External price impulses to imported consumer goods

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The low consumer price inflation in Norway may largely be explained by the sharp fall in prices for imported goods, which is a result of a price fall in other countries and an appreciation of the krone. The increase in prices for different product groups that are among the imported consumer goods has varied considerably, reflecting a shift in import patterns and strong productivity growth for the production of some goods. To capture these factors, we have calculated an alternative indicator for external price impulses to consumer goods, composed of foreign prices for seven product groups. A disaggregated approach of this kind will probably provide a better measure of price impulses than traditional indicators that are based on aggregated indices for export prices or producer prices among trading partners.

Introduction

Inflation is low in Norway and has been considerably below the inflation target of 2½ per cent. The low consumer price inflation may largely be explained by the sharp fall in prices for imported goods which is a result of a price fall in other countries and an appreciation of the krone (see Chart 1). Imported consumer goods have a weight of 28 per cent in the consumer price index adjusted for tax changes and excluding energy products (CPI-ATE). Prices for clothing, footwear and audiovisual equipment have shown the sharpest decline (see Chart 2). These goods account for about 1/3 of imported consumer goods. The fall in prices for the other imported goods in the CPI-ATE has been less pronounced. Car prices, for example, are currently at about the level prevailing in 2002.

Developments in prices for imported goods in Norway's consumer price index are largely determined by exchange rate movements and developments in foreign prices for these goods. Prices for these goods are also influenced by domestic factors such as wage growth and sales margins, shifts in trading patterns and

changes in tariff rates. This article discusses how we can measure changes in foreign prices for imported consumer goods. Changes in these prices are referred to as external price impulses to consumer price inflation. A discussion of the traditional indicators for external price impulses follows. These indicators have a number of weaknesses. We then present a new indicator for external price impulses to consumer price inflation. This indicator has been described in a box in *Inflation Report* 1/04.

Traditional indicators

There are no statistics that provide a precise measure of the external price impulses to consumer goods. We have traditionally estimated the externally generated price impulses in the light of developments in commodity prices and aggregate indices for trading partners' consumer prices, export prices and producer prices for manufactured goods. These statistics are readily available and the figures are updated regularly. Over time, there will be a relationship between growth in trading partners'

Chart 1 CPI-ATE. Total[1] and by supplier sector[2]. 12-month rise. Per cent. January 1999 - May 2004
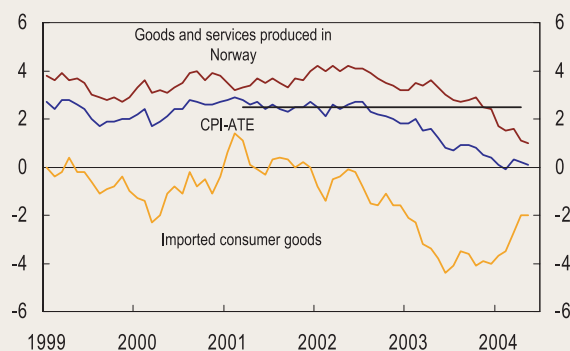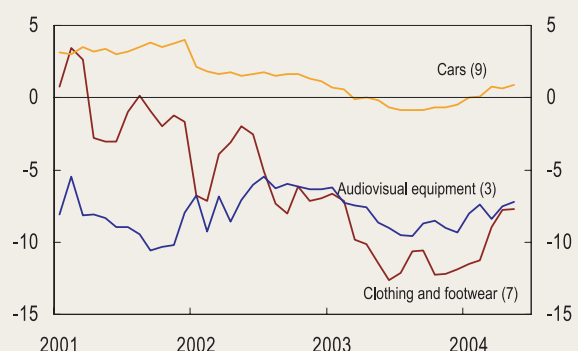

[1] Norges Bank's estimates up to and including July 2000, thereafter figures published by Statistics Norway
[2] Norges Bank's estimates

Sources: Statistics Norway and Norges Bank

Chart 2 Prices for some imported consumer goods[1]. 12-month rise. Per cent. January 2001 - May 2001

[1] Percentage share of CPI-ATE in brackets

Sources: Statistics Norway and Norges Bank

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unit labour costs in manufacturing and their export prices. Unit labour costs may thus also be an indicator of the external price impulses to Norwegian consumer prices. These figures are updated less frequently, however, and it is extremely difficult to ensure that the figures from different countries are comparable.

