

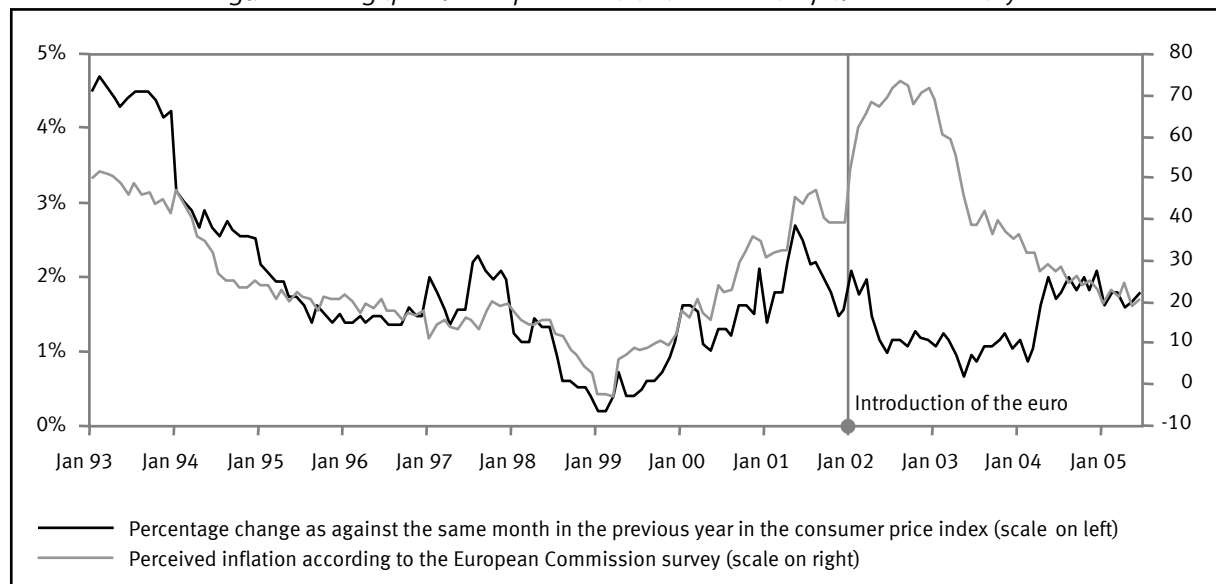
Enhancing the credibility of the Consumer Price Index

Last year, in an effort to enhance the credibility of consumer price statistics, the Federal Statistical Office developed several tools designed to explain to a broad audience how price statistics work. These tools were presented to the general public at a press conference in February. The following essay describes a few aspects of this communication strategy.

1. Background

The European Commission conducts monthly consumer surveys in the European Union addressing various subjects, one of which is prices. Consumers are asked how they think consumer prices have changed over the last twelve months. The answers are used to calculate a qualitative indicator of “perceived inflation”¹ which can be matched against the actual price changes observed in the official statistics (see Fig. 1).

Figure 1: The gap between perceived and observed inflation in Germany



We can see that in the period described the indicator of perceived inflation rose and fell more or less in parallel to observed inflation up to the end of 2001. However, from early 2002, when the euro was introduced as the currency of payment, these two curves follow very dissimilar patterns. Whereas actual inflation rates continued to fall, perceived inflation rocketed. Over the course of a year, the price increases felt by consumers exceeded largely the increases that were being measured. This gap did not start closing until 2003. Very similar patterns were experienced in other countries of the euro zone, but not in European states that had not introduced the euro.

¹The calculation process is described in the Annex.

Although German consumers no longer perceive prices to be rising as fast as they did just after the euro was introduced, and perceived inflation now reflects statistically observed inflation more closely, persuading the public of the reliability of official price statistics has not become any easier in recent years. People remain highly sceptical about the euro. According to a survey by the Demoscopic Institute at Allensbach in December 2004, 59 per cent of the population would prefer to have the deutschmark back.²

In addition to this, general price levels have risen only slightly in Germany in recent years and the inflation rates observed in the official statistics are growing continually smaller. The price level did rise 1.6% in 2004, but this increase was largely due to government measures such as the health reform and higher taxes on tobacco. If the effects of those particular measures are factored out of the inflation rate for 2004, the residual increase is only 0.6%. This low rate of inflation is difficult to reconcile with what consumers feel about their day-to-day shopping, even three years after the arrival of the euro.

