

SPEECH



DATE: 12 April 2024
SPEAKER: First Deputy Governor Anna Breman
VENUE: Danske Bank, Stockholm

SVERIGES RIKSBANK
SE-103 37 Stockholm
(Brunkebergstorg 11)

Tel +46 8 787 00 00
Fax +46 8 21 05 31
registratorn@riksbank.se
www.riksbank.se

The psychology of inflation¹

The rapid and sharp rise in inflation in recent years is an important reminder of how hard high inflation hurts households and companies and how damaging it is for the economy. High inflation has a negative impact on everyone, with the lowest income households suffering the most.

Let me start by saying that I am very confident we will stabilise inflation at the target. Monetary policy has contributed to a significant fall in inflation. At our last monetary policy meeting in March, my assessment was that we could probably cut the policy rate in May or June.

An overall assessment of the outlook for inflation going forward will determine the timing of any interest rate cut.² The inflation outlook is currently favourable. An important question for me is how we move towards a less contractionary monetary policy without jeopardising the favourable conditions for both inflation and the real economy. An important factor in this trade-off is the expectations of households and companies and how this affects economic decisions. There is a significant difference, however, between companies' inflation expectations, which have fallen markedly, and those of households, which remain at a high level.³

So today, I intend to talk about the psychology of inflation and how it affects households and companies, focusing on the following questions:

- How have households perceived inflation so far and what affects their inflation expectations?
- What have we learnt from the recent fight against inflation and how can we use it to understand inflation dynamics in the coming years?
- What does this mean for monetary policy in the near term?

¹ I would like to thank Björn Lagerwall for excellent work on this speech, Hanna Armelius, Aino Bunge, Charlotta Edler, Marie Hesselman, Ann-Leena Mikiver, Per Jansson and Caroline Jungner for valuable comments and Gary Watson for translation.

² Statistics on inflation in Sweden for March are published on the same day as the speech. This figure was not known when the speech was finalised and is therefore not commented on. Nor is a single monthly figure decisive for the design of monetary policy.

³ For a more detailed discussion of this and other risks, see the minutes of the last monetary policy meeting and the Monetary Policy Report.

Knowledge of how we perceive inflation and form our expectations about it has increased in recent years. Households' inflation expectations tend to be overlooked in the monetary policy analysis, as they are often higher than measured inflation. However, new research shows that households' inflation expectations are important.⁴ Households' expectations affect consumption, investment and saving, factors that are important for both inflation and the transmission of monetary policy and therefore matter for monetary policy both in the short and longer term.

My comments today are partly based on a new Economic Commentary that I have written with my colleague at the Riksbank, Björn Lagerwall, Senior Adviser in the Monetary Policy Department. It discusses the role of psychological factors in monetary policy more generally.⁵ Today I will focus on inflation.

Why low and stable inflation is so important

The former chairs of the Federal Reserve, Paul Volcker and Alan Greenspan, have defined price stability as a condition in which inflation does not influence economic decisions, and that the public does not need to distinguish between nominal and real amounts.⁶ Households thinking in nominal terms and ignoring inflation in their economic decisions is normally referred to as 'money illusion'.⁷ One point of having price stability as an objective for monetary policy could therefore be that the consequences of money illusion need not be so great. In recent years, however, several central banks have highlighted that inflation plays a greater role in economic decisions when it is high.⁸

Figure 1 shows inflation from the 1970s to the present day. The figure clearly shows that high inflation also tends to mean that it varies significantly. Average inflation over the period 1970-1992 was just over 8 per cent, while the standard deviation, i.e. the average variation around its mean value, was almost 3 percentage points. Since 1995, when the inflation target came into effect, inflation has averaged just below the 2 per cent target, with a standard deviation of around 1.5 percentage points.

However, inflation may vary more in the future than it has done in the decades prior to the recent upswing. Some obvious reasons for this are the risk of more frequent supply disruptions due to a changed geopolitical situation, climate change and – related to this – the transition to a fossil-free economy.