Aggregate indices will not necessarily capture the external rise in prices for imported consumer goods in Norway. First, a good measure of the rise in prices for imported consumer goods only reflects the rise in prices for the consumer goods that we import. The aggregate indices for trading partners' export and producer prices measure the prices for intermediate goods, capital goods and consumer goods. The indices thus contain a range of products that are not among the imported goods in the Norwegian consumer price index.

Second, foreign consumer and producer prices also include prices for goods that are supplied to the domestic market. These prices will thus be influenced by goods that are not traded internationally. Examples are newspapers and books. International trade of such goods is limited due to language barriers. Price developments for these goods among our trading partners therefore provide little information about foreign price impulses to the Norwegian economy.

Third, the traditional indicators for developments in prices for imported goods in foreign currency do not capture the effects of shifts in imports from high-cost to low-cost countries. The share of imports from low-cost countries[2] has increased from 5 per cent in 1990 to 13 per cent in 2003. Imports from China accounted for about ½ per cent of our imports in 1988. In 2002, this share had increased to 5½ per cent. This has dampened the external price impulses to the Norwegian economy.

External price impulses may also be measured on the basis of Norwegian statistics. External trade statistics include figures for changes in Norwegian import prices.

Import prices refer to actual merchandise imports and reflect any shift in imports from high-cost to low-cost countries. Norway imports consumer goods, capital goods and intermediate goods. Thus, the aggregate import price index will not necessarily reflect the direct impulses to imported consumer goods. In foreign trade, prices are calculated on the basis of imports measured by volume and value. Quality improvements are therefore not taken into account when calculating import prices. This makes it especially difficult to calculate import prices for audiovisual equipment, for example, which has gone down in weight at the same time as technological advances have been considerable. Import prices are measured in NOK and therefore do not directly reflect the externally generated price impulses to the Norwegian economy. They will also include the effects of changes in the krone exchange rate. The pass-through from the exchange rate to import prices is uncertain, partly because foreign exporters may set prices on the basis of the economic and competitive situation in Norway.

The traditional indicators seem to over-estimate the external price impulses to the Norwegian economy. Measured in terms of foreign producer and export prices, the price impulses have been approximately 1 per cent per year in the period 1997-2001. In the same period, prices for imported consumer goods in the CPI-ATE rose by 0.2 per cent per year, while the exchange rate on average remained approximately unchanged. The real external price impulses may have been even less pronounced than indicated by the rise in prices for imported consumer goods in the CPI-ATE. About half of the change in prices for imported consumer goods in the CPI-ATE is determined by domestic conditions such as wages and margins. Domestic wages and prices have generally increased more than prices for imported goods.

An alternative indicator

The increase in prices for different product groups in the imported consumer goods included in the CPI-ATE has varied considerably. Shifts in import patterns or strong productivity growth have had a substantial impact on some product groups. Since price formation seems to vary sharply from one product to another, we have chosen to base our indicator on the change in prices for individual product groups in the respective countries. This ensures that the composition of countries and goods in the index reflects actual imports. A disaggregated approach of this kind probably provides a better measure of the external price impulses than if we had used aggregate indices for export prices or producer prices (see Chart 4). Our work on the indicator has utilised earlier work related to the shift in imports for various goods. As early as 2002, Norges Bank calculated import

Chart 3 Consumer goods imports from Central Europe[1] and China as a share of total consumer goods imports. Per cent. Annual figures. 1990-2003[2].
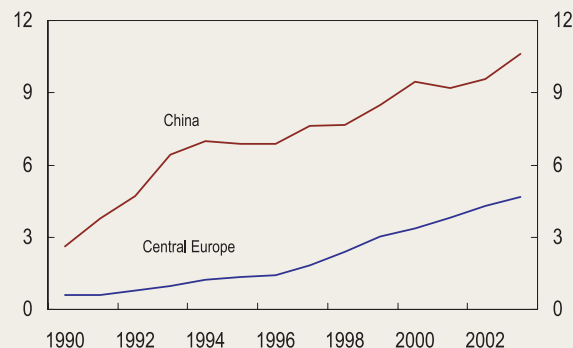