2. What message do we want to convey?

2.1 Contents of the communication strategy

The introduction of the euro no doubt played a major part in the temporary wide gap between perceived and observed inflation. Nevertheless, the primary concern of official price statistics is not the popularity of the euro. It is the central banks who are responsible for introducing the currency and hence for explaining its significance to the public. The role of official statistics, meanwhile, is to monitor the impact of introducing the euro on price changes. The statistics agency plays the part of a neutral, independent observer.

Nevertheless, widespread scepticism about the euro has also dented the credibility of our official statistics. While broad sections of the population believe that the euro drove up prices, the statistics put out by the agency do not indicate any inflationary trend in general price levels following its introduction. The official statistics agency, therefore, is concerned to communicate the findings of its statistical surveys more effectively. The focal question is:

***How can statistics indicate such low inflation rates
when people in general are talking about huge price rises?***

This question can be answered by taking a closer look at the “inner workings” of price statistics. To enable people without a statistical training to grasp how price statistics function, we need to explain some basic concepts in the simplest possible terms.

The fundamental message is that the consumer price index is a mean value derived from a large number of disparate observations. These are drawn from different shops, products by different manufacturers, different places across the country, different categories of goods and different consumer habits. Very big price increases – for example, in one particular shop or by one particular service provider – are ironed out by smaller mark-ups or falling prices at other points of sale. This is how it can happen that huge price increases which consumers encounter repeatedly in various places are barely reflected in the consumer price index as a whole.

² Institut für Demoskopie Allensbach, Drei Jahre nach Einführung des Euro, Allensbacher Berichte no. 1, 2005

To explain why this is, we must first consciously acknowledge consumers' subjective perceptions and endorse them with specific examples. This seemed an important step towards arousing a certain interest in the statistics. The second stage was to try to explain the basics of calculating price statistics in order to account, at least in part, for the contradiction between these official findings and individual perceptions of price rises. We offer an example below.

2.2 An example of price rises

The statistical effect of generating mean values is well illustrated by price changes in the hospitality sector. Rather like other service providers, restaurants display clear price increases around the time of the euro's introduction (see Fig. 2). In January 2002 eating out cost on average 2.3% more than in December 2001. Drinks purchased in restaurants were 2% more expensive than in the previous month. It is a big change for one month, because in previous years month-on-month price changes had been about one-twentieth of this. Figure 2 shows these month-on-month changes.

Figure 2: Consumer price indices for restaurants

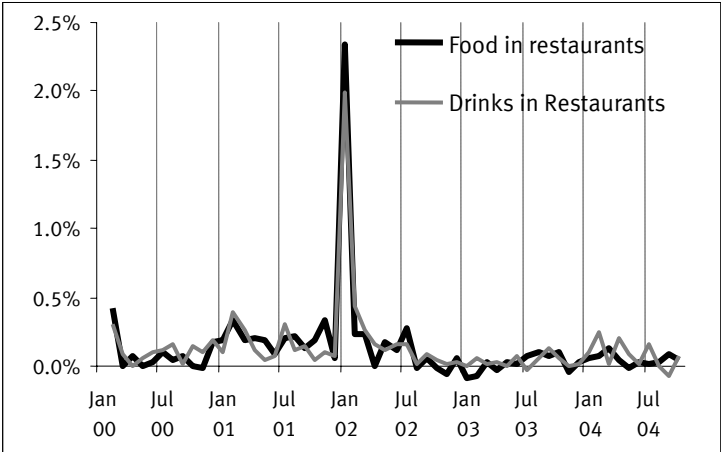
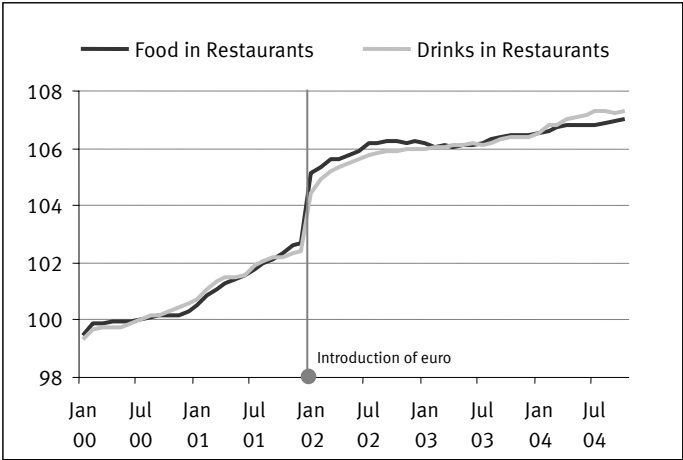


Figure 3 illustrates the same situation, but this time showing the index values.

