

# Rising food prices – a driving force behind inflation?

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Global food prices have risen sharply since the beginning of 2007. In this article, we look at the forces that may explain the rise in food prices both in Norway and abroad. The increase in food prices in Norway, as measured in the consumer price index, can be explained primarily by higher prices for domestically produced food, which are largely covered by the annual Agricultural Agreement. Food price inflation in Norway has been less pronounced than in other European countries due to our agricultural policy. Although price increases in Norway have been lower than in other countries, prices in Norway were higher at the outset. Looking ahead, there is reason to believe that the Agricultural Agreement, import restrictions, domestic cost inflation and competitive conditions will have a greater impact on food prices in Norway than global conditions, although developments abroad will have some influence.

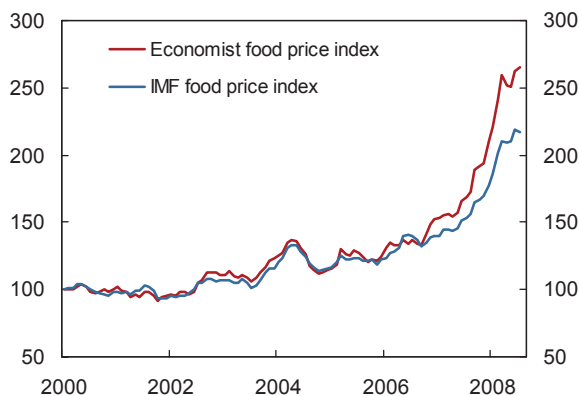
## 1 Introduction

The sharp rise in food prices has been a prominent feature of the global economy over the past two years. Increased biofuel production, higher demand from emerging economies, adverse weather conditions, rising energy prices and increased protectionism have pushed up prices for grain products and vegetable oils among others. Rising commodity prices affect prices for processed food, which has led to higher consumer price inflation.

In Norway, food accounts for around 10 per cent of the consumer price index. Higher food prices<sup>1</sup> will therefore be reflected in this measure of inflation. Food prices in Norway are primarily influenced by domestic factors, such as the annual Agricultural Agreement, the Norwegian import regime, and negotiations between grocery chains and food producers. However, global conditions will have some influence.

In this article, we look at the forces that may explain the rise in food prices both in Norway and abroad. We examine developments in global food prices and future expected price movements. We also look at how the Agricultural Agreement and the Norwegian import regime protect Norwegian food prices from global impulses. Finally, we look at how higher global food prices affect the inflation rate.

**Chart 1** Global food price indices. In USD. January 2000 = 100. January 2000 - July 2008



Sources: Thomson Reuters, *The Economist* and IMF

## 2 High global food prices

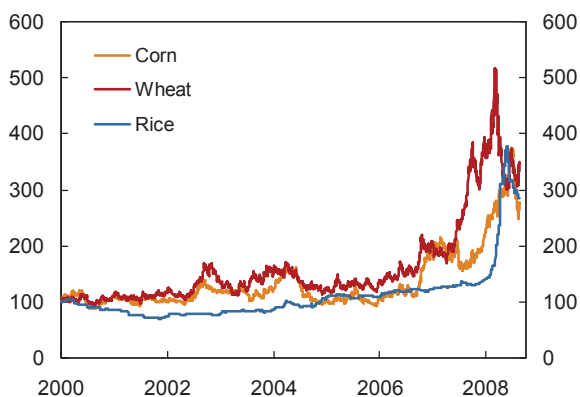
Global food prices have soared in recent years. From January 2007 to July 2008, The Economist's food price index climbed more than 70 per cent, and the IMF's food price index more than 50 per cent (see Chart 1).<sup>2</sup> Especially prices for wheat, corn, rice, soybeans and

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<sup>1</sup> By food price inflation in Norway, we mean the increase in food prices as measured in the consumer price index.