[1] Central Europe: Slovenia, Bulgaria, Czech Republic, Estonia, Latvia, Lithuania, Slovakia, Poland and Hungary
[2] Figures for 2003 from January to November

Source: Statistics Norway

[2] Low-cost countries are defined as Bulgaria, Estonia, Latvia, Lithuania, Slovenia, Turkey, Czech Republic, Bangladesh, Indonesia, India, Iran, Cambodia, Laos, Lebanon, Sri Lanka, Nepal, Malaysia, Philippines, Pakistan, Singapore, Hong Kong, China, South Korea, and Taiwan.

Chart 4 Prices for imported consumer goods in the CPI, producer prices among 25 trading partners and a new index for international price impulses to consumer goods. 1991 Q1 = 100. 1991 Q1 – 2004 Q1
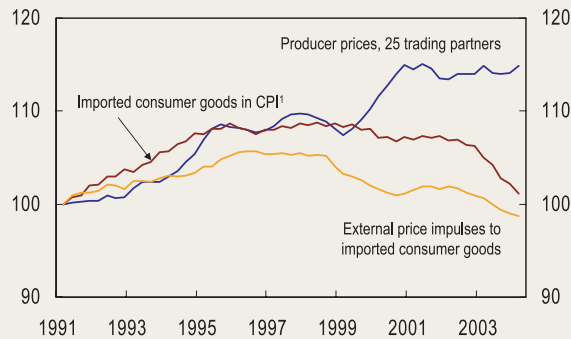
1 3-quarter moving average

Source: Norges Bank

Chart 5 External price impulses to consumer goods. Four-quarter rise. 1992 Q1 – 2004 Q1
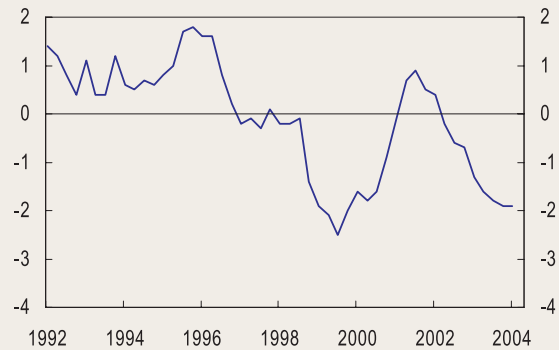
Source: Norges Bank

prices for clothing in order to explain the developments in clothing prices in Norway.[3]

The new indicator shows moderate external price impulses to Norwegian consumer goods through the first half of the 1990s, approximately on a par with that shown by traditional indicators for external price impulses (see Chart 5). This indicates that the shift towards low-cost countries was moderate and that the strong productivity growth for the production of some goods had not yet had a substantial impact on international prices. Prices for Norway's imported goods rose from 1995 to 1997. Strong economic growth probably provided considerable opportunities for foreign producers to increase prices in this period.

External price impulses, measured by the alternative indicator, eased in the period 1997 to 2001. In general, inflation was low among trading partners during this period, and the Asian crisis resulted in a decline in prices for a number of our imports. Developments were also influenced by an accelerating decline in prices for audiovisual equipment, reflecting strong productivity growth for the production of these goods. Clothing prices also fell as a result of increased imports from low-cost countries. This must be seen in connection with the dismantling of quota regulations and the reduction in tariff rates following the Uruguay Round in 1995. Compared with the US and the EU, Norway liberalised the trade of such goods relatively quickly. However, the decline in external price impulses moderated in 2001, reflecting higher oil prices and somewhat higher wage growth among trading partners. The shift in clothing imports towards low-cost countries was also modest in 2001. The global downturn led to a sharper fall in foreign prices from 2002. In addition, China's WTO membership from 2001 led to increased imports from China.