Figure 3: Consumer price indices for restaurants



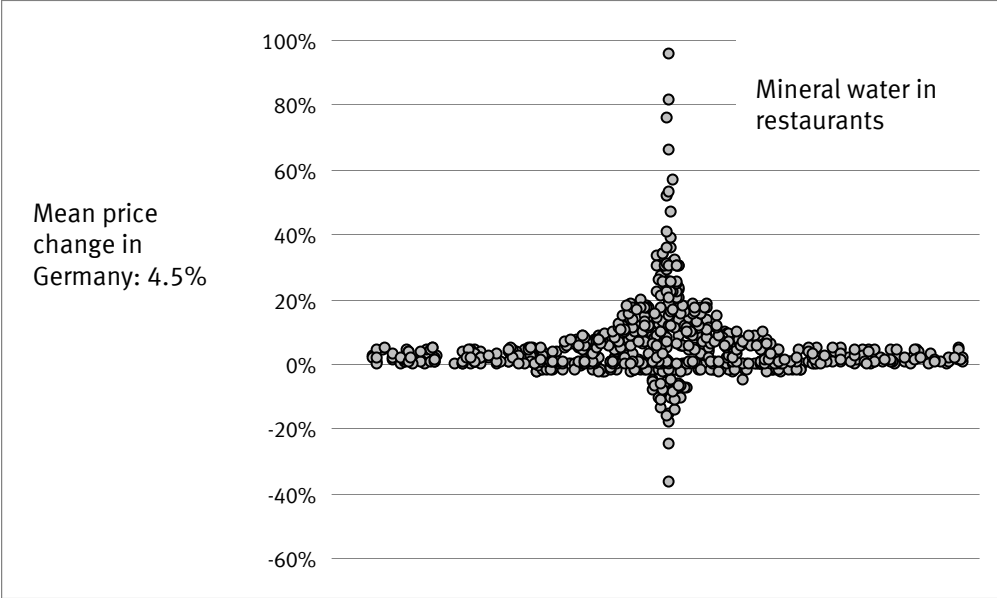
100 = averaged price for the year 2000

If we consider the six months before and after the currency switch, the price of mineral water in restaurants, for example, increased by 4.5%. But 4.5% over the twelve months before and after

the euro arrived is still much less than many people perceived to be happening. Numerous consumers report seeing much higher price increases in the restaurants they visited.

The next step, therefore, was to explain how the statistical mean of 4.5% is put together from a multitude of different price changes. Figure 4 indicates how the price of mineral water changed over the six months before and after the currency switch for every individual hospitality outlet in the random sample from which the consumer price statistics are calculated. Each point represents one of the 761 restaurants in the CPI sample population and shows the price increase from July 2001 to July 2002.

Figure 4: Individual price changes in the year surrounding introduction of the euro



Percentage change in individual prices for the item "Consumption of mineral water" from July 2001 to July 2002

This graph shows how broad the spectrum of price changes was. The denser the cloud of points, the greater the incidence of price changes in this range. Price rises of almost 100% occurred, but remained the rare exception. Increases of up to 40% were more frequent, and rises of around 20% were considered almost "normal" in the hospitality sector. There was also no shortage of price falls in this period. But the bulk of price changes can be found where the cloud is thickest, which is between 0 and about 5%.

This illustrates the limited usefulness of statistical mean values very clearly. This average tells us nothing about the individual price changes which people are confronted with. A mean value is of no relevance to the individual restaurant-goer. If his favorite Italian in Munich has pushed up the prices, he is upset, and he does not much care whether a fast-food joint in Hamburg has put them down at the same time. Consumer perceptions are individual. They cannot be expressed in terms of a simple statistical average.

The conclusion we can draw from this is that for many people "perceived inflation" is bound to be much higher than the inflation rate calculated in official statistics. The main reason is presumably that, in order to calculate the rate of inflation, statistics agencies pursue a strategy aimed at computing a universal average. In the process, bigger price increases in one place are ironed out by more moderate increases elsewhere. This average is a theoretical quantity which does not match what individual consumers experience subjectively. Their consumer habits are

not those of the average household used for statistics. Their price observations cannot be typical and we cannot expect that price rises they find in one place will be offset by price falls they encounter in another or, indeed, that the weighting for different items in their expenditure will be adequately reflected.