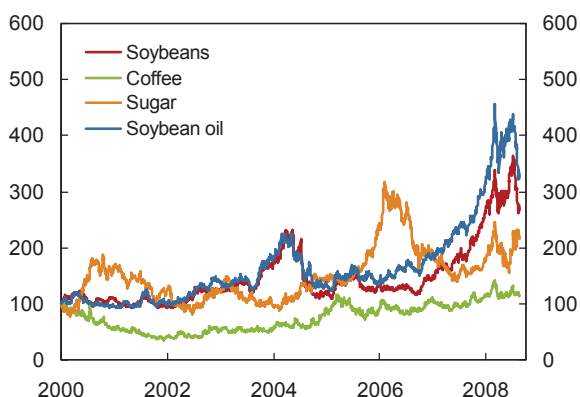
<sup>2</sup> Global food prices are measured in USD in this article. Prices have increased less in EUR and NOK: the increase in *The Economist's* food price index from January 2007 to July 2008 was 42 per cent measured in EUR and 38 per cent in NOK

**Chart 2a** Global food prices in USD. Index. 4 January 2000 = 100. 4 January 2000 - 15 August 2008



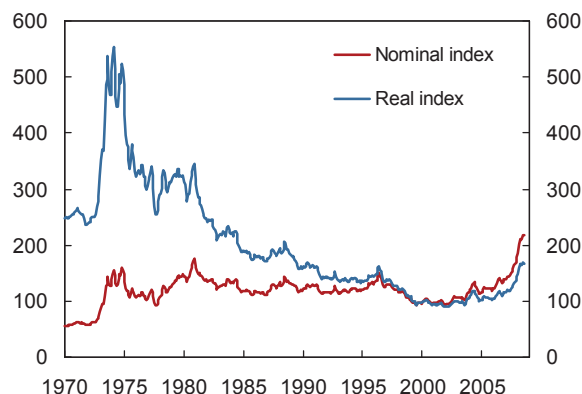
Source: Thomson Reuters

**Chart 2b** Global food prices in USD. Index. 4 January 2000 = 100. 4 January 2000 - 15 August 2008



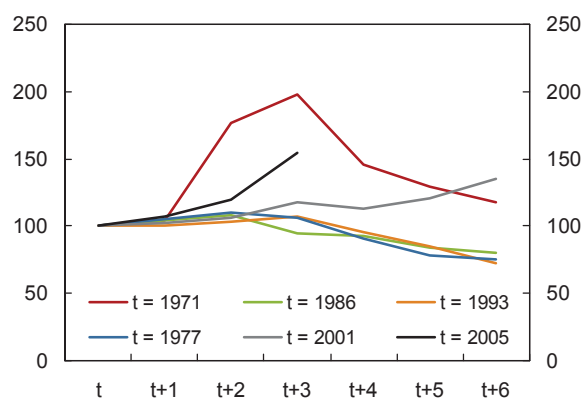
Source: Thomson Reuters

**Chart 3** IMF food price index in nominal and real terms. In USD. Real prices deflated by the US CPI. January 2000 = 100. January 1970 - July 2008



Sources: IMF, Thomson Reuters and Norges Bank

**Chart 4** Food price cycles. Based on the IMF food price index, converted into real values<sup>1</sup>. Index at trough (t) = 100. Annual figures<sup>2</sup>



<sup>1</sup>) Deflated by the US CPI.

<sup>2</sup>) Annual figure for 2008 is the average of monthly observations from January to July.

Sources: IMF, Thomson Reuters and Norges Bank

vegetable oils have risen sharply (see Charts 2a and 2b).<sup>3</sup> However, food prices have fallen back somewhat in recent months.

Food prices have also risen in real terms in recent years. Chart 3 shows movements in nominal and real prices since 1970. The increase in real prices came after a long period of falling prices. The decrease in real food prices in the 1980s and 1990s was partly due to productivity gains in the agricultural sector.

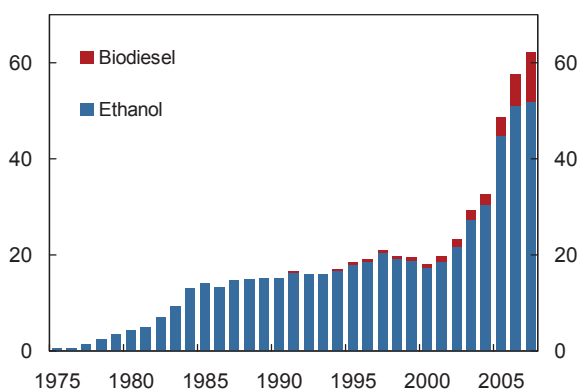
Three factors distinguish the current period of rising food prices from previous periods. First, prices have now increased for a wider range of food products. Grain, soybean and vegetable oil prices have all increased markedly. Second, prices have increased more than in previous periods of price upswings since the end of the

1970s (see Chart 4). Only the surge in the early 1970s was stronger than that in recent years. Third, this period of price increase has lasted longer than previous periods. Since 2001, food prices have been climbing almost continuously. Normally, food prices tend to fall back after a period of rising prices over two to three years.