The alternative indicator

The indicator for external price impulses to imported consumer goods has been calculated as a weighted arithmetic average of the rise in prices for clothing, footwear, cars, audiovisual equipment, furniture and white goods, food and other goods (see equation 1 and 2).

$$(1) \quad P^t = P^{t-1}(1 + \Delta P^t)$$

$$(2) \quad \Delta P^t = \Delta P^t_{clothing}\alpha_{clothing} + \Delta P^t_{footwear}\alpha_{footwear} + \Delta P^t_{cars}\alpha_{cars} + \Delta P^t_{audiovisual}\alpha_{audiovisual}$$
$$+ \Delta P^t_{F\&W}\alpha_{F\&W} + \Delta P^t_{food}\alpha_{food} + \Delta P^t_{other}\alpha_{other}$$

P^t = Index for external price impulses to consumer prices at time t

ΔP^t_k = Rise in prices among trading partners in each of the k subgroups, $k = 7$ (see column 1 in Table 1)

$\alpha\kappa$ = Weight for subgroup k in the index (see column 2 in Table 1)

The sub-indices have been selected from approximately 20 product groups which are in the Norwegian consumer price index and may be purchased from abroad. Nevertheless, many of these products are for the most part manufactured in Norway. This is the case for beverages, tobacco products, books and newspapers. The weights of the seven sub-indices in the new indicator for external price impulses reflect the product groups' share of imported consumer goods in the CPI-ATE. In some cases, the weights have been adjusted in relation to the proportion of the product group that is imported (see Table 1). Nearly all cars, for example, are imported. The car index's weight in the indicator is therefore comparable to its weight in the CPI-ATE. However, some furniture consumption is covered by Norwegian produc-

[3] Høegh-Omdal and Wilhelmsen (2002)

tion. This product group's weight in the new indicator is therefore lower than its weight in the CPI-ATE. The weights are fixed and have been calculated on the basis of 2003 figures.

Table 1. Weights in the indicator for external price impulses to consumer prices (EPC)

	Weight in CPI-ATE	Weight in EPC
Audiovisual equipment	3%	11%
Clothing	6%	21%
Footwear	1%	4%
Cars	9%	32%
Food	11%	9%
Furniture and white goods	3%	7%
Other goods		16%
Total	33%	100%

Sources: Statistics Norway and Norges Bank

We need the following information about each product group in order to estimate international developments for each product group:

- how much we import from each country, i.e. import weights
- changes in producer prices among individual trading partners
- price level among trading partners

External trade statistics from Statistics Norway provide a good overview of the countries from which we import various products. Annual import weights for each product group are calculated on the basis of these statistics. Import patterns vary considerably from one product group to another. Cars, for example, are only imported from a handful of countries. Clothing and footwear, on the other hand, are imported from a range of countries. A number of these countries, China for example, are not normally defined as traditional trading partners.

Few countries publish *producer prices* broken down by sub-groups. It has only been possible to use producer prices in calculating the sub-indices for cars and food. We have used alternative price indices for the other product groups as an approximation of producer prices. The indices for audiovisual equipment and furniture and white goods are based on consumer prices for these goods in the countries from which we import the goods. Clothing and footwear are largely imported from low-cost countries with very limited price statistics. Overall consumer price inflation in these countries is therefore used as an approximation of producer prices. For "other goods", which includes a number of smaller product groups, we have set the rise in prices equal to the rise in export prices for goods among traditional trading partners.

Price levels vary considerably in the countries from

which we import goods. When the origin of a large portion of imports shifts from high-cost to low-cost countries, price developments will be affected by the difference in price levels among different trading partners. This price level effect is very small for many goods and may be disregarded. However, for some goods, the effect may be considerable. Therefore, the clothing and footwear index has explicitly taken price level effects into account. We assume that the variation in production prices for other product groups is limited, although price differences have probably also had an effect on audiovisual equipment.