As individual observations cannot paint a universally applicable picture of the overall situation in society, it is the task of official statistics to measure things like the inflation rate. This indicator, however, is not about individual cases, but about an objectively determined average value. The method for doing this takes into account the most frequently purchased product variants, the most frequently visited shops, a typical cross-section of towns and the consumer spending of average households. This method has served many purposes well. As the inflation rate is always based on mean values, it can be taken, for example, as a basis for wage negotiations or as an indicator of monetary stability which can guide the European Central Bank.

3. Tools of Communication

Four communication tools have been used to convey the fundamentals of price statistics just described. These are, in brief:

- an information booklet “In the Spotlight – Prices in Germany”
- an index calculator
- a worksheet for schools and college students
- theme boxes on price statistics

3.1 Information booklet

The information booklet “In the Spotlight – Prices in Germany” has been written for the broadest possible target readership. It provides a comprehensive summary of price trends in Germany in recent years and explains the impact of major events, such as the health reform, on the value of money. The booklet also offers a great deal of background knowledge to help people understand and interpret data and addresses the contradiction between perceived and actual inflation. The chapters are as follows:

- Trends in consumer prices in Germany
- Collecting data and calculating the index
- Causes of inflation
- International comparison of price levels, and
- Future projects in price statistics

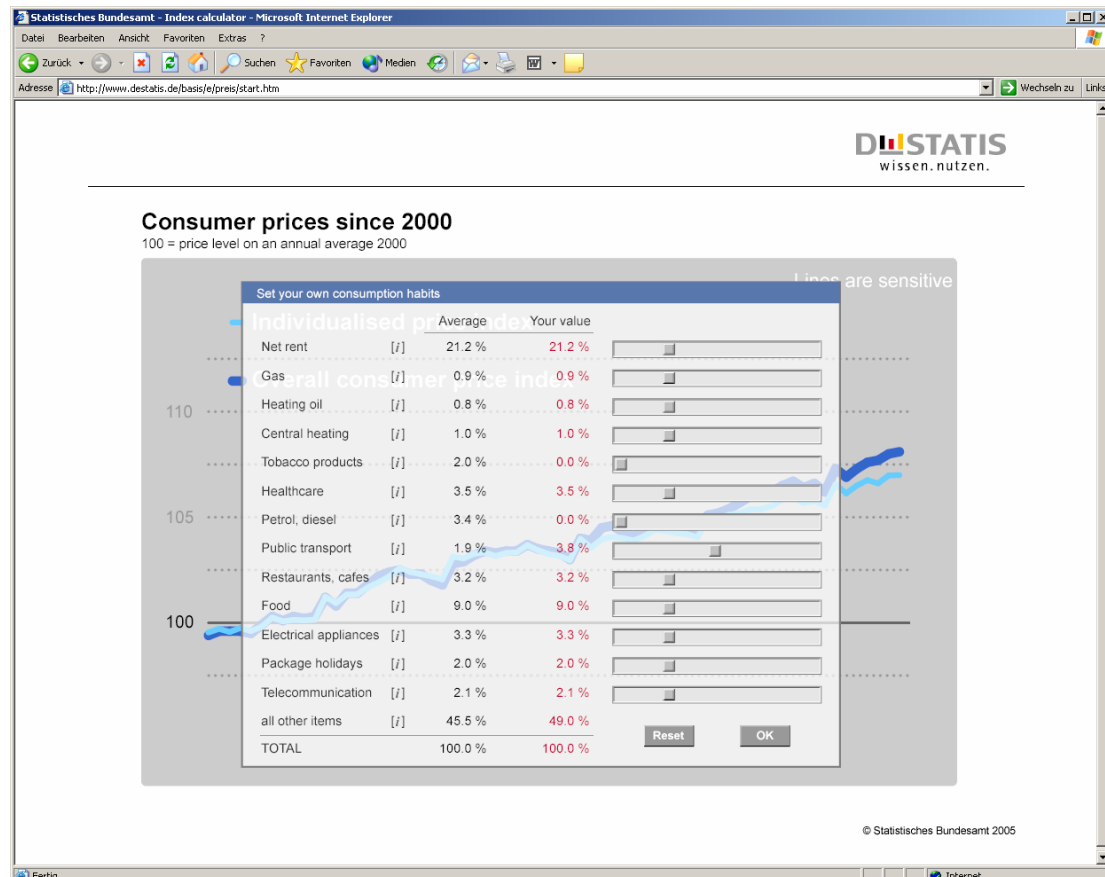
3.2 Index calculator

The rate of inflation does not only depend on price changes. Another key factor is the weighting accorded to price changes for different categories of goods in the overall index. The weighting used by the *Statistisches Bundesamt* reflects the average consumer. In other words, this weighting is typical of an average German household.