If inflation starts to fluctuate significantly in the future, it will pose challenges for monetary policy. First, it creates greater differences between how different

⁴ See Brandao-Marques et al. (2024) and, D'Acunto and Weber (2024).

⁵ See Breman and Lagerwall (2024).

⁶ Greenspan expressed it as "...households and businesses need not factor expectations of changes in the average level of prices into their decisions" and Paul Volcker as "... 'stability' would imply that decision-making should be able to proceed on the basis that 'real' and 'nominal' values are substantially the same over the planning horizon". See the description by Wynne (2008).

⁷ Money illusion is discussed further in the Economic Commentary by Breman and Lagerwall (2024).

⁸ See for example Nagel (2022), Bayarmagnai (2023), Bracha and Tang (2022), Braitsch and Mitchell (2022) and Norges Bank (2023).

households perceive inflation. Second, the gap may widen between how central banks communicate about inflation and how it is perceived by the public.⁹

To act quickly and effectively if inflation starts to rise again, we need, among other things, to start using new data. However, access to more statistics is not enough. We also need to understand better the dynamics of inflation expectations and how they affect the risk of a significant and rapid increase in inflation. There is much to learn from the inflationary upswing of recent years and new research in this area.

Inflation expectations in focus

Figure 2 shows different measures of inflation expectations in Sweden for households, companies and market participants. The measures also show their inflation expectations over different time horizons. Some interesting patterns emerge:

- Long-term inflation expectations have remained close to 2 per cent during the period of high inflation, regardless of the measurement method. This shows that confidence in the inflation target is high.
- Short-term inflation expectations, i.e. one year ahead, are clearly correlated with the actual development of inflation.
- Households tend to expect inflation to be higher than what market participants expect and what actually happens.

Inflation expectations have traditionally featured prominently in central bank analyses and communication. As inflation rose sharply in recent years, there was renewed interest in how those expectations are formed. Two of the questions discussed are:

- whose expectations matter most for monetary policy: those of households, companies or market participants?
- do rising inflation expectations have a stimulating or contractionary effect on the real economy?

Recently, there has also been considerable new research investigating these important issues.¹⁰ I interpret the overall results roughly as follows:

- It is important to look at the expectations of all agents in the economy. Companies are important because they set prices, while market participants are important for price-setting in financial markets. Households' expectations affect their consumption decisions and thus economic activity - and ultimately the ability of businesses to raise prices. Both households and companies play a central role in wage negotiations.
- According to standard macroeconomic theory, higher expected inflation (all else equal) leads to a lower real interest rate, which increases consumption. However, more recent research highlights that higher expected inflation among households could instead lead to lower consumption,

⁹ In a speech two years ago, I discussed the problems that can arise if the difference between how households perceive inflation and how we at the Riksbank communicate about it becomes too great. See Breman (2022).

¹⁰ See, for example, Campos et al. (2022), Coibon et al. (2023), Weber et al. (2022) and Adrian (2023).

which is explained by higher inflation being associated with a declining standard of living.¹¹

My overall conclusion is that the inflation expectations of all agents are important and should be taken into account, but **we need to look more at household expectations** than we have done in the past. Households sometimes tend to be ignored, as their expectations often overestimate actual inflation. The expectations of financial market participants are sometimes emphasised more, as they tend to be more accurate. However, this is not necessarily true during periods of major change, such as in recent years.¹² Recent research also suggests that households' expectations in general should be given more weight in the analysis of inflation and hence in the design of monetary policy.¹³

How we perceive inflation drives our expectations

Households' perception of inflation may differ from their 'objective' measured inflation rate.¹⁴ This is because, in practice, households are neither able to monitor price developments of all product categories nor know the weight of the categories in their consumption baskets. Various studies have shown that households tend to attach importance to certain factors when they form their view of inflation:

- prices that rise more than those that fall
- prices that change considerably
- prices of goods and services that households buy frequently.

In the wake of the pandemic and Russia's illegal invasion of Ukraine, food and energy prices rose particularly rapidly. These are essential items for all households, as well as frequently purchased ones. Figure 3 shows price developments for the entire consumption basket in the CPIF together with energy and food prices. The sharp fluctuations in energy and food prices are clearly visible.