A simple numerical example may show how differences in price levels among trading partners can affect external price impulses. In the case where we only import from two countries, the price level facing Norwegian importers is a weighted average of the price levels among the two trading partners (see equation 3). The change in the price level is designated as the external price impulse (see equation 4). Higher prices in both countries contribute in isolation to pushing up prices for Norway's imported goods. This is seen in the first two expressions on the right-hand side of the equation. In the case where imports shift from high-cost countries (country a) to low-cost countries (country b), the expression in the last term of the equation becomes negative.

$$3) \quad \bar{P}_{x,t} = P_{x,t}^a b_{x,t}^a + P_{x,t}^b (1 - b_{x,t}^a)$$

$$4) \quad \Delta \bar{P}_{x,t+1} = b_{x,t}^a \Delta P_{x,t+1}^a + (1 - b_{x,t}^a) \Delta P_{x,t+1}^b + \Delta b_{x,t+1}^a (P_{x,t+1}^a - P_{x,t+1}^b)$$

$P_{x,t}$ = Price level for imports of product group x at time t

$P_{x,t}^y$ = Price level for product group x in country y at time $t, y \in (a,b)$

$b_{x,t}^y$ = Import share from country y for product group x at time t

Δ = Change from period t to $t+1$

Ideally, price levels should reflect the cost of producing goods in different countries, for example, the wage level adjusted for the productivity level. It is difficult, however, to find comparable statistics for wage and productivity levels in the countries of particular interest, such as China. Therefore, we have based our price level calculations on estimates of purchasing-power-adjusted GDP figures from the World Bank.

Chart 6 shows developments in price levels in the various subgroups. The series have been calculated back to 1991 and are quarterly. It appears that prices for Norwegian imports may generally be divided into two groups. In the one group comprising clothing and audiovisual equipment, prices have fallen substantially. In the other group, the rise in prices has been approximately on

Chart 6 Projected external price movements for some imported consumer goods. Measured in trading partners' currencies. Quarterly figures. 1991 Q1 = 100. 1991 Q1 – 2004 Q1
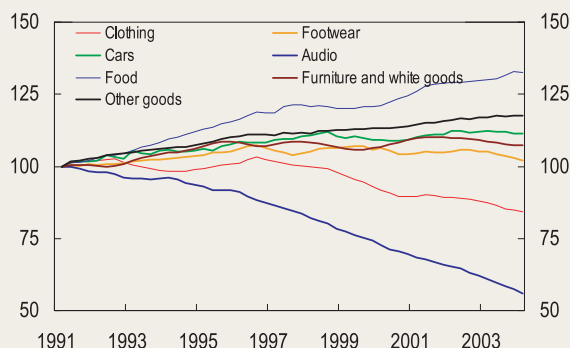
Source: Norges Bank

Table 2 Estimated price levels in some countries (Norway =1)

Norway	1.0	Greece	0.6
Denmark	1.0	Portugal	0.6
Sweden	1.0	Korea	0.5
UK	0.9	Lithuania	0.4
Finland	0.9	Turkey	0.4
France	0.9	Poland	0.4
Germany	0.9	Estonia	0.3
Hong Kong	0.9	Hungary	0.3
US	0.9	Thailand	0.3
Netherlands	0.8	Indonesia	0.2
Italy	0.8	China	0.2
Austria	0.8	India	0.2
Spain	0.7	Romania	0.2

Sources: World Bank and Norges Bank

a par with growth in unit labour costs in manufacturing among our traditional trading partners.

The usual measures for external price impulses develop over time in pace with unit labour costs in manufacturing among our traditional trading partners. Consequently, they do not capture the fall in prices for clothing and footwear that are a result of changes in trading patterns. Nor do the usual indices sufficiently reflect the fall in prices for audiovisual equipment.
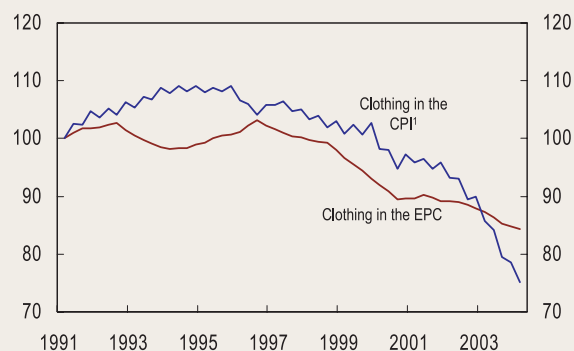
Developments in the indices

