

ARTICLE – Inflation not fully comparable between countries

It can be difficult to compare the development of inflation in different countries as the methods used to measure consumer prices differ. One of these differences concerns quality adjustments, which are an important element in the calculation of all consumer price indices. The measured price movements of the products that are often replaced, and that thus need to be adjusted for quality, differ markedly from country to country. It may be difficult to understand the differences as many of the products are similar and are traded across borders. The differences in measurement methods illustrate the need for further international coordination between statistical authorities. Sweden is one of the countries in which measured prices for quality-adjusted goods have developed relatively slowly. The result in this article does not mean that the Riksbank's inflation target should be changed or that the Riksbank should have conducted a different monetary policy.

It is well known that it can be difficult to compare macroeconomic measures from country to country and consumer price statistics are no exception. Several factors contribute towards making the consumer price index (CPI) difficult to compare. Differences in index construction, the composition of the consumption baskets and the way housing costs are measured are examples of such factors. One further aspect is that quality adjustments are not performed in the same way in different countries. The challenges inherent in quality adjustment have long been known, but this article illustrates how different methods can give rise to major differences in measured price movements for some goods and that quality adjustments are greater in Sweden than in many other countries.⁹

Quality adjustments are an important element of all price indices

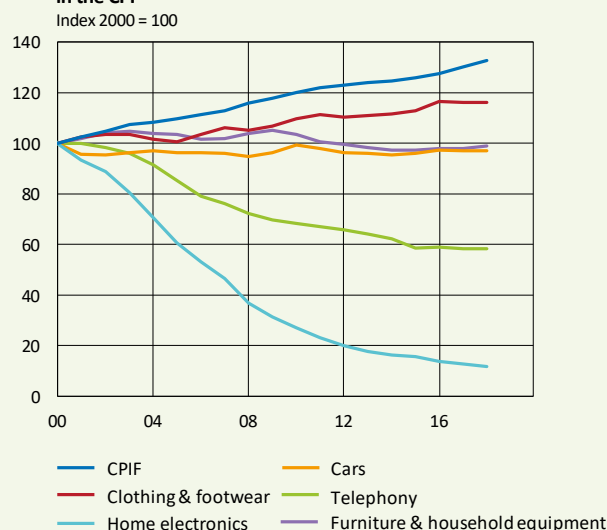
Some form of quality adjustment is almost always performed when a price index is calculated. A consumer price index aims to measure 'pure' price movements and not movements in price due to the quality of a product changing. Above all, adjustments are made in connection with the measured products being replaced by new ones. In Sweden, this takes place either in connection with Statistics Sweden updating the consumption basket in the CPI at the end of the year or regularly over the year if a measured product is removed from the range or is no longer representative.

Quality adjustment methods are not fully harmonised between countries. If some countries systematically make larger or smaller quality adjustments than others, this can give rise to differences in the measured price movement even if the prices of the goods sold have moved in a similar way.

Quality-adjusted products developing weakly in Sweden

Figure 1:13 shows the development of the CPI in Sweden and the sub-indices that measure prices for products that are often replaced and thereby need to be adjusted for quality. These include products with rapid technological development such as computers, telephones and other home electronics. It shows that prices for home electronics, according to CPI statistics, have fallen by almost 90 per cent between 2000 and 2018 in Sweden.

Figure 1:13. CPIF and sub-indices for selected product groups in the CPI



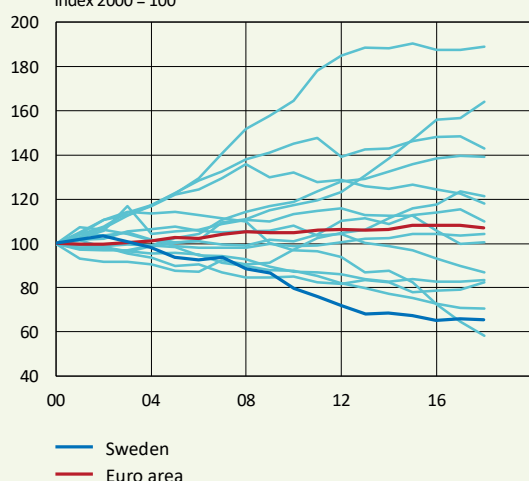
Source: Statistics Sweden

Compared with most other western European countries, the price statistics in Sweden show weaker price growth in all product groups that are frequently adjusted for quality, with the exception of clothes and shoes. It may be difficult to

⁹ This article is based on the results of O. Tysklind, "Quality adjustments and international price comparisons", *Staff Memo*, January 2020, Sveriges Riksbank.

understand the relative price movements measured as many of the goods are similar and are traded across borders, at the same time as the krona has depreciated on average. Figure 1:14 shows development in Sweden and most other western European countries, in relation to the EU28, for home electronics according to HICP statistics. The spread between countries is large and prices in Sweden have fallen relatively substantially compared with other countries.