Let me now offer a possible interpretation of households' perceptions and expectations of inflation presented in Figure 2. Firstly, we can understand that they rose more and to higher levels than official CPI statistics have shown in recent years, as households attached great importance to prices that increased relatively quickly, such as food and energy. And the overall high level of households' perceptions and expectations of inflation can be explained by the fact that they attach more importance to rising prices than falling ones.

One might then ask why the perceived and expected inflation among Swedish households has not fallen more, given that energy prices are now falling and food prices are increasing at a much slower pace than before. A psychological explanation, which I have already mentioned, is that households tend to ignore falling prices, such as the price of energy, and instead pay attention to rising prices. There are items in the consumption basket that are still rising unusually rapidly,

¹¹ See, for example, Weber et al. (2022) and Stancheva ((2024).

¹² See, for example, Reis (2022 and 2023).

¹³ See, for example, D'Acunto et al. (2023) and Brandao-Marques et al. (2024)

¹⁴ I will return to the difference between measured and perceived inflation rates later.

such as rents and housing association fees. This can result in households' perception of inflation remaining relatively high.

Another possible psychological explanation is that households compare with a specific price level when forming a view of inflation. There is support for this in the so-called prospect theory, which assumes that we perceive the value of an asset depending on how it relates to a reference.¹⁵ One hypothesis is then that households do not necessarily compare the prices of, for example, energy and food with the same prices one year ago, but perhaps at some other point in time, such as before the start of the inflationary upswing (see Figure 4). If the price level of certain goods remains high according to the reference households use, they may interpret this as inflation still being high.

The overall conclusion is that households' perceptions of inflation and inflation expectations are influenced by a range of factors, and these can differ significantly from the official measures of inflation that normally guide monetary policy. A further complicating factor is that different households are affected differently by inflation.

Differences in objective and subjective inflation

Inflation in official measures should reflect the increase in the cost of living for an average household, but in practice, there are large differences in the consumption basket in different households.

Figure 5 shows an estimate of how the **'objective' measured inflation rate may differ**. It shows three types of households that SCB categorises as follows: the family with children, the student and the retired couple.¹⁶ In a speech a couple of years ago, I discussed these types of households in more detail.¹⁷ The point I want to make here is simple: Different households have different preferences and needs; they therefore do not consume exactly the same things.

It is clear that the measured inflation of a typical family with children rose even more sharply and to a higher level than the official CPI statistics show (see Figure 5). And it reflects a greater weight in their basket on energy and food, which rose rapidly at the start of the inflationary upswing. The student's measured inflation showed a slight lag in relation to official CPI inflation, but on the other hand, it eventually rose to a higher level. The retired couple in this example escaped the rise in inflation comparatively lightly, as their measured inflation rose later and to a lower level than official CPI inflation. Currently, measured inflation for the family with children and the retired couple is close to official CPI inflation, while the student's inflation is slightly higher.

In reality, the differences in measured inflation can be much greater than for the typical households here. For example, there can be major differences between

¹⁵ See Breman and Lagerwall (2024) for a longer discussion of prospect theory and its link to monetary policy.

¹⁶ See Statistics Sweden (2022). One difference is that SCB calls the younger single household 'the single person' instead of 'the student'.

¹⁷ See Breman (2022).

households depending on whether they live in a detached house with direct electric heating and a variable electricity price or in rented accommodation where electricity is included in the rent and the electricity price is also affected by where in the country the household lives.

I want to emphasise two conclusions from this that are important for monetary policy. First: **When inflation rises, the differences between households' actual inflation rates tend to widen**, as the example of typical households illustrated. Now that inflation is falling, this difference is narrowing, as shown in Figure 5. Low and stable inflation thus also facilitates well-functioning wage formation, as it is easier to use a common benchmark when actual inflation does not differ too much between different households.