This household, however, only exists in theory. If you do not have a car, you will not spend money on petrol, but fuels are an item in the basket on which price statistics are based. Tobacco products are always included, too, although there are many non-smoking households. So the extent to which a particular household is affected by inflation depends very much on what goods it purchases.

To illustrate the gap between a personal inflation rate and the statistical average and present the influence of weighting in simple terms, we designed an index calculator and posted it on the Internet as an interactive application. This is an “experimental consumer price index” which enables users to change the weighting of certain items in the basket by way of examples. They can then see from a graph how altering the weightings in the basket affect the measurements of price change. The index calculator can be found at www.destatis.de/indexcalculator.

Figure 5: Index calculator



With the help of examples, the index calculator illustrates how weighting functions in price statistics. What the user cannot do, however, is to determine what the rate of inflation would be if all his or her personal consumer expenditure were to be taken as a basis. Calculating this would be far too complex and much too difficult for this simple Internet application. The purpose of the index calculator is, rather, to offer a better explanation of how price statistics function by teasing out a few examples.

3.3 Worksheet for schools and college students

The worksheet for schools and for college students was drawn up in collaboration with the publishers Metzler. Six times a year they publish a collection of worksheets on various social policy issues with a circulation of around 2,000. On the front of the sheet there are information and questions about a particular field of interest which can be copied and circulated as a teaching aid. On the back the teacher finds proposals for exercises and further background material. The worksheet on price statistics discusses the consumer price index basket of goods and the influence of weighting on the results of price change calculations.

3.4 Theme boxes on price statistics

The theme boxes on price statistics summarise interesting developments and background data each month in a single-page format. This is published both in the agency's monthly bulletin "*Wirtschaft und Statistik*" and also on the Internet under www.destatis.de → Preise → aktuelle Themen (only available in German). These theme boxes often refer to events in the news – for example, last year to the health reform and rising gas prices. The aim is to make price statistics more interesting by placing the figures in a broader context and thereby to arouse readers' curiosity and at the same time to show how price statistics work in specific areas. It also helps to shore up the credibility of price statistics if people can recognise how real incidents are reflected directly in the official figures.

4. Results

These communication tools were presented at a press conference on 22 February 2005. The media responded very positively, with numerous newspaper articles and radio and TV slots. Examples include:

“Agency creates greater price transparency” in the *Handelsblatt* on 23 February

“Now we have facts and not just a feeling” in the *Südwest-Presse* on 23 February

“The riddle of perceived inflation” in the *Hannoversche Abendzeitung* on 24 February

We can also see from the website hits that the index calculator and the theme boxes are visited frequently. We know from many users' e-mails that there has been a positive response to these tools, and so we can claim that the communication strategy has, on the whole, been successful. However, these measures are by no means enough to change the public image of price statistics sustainably. To achieve that, we would need to seek more frequent and detailed dialogue to explain to people how statistics work.

5. Annex: Calculating “perceived inflation”

The European Commission conducts monthly consumer surveys about the business environment in the 25 EU member states. Nearly 33,000 people are interviewed, 20,800 of these in countries of the euro zone. They are asked for their personal and general assessment of the economy. The following question addresses changes in consumer prices:

“How do you think that consumer prices have developed over the last twelve months?”

They are asked to select one answer from six options:

- risen a lot (PP)
- risen moderately (P)
- risen slightly (E)
- stayed about the same (M)
- fallen (MM)
- don't know (N)

The percentage distribution of answers is converted into a score which is intended to represent perceived inflation. Assessments of constant or falling prices are deducted from assessments of rising prices. The score is determined as follows:

$$\text{Score} = (\text{PP} + 0.5 \times \text{P}) - (0.5 \times \text{M} + \text{MM})$$

The distribution of the selected options is hence expressed as an aggregated balance indicating the difference between positive assessments (prices have risen) and negative assessments (prices are the same/have fallen). The higher the computed score, the greater perceived inflation is deemed to be. The maximum balance of +100 would be obtained if everyone interviewed chose option 1 (“Consumer prices have risen a lot”). A value of -100 is obtained if everyone interviewed opts for answer 5 (“Consumer prices have fallen”). Information on these surveys can be found on the Internet under the link:

http://europa.eu.int/comm/economy_finance/indicators/businessandconsumersurveys_en.htm