The rise in food prices in recent years can be attributed to several factors: increased production of biofuels, higher demand from emerging economies, weather conditions, rising energy prices, and protectionist trade policy.

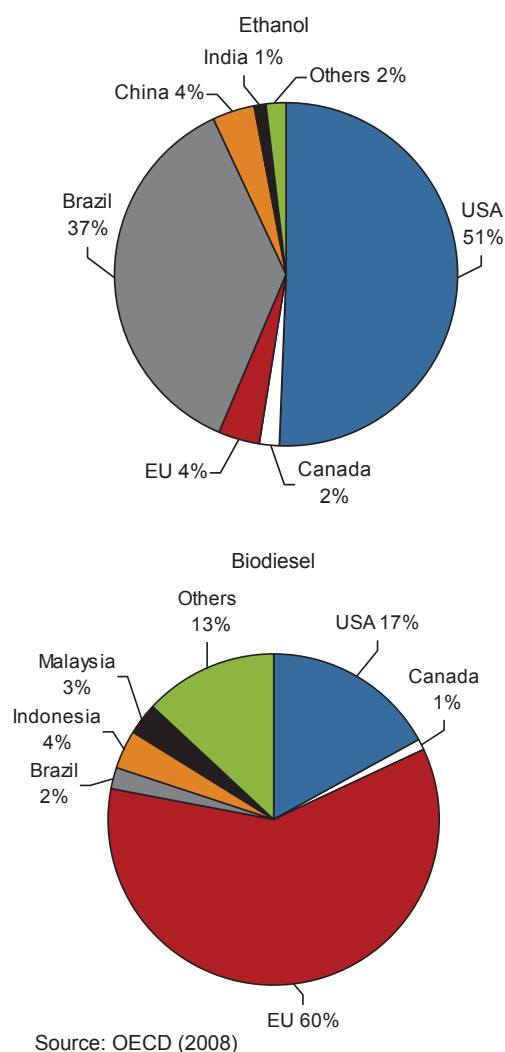
<sup>3</sup> In this article, global food prices refer to prices for food traded on the world market. Corn, wheat, soybean and soybean oil prices are those quoted on the Chicago Board of Trade (CBOT). Coffee and sugar prices are those quoted for Arabica and Sugar No. 11 on the IntercontinentalExchange (ICE). Rice prices are those for 100% Grade A White FOB Bangkok.

**Chart 5** Global biofuel production. Billion litres. 1975 - 2007



Sources: Earth Policy Institute, The Global Subsidies Initiative and OECD (2008)

**Chart 6** Breakdown of global biofuel production in 2007



Source: OECD (2008)

## 2.1 Increased production of biofuels

Global biofuel production has more than tripled since 2000 (see Chart 5). The main reasons for this sharp increase are higher oil prices and greater uncertainty about future oil supply, together with a more focus on carbon emissions, global warming and renewable energy. Biofuels can be divided into two main types: ethanol and biodiesel<sup>4</sup>. The US is the world's largest ethanol producer, followed by Brazil (see Chart 6). The EU is the largest producer of biodiesel.

A variety of food crops are used to produce biofuels. Sugar, corn and various other grain products are used in the production of ethanol, while biodiesel is produced mainly from vegetable oils. In 2007, 18 per cent of the US corn crop was utilised in domestic ethanol production. The amount of corn used to produce ethanol in the US has more than tripled since 2000. In 2006, roughly half of the sugar crop in Brazil went into the production of ethanol, while 40 per cent of the EU's rapeseed<sup>5</sup> crop went into the production of biodiesel. Increased demand for biofuels has led to higher prices for these agricultural products.

Rising prices for food that can be used to produce bioenergy have led to the cultivation of other agricultural products being displaced. The introduction of subsidies has additionally given farmers an incentive to adjust production in favour of food used in the production of biofuels.

The effect of replacing conventional fuels with biofuels has been discussed in recent years. Many point out that, with current technology, biofuels will not reduce emissions of greenhouse gases relative to fossil fuels to a large extent.<sup>6</sup> Questions have also been raised as to cost-effectiveness of biofuels, especially given the subsidies introduced in the US and the EU.

