

Measuring Perceived Inflation: A Prospect Theory Approach

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1. Public Inflation Perception after changing to the EURO

Ever since the conversion of their national currencies to the Euro in January 2002, people all over Europe feel that prices have gone up considerably as compared to the pre-Euro times. Contrary to that, all the studies published by the National Statistical Offices state that inflation has not risen significantly more since the introduction of the Euro. However, the contradiction between the official line and consumer perception persists. Can it be resolved? The government's statisticians calculations are aiming at quantifying inflation in a certain sense but they do not cover consumers' perceptions. In this paper, a new index of perceived inflation is outlined.

2. Official Consumer Price Indices (CPI)

The official national CPI measure the average development of the quality-corrected prices of all the goods and services purchased by a hypothetical household for consumption. The price quotes are processed using the well-known Laspeyres concept. The key feature of this concept is that current prices are considered in relation to the prices in a base period and are comprised to a weighted arithmetic mean in line with consumer spending in the base period. Thereby, Laspeyres' concept of a price index applies a symmetrical treatment to the way current prices deviate from the base prices. A price increase of one euro is treated in exactly the same way as a price reduction of one euro. This is the only sensible approach given the objective of a consumer price index, since the aim here is to record the overall economic impact of actual price changes.

The official national consumer price index is a statistical paradigm. It is accorded this status because it has, in the past, proved successful in providing essential information to the worlds of business and politics. And so it is not surprising that this paradigm is applied when approaching the perception of the euro as a price-driver. However, if we view the consumer price index as a paradigm of inflation, this perception can no longer be dismissed as simply wrong; it must be seen as an anomaly which needs to be explained.

3. Index of Perceived Inflation

What the individual consumer really wants to know is the extent to which inflation is affecting her everyday purchasing patterns. The pioneering work done by Kahneman and Tversky showed that perception of economic situations depends on the way in which they are presented, on their "framing". The consumer is confronted with inflation during the act of buying something. According to the *availability heuristic*, she will perceive inflation the more powerfully the more often she buys goods which have become significantly more expensive. In contrast, she will barely notice a reduction in the price of goods she rarely buys, or of goods which she acquires without explicitly purchasing them and whose price is deducted every month from her bank account, such as the rent he pays for his accommodation.

Kahneman's Nobel Prize awarded *prospect theory* teaches that economic situations are viewed in relation to a *reference point*, and that losses are perceived as being more significant than equivalent gains. Consumers have a strong *loss aversion* and respond far more sensitively to price increases than to reductions. So one can assume that the price paid for a product the last time it was purchased, or an average of the prices paid in the most recent series of purchases, will serve as a

reference point, and that the displeasure caused by price increases will be far more pronounced than any pleasure occasioned by price decreases. Another well-known effect is the *isolation effect*: purchases are considered in isolation, or in other words price increases are not offset against price decreases, as is the case when the consumer price index is calculated.

Availability, loss aversion and the isolation effect need to be taken into account in any attempt to quantify perceived inflation adequately. For that purpose, first, the individual price changes need to be converted to take loss aversion into account; it has been demonstrated in other contexts that losses are perceived more intensively than gains by a factor c between 1.5 and 2.0. Then these converted prices need to be weighted according to the frequencies with which the consumer buys each of the goods concerned. This leads to the Laspeyres type index of perceived inflation

$$(1) \quad IPI_L^{0,t} = \sum_{i: p_i^t > p_i^0} \left[c \frac{P_i^t}{P_i^0} - (c-1) \right] f_i^0 + \sum_{i: p_i^t \leq p_i^0} \frac{P_i^t}{P_i^0} f_i^0$$

where f_i^0 denotes the base period buying frequencies.

Perceived inflation will deviate particularly widely from the consumer price index when it is primarily everyday goods that are purchased frequently and paid for in cash whose prices increase at an above-average rate. These goods have a particularly heavy weighting in this index of perceived inflation. In addition, a 10 per cent price increase will be perceived as a 20 per cent increase if a loss aversion factor of 2 is applied. One can demonstrate that with a loss aversion factor of 2, any inflation rate will be perceived as being twice as high as that used to calculate the regular consumer price index.

4. Final Remark

Based on this proposal the German Federal Statistical Office is, in cooperation with the author, working on the publication of an index of perceived inflation for Germany. The purpose of this indicator is to quantify the extent to which the average individual is, according to his subjective perception, affected by inflation. This index can then be used to verify if people's perception of the euro as being a price-driver really is true.

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RÉSUMÉ

Depuis l'introduction de l'euro en Janvier 2002, les gens partout en Europe perçoivent une inflation plus élevée qu'avant bien que les indices nationaux des prix à la consommation montrent que l'inflation est plutôt en baisse comparée avec la période pre-euro. Dans cet article la question est posée si cette contradiction peut être résolue. Sur la base de la « théorie de prospect » de Kahneman & Tversky, un indice des prix est proposée qui mesure le degré de l'inflation comme elle est subjectivement perçue par l'individu moyen. Cet indice peut servir pour analyser la question si les prix sont en effet à la hausse depuis l'introduction de l'euro.