Figure 1:14. Relative development for home electronics according to the HICP
Index 2000 = 100



Note. A value below 100 means that the index development for the country has been weaker than in the EU28. A figure of 50 should be interpreted as the price in the country being 50 per cent of what it is in the EU28 in relation to the situation in 2000. The turquoise line shows the development in Germany, Ireland, France, Norway, the United Kingdom, Austria, Belgium, Denmark, Finland, Italy, Luxembourg, the Netherlands, Portugal and Spain. Figures for individual countries can be found in the background material on the Riksbank website.

Sources: Eurostat, Statistics Sweden and the Riksbank

There are other data sources that can also be used to measure relative price movements between countries. One such source is the purchasing power parities (PPP) statistics from the OECD and Eurostat.¹⁰ These statistics instead indicate that the price level for home electronics has risen slightly in Sweden in comparison to the average for the EU28 and that price movements from country to country have been significantly more similar during the period 2000–2018.

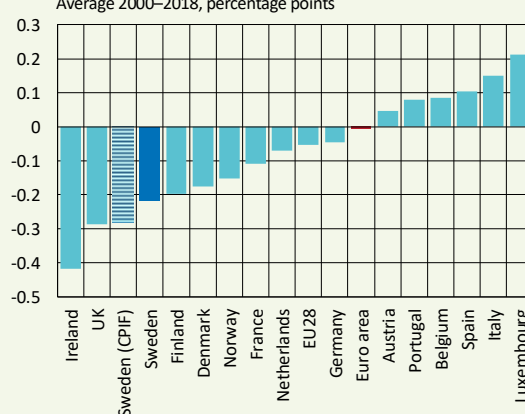
Alternative data sources thus show a different picture.¹¹ The differences due to quality adjustment are so large that they have a marked effect on price movements as a whole. Figure 1:15 shows that the contribution to the annual percentage change in the HICP from the groups that are substantially quality adjusted has been about 0.2 percentage points lower in Sweden compared with the average in the EU28.

¹⁰ These statistics measure the price of a small number of identical or very similar products in the various countries. This means that no quality adjustment needs to be made. Compared with normal price statistics, the selection of products is much smaller, pricing information for each sub-aggregate is collected far less frequently and statistics do not become available until after a certain delay.

Comparability of other variables is also affected

Difficulties in measuring and comparing the consumer price index also affect the comparability of other macroeconomic variables where the consumer price index is included in the calculation. Some examples of this are the real exchange rate, real wages and real interest rates. Differences in how prices are measured also affect, to an extent, the calculation of the development of the real economy, among other things via the fixed-price calculation of household consumption in the National Accounts.

Figure 1:15. Contribution to HICP inflation from quality-adjusted products
Average 2000–2018, percentage points



Note. The contributions are calculated as annual percentage change multiplied by the weight of the different sub-indices shown in Figure 1:13

Sources: Eurostat, Statistics Sweden and the Riksbank.

Should the Riksbank's inflation target be changed?

The results presented here should not be taken to suggest that Statistics Sweden is measuring consumer prices in an incorrect manner or that it has underestimated the development of inflation. The fact that methodological differences mean that price movements are not really comparable between countries is nothing new and neither is it specific to the issue of quality adjustment.¹² The discussion here is limited to quality adjustments and does not take account of other measurement problems or methodological differences.

In Sweden, Statistics Sweden is responsible for the official statistics and the Riksbank has chosen to define the inflation target in terms of CPIF inflation as it is measured by Statistics Sweden. Most comparable countries with variable exchange rates have similar but not identical inflation targets. The results of this article do not imply that the Riksbank should have another inflation target or that it should have conducted another monetary policy this century. For example, the highly expansionary monetary policy of recent years should be viewed in the light of the level of interest rates having

¹¹ See also the discussion on this in the article "Trend development of the Swedish krona" in Monetary Policy Report, July 2019.

¹² See, for example, M. J. Boskin, 1996, "Toward a more accurate measure of the cost of living", final report to the Senate Finance Committee from the Advisory Commission To Study The Consumer Price Index.

become very low internationally and confidence in the inflation target having weakened in 2010–2015. The monetary policy conducted was necessary to re-establish confidence in the inflation target.

However, in several contexts, it is important to be able to compare economic development with the rest of the world. It is therefore important that further international coordination takes place between statistical authorities to harmonise measurement methods for price statistics.