Second: In addition to the 'objective' measured inflation rate, **the perception of inflation can differ** between groups in society. We saw earlier that actual inflation in the economy as a whole differs from households' perceived and expected inflation. Exactly the same differences can occur 'at the micro level' for individual households. The goods and services they pay attention to and purchase frequently - and which shape their perception of inflation - may differ from what is reflected in their actual consumption basket. Another interesting reason why perceptions of inflation may differ relates to the literature on the importance of experience.¹⁸ Individuals who have experienced dramatic economic events are affected by them for a long time afterwards. This also applies to episodes of high inflation.¹⁹ If we apply these insights to our typical households, the recent high inflation would have affected the retired couple differently to the student. The retired couple has a clear memory of the last period of high inflation, in the late 1980s and early 1990s, while the student has never experienced such a period before.

This brings me to the last area today: households' actual inflation, their perceived inflation and how their expectations can influence companies' pricing behaviour.

Household expectations and companies' pricing

Households appear to be more accepting of price increases stemming from rising costs rather than higher demand. The explanation is strikingly simple – they see fairness in companies raising their prices when it costs them more to produce. In comparison, however, studies have shown that it is perceived as unfair, for example, to increase the price of soft drinks when the weather is unexpectedly sunny, or to increase the price of snow shovels after a snowstorm.²⁰ This can have implications for **companies' pricing behaviour**.

With the rise in inflation in 2021-2022, companies' pricing behaviour changed markedly from previous historical patterns. In many sectors, companies began to pass on much or all of the cost increase to consumers.²¹ This may have been possi-

¹⁸ For an overview, see Malmendier (2021).

¹⁹ See Salle et al (2024).

²⁰ See, for example, Kahneman et al. (1986) and Eyster et al. (2021).

²¹ See National Institute of Economic Research (2023).

ble because households found it easier to accept price increases under the prevailing conditions. In the Riksbank's business survey in spring 2022, companies stated that they "have never seen customers accept price increases so easily".²²

As with households, there are large differences between companies and how they are affected by rising costs. Many have been hit hard by inflation in recent years and are struggling to survive. Others have gained higher profit margins, such as export companies that have benefited from a weak krona or some companies in the food industry.²³

Looking ahead, the pricing behaviour of companies will be central to monetary policy. So their inflation expectations are important. An important point I want to make, however, is that households' expectations also play a role in companies' pricing behaviour, as they affect the acceptability of price increases.

Concluding thoughts

In Sweden, we experienced nearly 30 years of low and stable inflation. This means that younger generations had no memory of high inflation. However, this has changed with the recent surge in inflation, when sharply rising prices suddenly became part of everyday life for broad sections of society. Research suggests that the experience of high inflation affects economic agents for a long time.

Monetary policy has contributed to inflation falling towards the target. In Sweden, well-anchored long-term inflation expectations have been an important part of this development. It has created a stable foundation for wage formation that clearly reduced the risk of a wage-price spiral. At the same time, as inflation increased, we saw that short-term inflation expectations rose sharply and changed companies' pricing behaviour. This highlights how important it is for us to understand better both households' inflation expectations and companies' pricing behaviour in order to analyse and forecast inflation developments.

One uncertainty factor I have mentioned today is that households' perceived inflation and inflation expectations are still at a high level. As I have discussed, there is new research that can help explain this. However, I believe that households' inflation expectations will also fall in the future as price increases slow down further.

My overall assessment is therefore that the conditions are favourable for making monetary policy less restrictive in the near future. It is positive that we now see that inflation has fallen from high levels, and that the inflation outlook is favourable. At our last monetary policy meeting in March, my assessment was that the policy rate could probably be cut in May or June. However, a smooth return to sustainably low and stable inflation should not be taken for granted. Monetary policy therefore needs to be characterised by a learning approach, with preparedness to adjust the policy rate as we gradually work out which rate level is compatible with sustainably low and stable inflation.

²² See Sveriges Riksbank (2022).

²³ See National Institute of Economic Research (2023).