## 2.2 Increased demand from emerging economies

Food consumption is rising in emerging economies, and growth in food consumption was particularly high in the mid-1990s. Food consumption per capita<sup>7</sup> in emerging

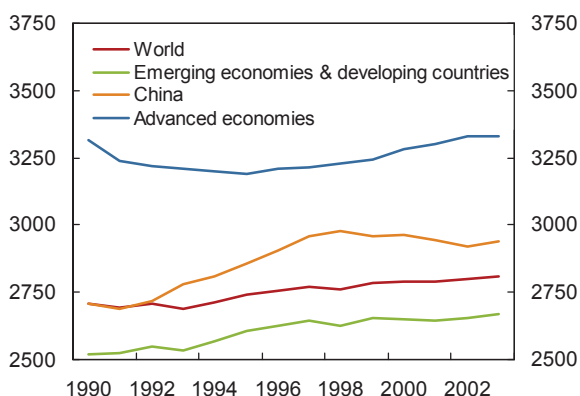
<sup>4</sup> Biodiesel is based on renewable raw materials and can be made from natural oils such as rapeseed, soybean and palm oil. Biodiesel has virtually the same properties as fossil diesel and can be used in diesel vehicles either on its own or mixed with ordinary diesel.

<sup>5</sup> Rapeseed is a cultivated plant with yellow blooms in the cabbage family. The oil pressed from its small black seeds is known as rapeseed oil and can be used as culinary oil. The meal left over is used in animal feed.

<sup>6</sup> See, for example, Doornbosh and Steenblik (2007) and IMF (2007).

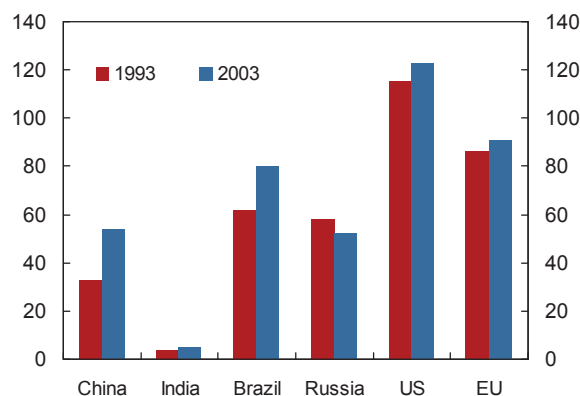
<sup>7</sup> Food consumption measured as calories per capita per day.

**Chart 7** Total food consumption. Calories per capita per day. 1990 - 2003



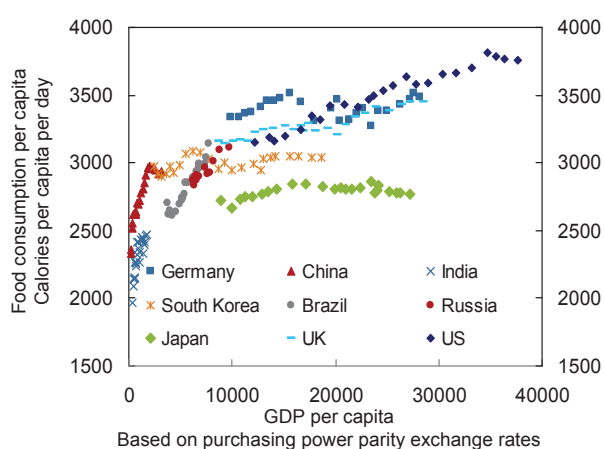
Source: FAOSTAT

**Chart 10** Meat consumption. Kilos per capita per year



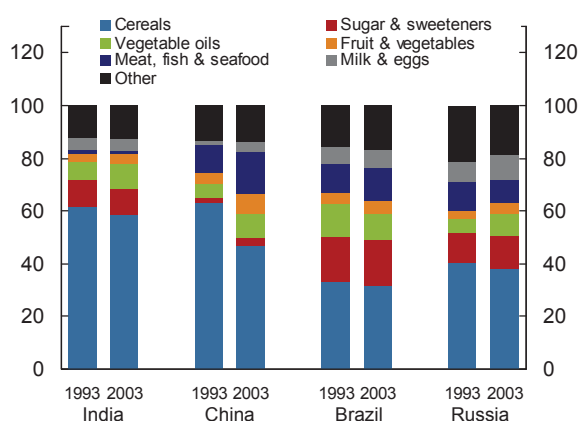
Source: FAOSTAT

**Chart 8** GDP and food consumption per capita. 1980 - 2003



Sources: FAOSTAT and IMF WEO database April 2008

**Chart 9** Food consumption in the BRIC countries broken down by food group. Per cent of total food consumption. Based on calories consumed per capita per day.