The fall in prices for clothing in foreign currency is primarily due to the shift in trade from high-cost countries to low-cost countries. International trade agreements have contributed to reducing trade barriers for textiles etc.[4] Norway was one of the first countries to remove quotas and reduce the general tariff rates on clothing. The last quotas were eliminated in 1998, while the average ordinary tariff rate has been reduced from about 20 per cent in 1994 to 12 per cent in 2004. The elimination of quota restrictions and reduced tariff rates have increased trade with countries outside the OECD area. About 18 per cent of clothing imports came from low-cost countries in 1991.[5] The corresponding figure in 2003 was 62 per cent. Our calculations show that the price level of Chinese products is less than half the price for the products that they indirectly or directly replace (see Table 2). The shift towards imports from China and other low-cost countries in the last decade has on average reduced the rise in clothing prices by about 3 percentage points per year. However, prices are being pushed up by the rise in prices among some of our trading partners. On the whole, the calculations indicate that import costs for clothing, measured in foreign currency, have fallen on average by 2 per cent per year. For footwear, the shift has been more moderate and the price fall has therefore been less substantial.

The fall in prices for clothing in the CPI-ATE corresponds largely to the calculated fall in prices among foreign producers of such goods (see Chart 7). Both curves show a relatively large shift in prices from 1995, reflecting, among other things, the signing of free-trade agreements with eastern European countries. Clothing prices in Norway have also been affected by reduced tariff rates and changes in the krone exchange rate.

Most countries experienced an accelerating fall in prices for audiovisual equipment in the 1990s. The costs of producing such goods have fallen substantially in the last decade. This may be due to the rapid spread of new production technology as well as strong international competition. Sweden and Germany are major exporters of electronic equipment. Therefore, consumer prices for audiovisual equipment in these countries are probably a good reflection of the costs of producing these goods (see Chart 8). In both countries, prices have been approximately halved in the last decade. Since 1995, prices

Chart 7 Prices for clothing in the CPI in Norway and abroad. Quarterly figures. 1991 Q1 = 100. 1991 Q1 – 2004 Q1

[1] 3-quarter moving average

Sources: Statistics Norway and Norges Bank

[4] The importance of trade policy to developments in clothing imports is discussed in Melchior (1993).

[5] Estonia, India, Indonesia, China, South Korea, Lithuania, Poland, Romania, Thailand, Turkey and Hungary.

Table 3 Weights and figures for the sub-indices in the EPC

	Weights	Rise in prices		Weights	Rise in prices
Audiovisual equipment	• Up to end-1994, weights from 1994 are used. Subsequently, the weights are updated annually. • 14 largest trading partners. These countries produce about 70 per cent of Norway's audiovisual equipment imports.	• CPI for audiovisual equipment for all countries except Japan. An average of prices for electrical machinery and leisure articles is used as an approximation for Japan.	Food	• An average of the weights in 2002 and 2003 are used for the entire period • 12 largest trading partners. These countries produce about 60 per cent of Norway's food imports.	• Producer prices for food
Clothing	• Annual weights. • 25 largest trading partners. These countries produce about 90 per cent of Norway's clothing imports.	• The overall CPI is used as an approximation of producer prices for clothing • The effects of the shift in trade are calculated on the basis of price levels in individual countries.	Furniture and white goods	• Up to end-1994, weights from 1994 are used. Subsequently, the weights are updated annually. • 14 largest trading partners. These countries produce about 80 per cent of Norway's furniture and white goods imports.	• CPI for furniture and white goods
Footwear	• Annual weights. • 25 largest trading partners. These countries produce about 90 per cent of Norway's footwear imports.	• The overall CPI is used as an approximation of producer prices for footwear. • The effects of the shift in trade are calculated on the basis of price levels in individual countries.	Other goods	• Weight reflects Norwegian imports of all goods. 2003 weights are used for the entire period. • Our 18 largest traditional trading partners	• Rise in export prices 3-quarter moving average
Cars	• Up to end-1994, weights from 1994 are used. Subsequently, the weights are updated annually. • 8 largest trading partners. These countries produce about 80 per cent of Norway's car imports.	• Producer prices for cars			

have fallen nearly 5 per cent annually. This is roughly in line with developments in Norway.