Today I have highlighted some of the research on psychological factors in behavioural economics that are linked to inflation. Behavioural economics can be a good complement to standard macroeconomic models to increase our understanding of both macroeconomic relationships and the development of inflation. The trend towards macro models with 'heterogeneous agents', i.e. different types of households, is also a welcome addition to monetary policy analysis. With new empirical research on how households perceive inflation and form their inflation expectations, we can better understand and manage the challenges facing monetary policy in a turbulent world.

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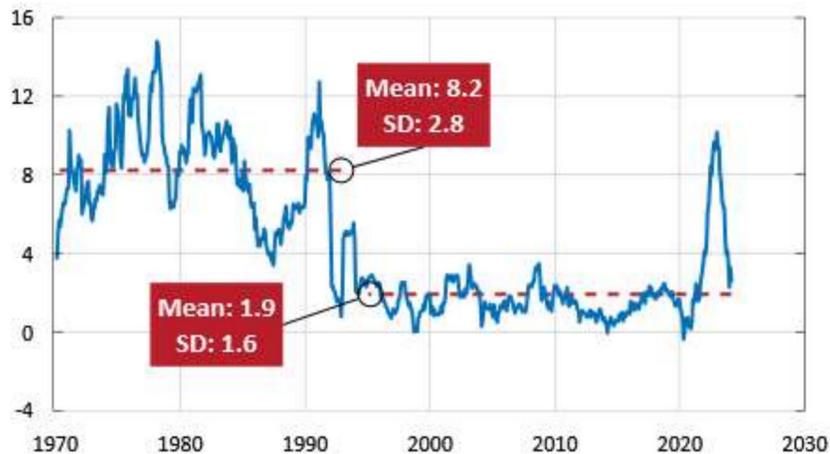
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Figures

Diagram 1. CPIF

Annual percentage change

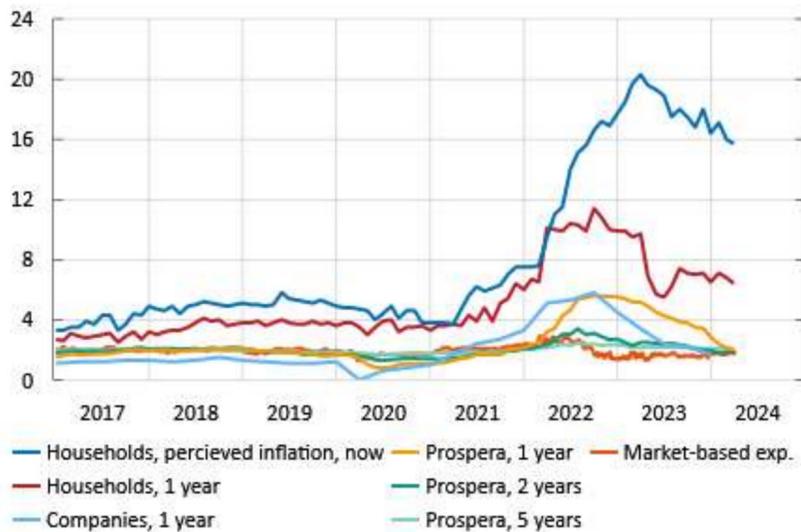


Note. Red dashed lines refer to the mean value for the periods 1970-1992 and 1995-2024.

Sources: Statistics Sweden and the Riksbank.

