 5, where the dispersion about the numerical replies, i.e., the standard deviation, is illustrated. The standard deviation, which constitutes approximately half of the expected inflation, displays a weakly declining trend. This may be interpreted as showing that uncertainty about future inflation has decreased somewhat during the 1980s.[4]

Formation of expectations and economic policy

The tables and diagrams show that inflationary expectations permeate the entire Swedish economy. Which factors determine inflationary expectations? The underlying driving force is the upturn in the general price level throughout the post-war period. Price increases form an integral part of the public's conception of the economy in Sweden. This information is reflected in the perceived inflation, which is the most important source of expectations. Econometric estimates of the determinants of expectations lend strong support to this conclusion.[5] Expressed roughly, these calculations show that the Swedish people hold a macro-economic model of the mechanisms that determine inflation.[6]

If the objective of stabilization policy were to dampen inflationary expectations — something that has often been stated by Swedish finance ministers during the 1970s and 1980s — measures should be taken that dampen the actual rate of inflation. Inflationary expectations would then be pressed down as well. The process could be accelerated by combining a traditional austerity programme with various confidence-creating measures — steps informing the public that the economic-policy authorities are "in earnest" this time. Examples of such steps would possibly be the abolition of the right to strike on the part of public-sector employees, a more independent central bank, new forms for wage formation, and constitutional limitations on parliamentary fiscal power.

A number of economic-policy measures in Sweden have been justified on the grounds that they would directly influence prevailing inflationary expectations. The intention was to dampen the rate of inflation faster in this way than by first taking a "roundabout" route to push down the actual inflation and then, after a certain time lag, the expected inflation. It was stated that the price controls of 1970—1990 would be capable of directly reducing expectations. However, examination of the data of the National Institute of Economic Research shows that no significant change occurred in the expectations of the public.[7] To be successful, moves of this kind require that the public has faith in them.

Rational expectations?

During the past 15 years, the theory of rational expectations has dominated research in macro-economics, particularly in the U.S. In short, according to this theory, all "relevant" information available at the date of forecast is utilized efficiently. The theory is often stated in the form that "decision makers will not commit systematic errors".

Data from surveys on inflationary expectations have been used, particularly in the U.S., in econometric tests of the rational expectation theory. The Swedish expectation series are also suitable for studies of this kind. The econometric estimates that have hitherto been made give

[4] A study of uncertainty on the part of the public concerning expectations is given in Jonung (1986). Here the respondents state directly how certain/uncertain their replies are.

[5] See Jonung (1981) and (1984) for econometric tests of determinants of inflationary expectations in Sweden. The perceived inflation is completely dominating. Age also proves to be an important explanatory variable. Expectations fall with rising age, which reflects the older households' experience of lower inflation than that ruling during the 1960s and 1970s. Younger households have "shorter" memories and base their expectations only on the high inflation of recent decades.

[6] See Jonung (1984) for a survey of the expectation model that the public "carry in their mind".

[7] See Chapter 9 in Jonung (1990).

a certain support to the rational expectation theory.[8]

Expectations are sometimes described as "unstable" — subject to rapid and impulsive changes. They thus become a source of disturbance, inviting counteracting economic-policy measures. The survey data for Sweden does not support this view. Inflationary expectations seem to have substantial built-in sluggishness.

Conclusions

The surveys of inflationary perceptions and expectations by the National Institute of Economic Research provide valuable knowledge about the Swedish inflationary process. A fundamental conclusion is that Swedish households have a perception of both the historical and the future movement of the price level, which they can express in quantitative terms. This inflationary perception lies close to the actual trend. Thus, households have a good knowledge of the inflationary environment in which they live. This is a fact to which those responsible for economic policy must pay attention.

[8]See Batchelor and Jonung (1986) and Jonung and Laidler (1988).

References

Batchelor, R. and Jonung, L., (1987), "Information Theory and Group Differences in Inflation Expectations", November, Seminar Paper No. 4, Konjunkturinstitutet (National Institute of Economic Research), Stockholm.

Jonung, L., (1981), "Perceived and Expected Rates of Inflation in Sweden", American Economic Review, pp. 961—68, December.

Jonung, L., (1984), "Which Model Do People Carry in Their Mind when They Forecast Inflation Rates?" Seminar Paper No. 1, Konjunkturinstitutet (National Institute of Economic Research), Stockholm.

Jonung, L., (1986), "Uncertainty of Inflationary Perceptions and Expectations", Journal of Economic Psychology, pp. 315—25, September.

Jonung, L., (1990), The Political Economy of Price Controls. The Swedish Experience 1970—1987. Aveb-ury, Gower.

Jonung, L. and Laidler, D., (1988), "Are Inflationary Perceptions Rational? Some Evidence from Sweden", American Economic Review, December.