Car production depends on large investments in localised production facilities and high costs in connection with research and development. The car market is therefore characterised by a number of large players that have concentrated their production in a relatively limited number of countries. Because of the monopolistic competition in the car market, manufacturers have generally been able to pass on higher production costs to the consumer in the form of higher retail prices. Therefore, car prices largely follow growth in unit labour costs in the industry. The index rose steadily through the first half of the 1990s. After the Asian crisis, prices fell but have subsequently picked up somewhat.

Chart 8 Audiovisual equipment. Consumer prices in local currencies in Sweden, Germany and among trading partners. Monthly figures. January 1991 =100. January 1991 - May 2004
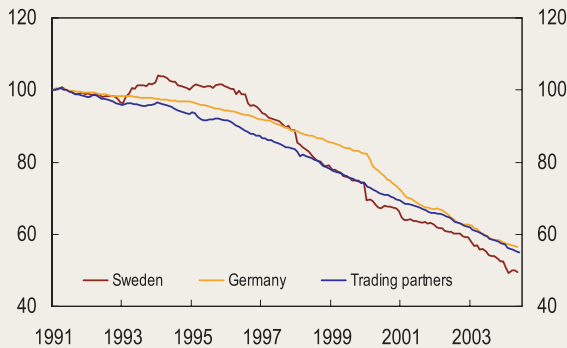
Source: Norges Bank

Concluding remarks

Imported goods account for 28 per cent of the CPI-ATE. However, consumer prices for imported goods are not only affected by external price impulses. Wage costs, margins and indirect taxes will also have a considerable effect. This means that the real direct external price impulses to the CPI-ATE are considerably less pronounced than implied by the 28 per cent. The domestic component for many goods will be more than 50 per cent.

There is uncertainty associated with the new indicator for external price impulses to Norwegian consumer goods. Technical problems are considerable. Among other things, it is difficult to estimate the exact effect of a shift in imports towards low-cost countries. The estimated price levels among trading partners may be incorrect. The price levels calculated by the World Bank are based on what goods and services consumers can purchase for a given amount in their country's own currency. This does not necessarily correspond to the producer prices for goods that the country exports. Goods manufactured for export are probably more capital-intensive than other goods included in total GDP in low-cost countries. The cost of manufacturing clothing, for example, would be higher than the cost of other production that is included in total GDP. Exporters from low-cost countries may also set prices somewhat lower than their competitors in order to win market shares. The price level for imports from low-cost countries may thus be higher than indicated by calculations based on purchasing-power-adjusted GDP.

On the other hand, the new indicator may overestimate the external price impulses, particularly as consumer prices among trading partners are used for many of the goods. Consumer prices also include a mark-up for wages and other domestic costs in distribution. These costs will generally rise at a faster pace than the purchase prices for the goods traded.

Another problem associated with using consumer prices instead of producer prices is that there is a time lag before changes in producer prices feed through to consumer prices. Actual external price impulses to the Norwegian economy may therefore arise before they are registered by the indicator.

Efforts are being made to improve the numerical data used in the indicator. It is desirable to replace consumer prices with producer prices, but at present there are no international databases which adequately split up producer prices by product groups. Price statistics in emerging economies, such as China, are inadequate, but the quality will improve over time. This will also contribute to the development of a more precise indicator for external price impulses.

On the whole, however, it would seem that the index provides a better picture of externally generated impulses to developments in prices for consumer goods in Norway.

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World Trade Organisation's website: www.wto.org