Diagram 2. Inflation expectations and households' perceived inflation

Per cent

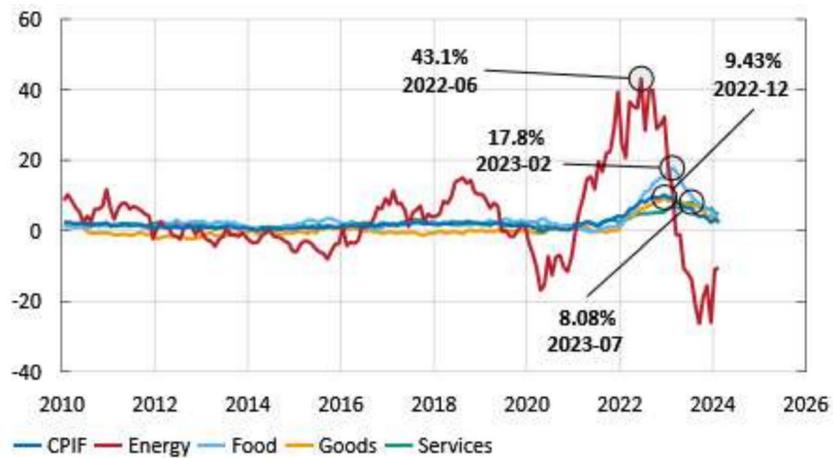


Note. Prospera refers to money market participants. Households refer to mean values excluding outliers.

Sources: Kantar Prospera, Bloomberg, National Institute of Economic Research and the Riksbank.

Diagram 3. CPIF and sub-groups

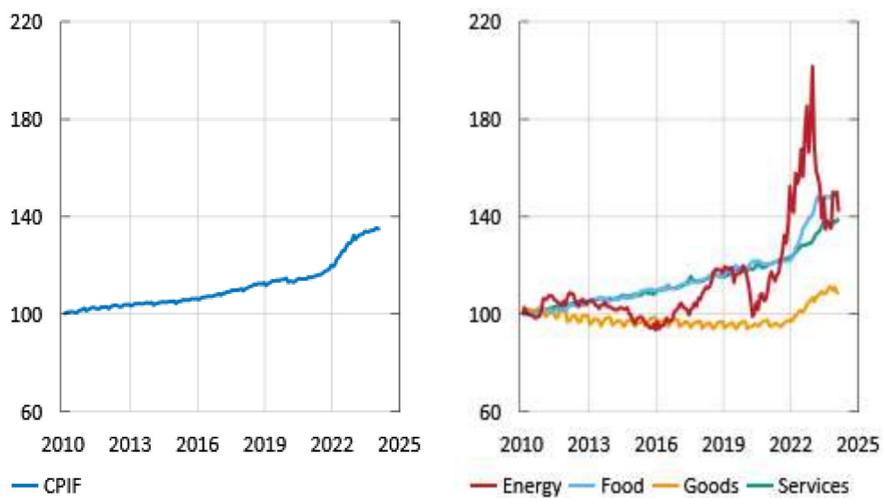
Annual percentage change



Source: Statistics Sweden.

Diagram 4. CPIF and sub-groups

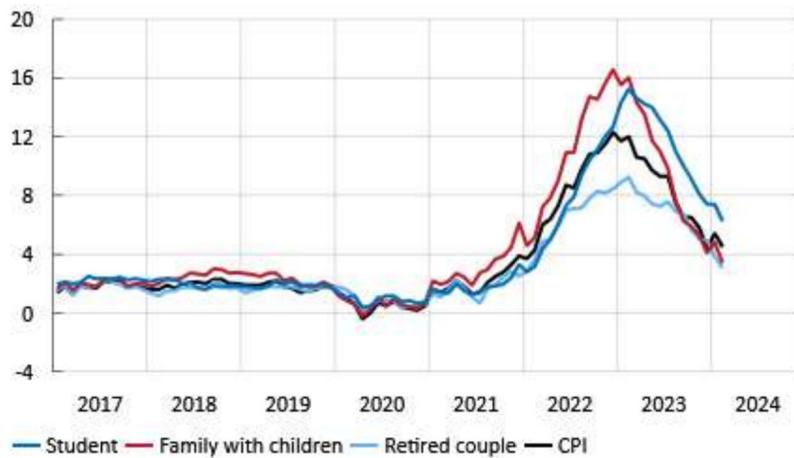
Index, 2010-01 = 100



Source: Statistics Sweden.

Diagram 5. Inflation for different types of households

Annual percentage change



Note. Refers to fictitious households where the family with children is assumed to live in a single-family house, the student in a tenant-owned apartment and the retired couple in rented accommodation. Calculations from Statistics Sweden's Statistical Perspective no. 12 2022.

Sources: Statistics Sweden and the Riksbank.