Source: FAOSTAT

economies and developing countries grew by 6 per cent from 1990 to 2003 (see Chart 7), with a particularly sharp increase in China. In industrial countries, food consumption per capita remained unchanged during the same period.

The strong growth in food consumption in emerging economies primarily reflects higher income. There is a positive relationship between GDP per capita and household food consumption (see Chart 8).<sup>8</sup> The number of calories consumed increases rapidly with income in emerging economies, before gradually levelling out as income reaches a certain level.

Rising income and higher standards of living in emerging economies have led to a more varied diet and a shift towards more protein-rich food. While most of their diet consisted of cereals in the 1990s, people in emerging economies are now consuming more meat, fish, eggs, dairy products, fruit, vegetables and vegetable oils (see Chart 9).

Meat consumption, especially in China and Brazil, has increased sharply (see Chart 10). The BRIC countries<sup>9</sup> accounted for 40 per cent of global meat consumption in 2003, up from 33 per cent in 1993. The BRIC countries accounted for more than 60 per cent of the increase in global meat consumption from 1993 to 2003, with China making the single largest contribution.

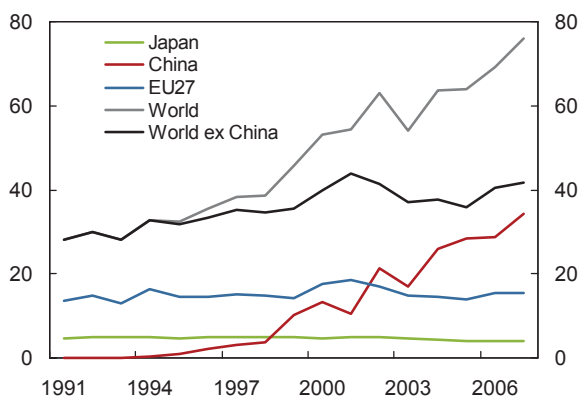
Higher meat consumption leads to higher consumption of animal feed.<sup>10</sup> Global trade in soybeans, which can be used as animal feed, has grown substantially since the early 1990s. China is now the world's largest importer

<sup>8</sup> This pattern follows Engel's law (Ernst Engel (1821–1896), German statistician), according to which, families will spend a smaller proportion of their income on food as their income/consumption increases.

<sup>9</sup> The BRIC countries are the four largest emerging economies: Brazil, Russia, India and China.

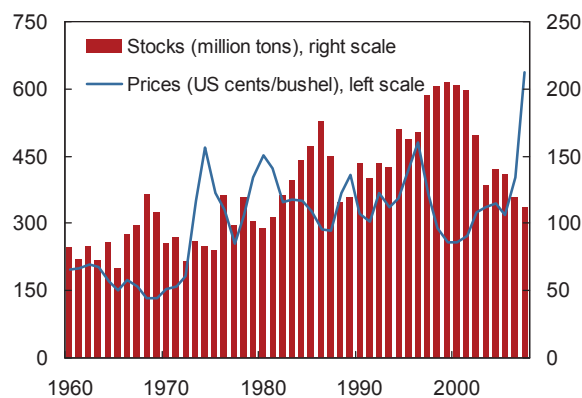
<sup>10</sup> As the consumption of meat rises, demand for grain and other animal feed used to produce meat grows more quickly as several kilos of animal feed are needed to produce one kilo of meat. Feed-to-meat conversion rates vary widely and depend on the type of meat production and the production method. The USDA (Trostle, 2008) estimates that the upper bounds for these conversion rates are as follows: 7 kilos of grain to produce a kilo of beef, 6.5 kilos for a kilo of pork, and 2.6 kilos for a kilo of chicken.

**Chart 11** Soybean imports. Millions of tons. 1991 - 2007



Sources: US Department of Agriculture (USDA) and Norges Bank

**Chart 12** Global wheat stocks and prices. 1960 - 2007



Sources: Thomson Reuters, Australian Commodity Statistics 2007 and ABARE (2008)

of soybeans and has accounted for most of the increase in global imports of soybeans (see Chart 11). Soybean prices more than doubled from January 2007 to July 2008. China's membership of the WTO in December 2001 enabled this rise in imports.

The populations in emerging economies are also growing. With more mouths to feed, demand for food continues to grow.

### 2.3 Supply-side factors

While food demand has increased considerably in recent years, the supply of food has not increased to the same extent. This is due partly to failed harvests. Australia has experienced severe droughts for several years in a row, and bad weather also damaged the wheat crops in the US and Europe in 2007. Among the world's five largest wheat exporters, production fell by altogether 12 per cent from the 2005/06 marketing year to the 2006/07 marketing year.<sup>11</sup> Wheat inventories have fallen sharply (see Chart 12). Wheat prices climbed more than 70 per cent from January 2007 to July 2008, despite a steep drop in prices since March this year.

Rising energy prices have led to higher production costs in the agricultural sector. Oil prices climbed from less than USD 60/barrel at the beginning of 2007 to more than USD 130/barrel in July 2008, but have fallen back somewhat in recent months. Higher oil prices have led most notably to higher fertiliser prices. The cost

of storing, transporting and distributing food has risen sharply as well.

The introduction of trade restrictions has also contributed to higher food prices. In the first half of 2008, several countries introduced export restrictions to protect domestic markets from high global food prices. India, China, Vietnam, Cambodia and Egypt, which all introduced restrictions on exports of rice in spring 2008, accounted altogether for more than 40 per cent of global rice exports in the 2006/07 marketing year. Rice prices on the world market more than doubled in the first half of 2008.

### 2.4 Outlook for global food prices

Global growth in food demand will probably remain high for several years to come. Higher income in emerging economies will probably result in continued strong demand growth for food in these countries. The effects on future food prices will be particularly pronounced if strong demand for food is combined with limited spare production capacity, pressure on the available land, global warming<sup>12</sup> and increased biofuel production. In addition, more protectionist agricultural and trade policies may lead to a further tightening of global food markets.

On the other hand, a change in biofuel policy or the development of competitive second-generation biofuels<sup>13</sup> could ease the pressure on food prices. Higher agricultural output as a result of increased productivity or the cultivation of new areas of land could also result

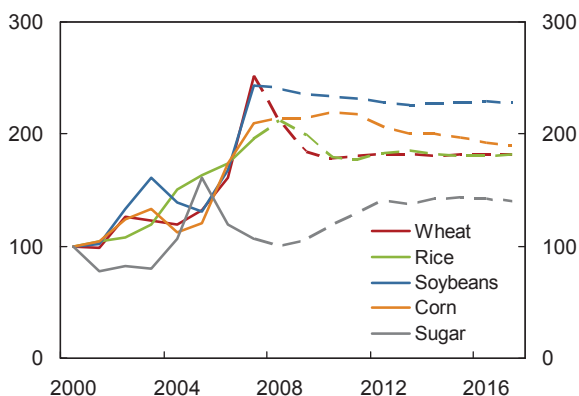
<sup>11</sup> The world's five largest exporters of wheat in the 2006/07 marketing year were the US, Canada, the EU, Australia and Argentina.

<sup>12</sup> Climate change and global warming may have significant effects on future agricultural output. The UN Intergovernmental Panel on Climate Change (IPCC) estimates that potential food production in northern and southern latitudes could increase slightly with a rise in average temperature of 1–3°C, whereas a rise in average temperature of more than 3°C would lead to a decrease in food production in these regions. Closer to the equator, even a moderate increase in temperature would result in a decrease in agricultural output. Overall, an increase of 3°C or more could lead to a drop in global food production (Easterling et al., 2007).

<sup>13</sup> Second-generation biofuels will be produced mainly from plant matter, wood and related waste products. The raw materials for this type of biofuel will not compete to the same extent with food production.

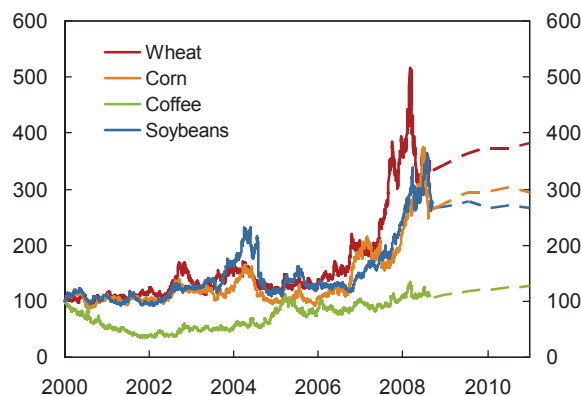


**Chart 13** Outlook for global food prices. In USD. OECD-FAO projections for 2008 to 2017. Index, 2000 = 100. 2000 - 2017



Sources: OECD-FAO (2008), USDA, Australian Commodity Statistics and Norges Bank

**Chart 14** Food prices in USD. Index, 4 January 2000 = 100. 4 January 2000 to 15 August 2008. Forward prices from 15 August 2008 (dashed lines). September 2008 - December 2010



Sources: Thomson Reuters, Chicago Board of Trade, IntercontinentalExchange and Norges Bank

in lower prices. The OECD and the UN's Food and Agriculture Organisation present in their annual report the outlook for agricultural markets over the next decade (OECD-FAO, 2008). They predict that food prices will fall somewhat in the near term as more normal weather conditions, increased productivity in the agricultural sector and more efficient land use will to some extent offset higher demand growth (see Chart 13). However, OECD-FAO predicts that food prices will not return to the levels of the late 1990s, but remain high through to 2017.

Global food prices have fallen somewhat in recent months due to a more favourable outlook for this year's harvests. Forward prices suggest that market participants anticipate a small increase in global food prices in the years to come (see Chart 14).

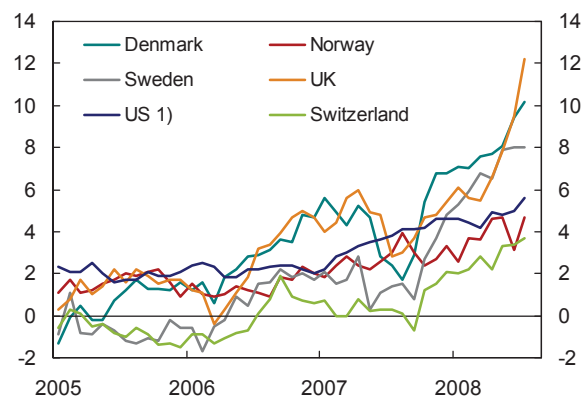
Although global food inflation is expected to ease in the coming years and perhaps turn negative, the feed-through to more processed food will persist for some time.

### 3 Factors behind food price movements in Norway

The rise in food prices in Norway has been considerably less pronounced than on the world market. Chart 15 compares food price inflation in Norway with developments in Denmark, Sweden, the UK, the US and Switzerland. Food prices have increased considerably less in Norway and Switzerland than in the other countries. This is most likely because agricultural policy in Norway and Switzerland to a greater extent shields domestic food prices from fluctuations in external prices.

Although the rise in food prices has been less pronounced in Norway than in other countries, they have still increased fairly sharply over the past year. Food prices were around 5 per cent higher in July 2008 than

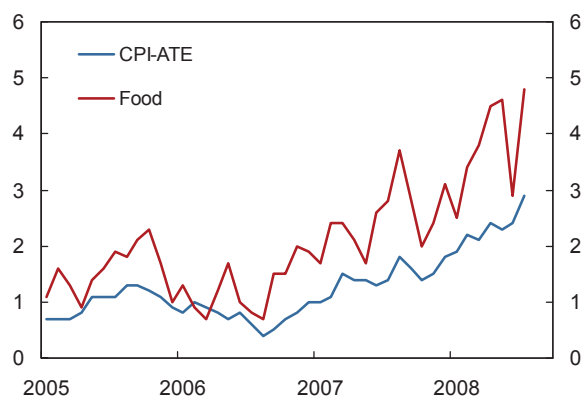
**Chart 15** Movements in prices for food and non-alcoholic beverages in the CPI in selected countries. Year-on-year change. Per cent. January 2005 - July 2008



<sup>1)</sup> For the US, the food and beverages index has been used.

Source: Thomson Reuters

**Chart 16** Movements in the CPI-ATE<sup>1)</sup> and the food subgroup. Year-on-year change. Per cent. January 2005 - July 2008



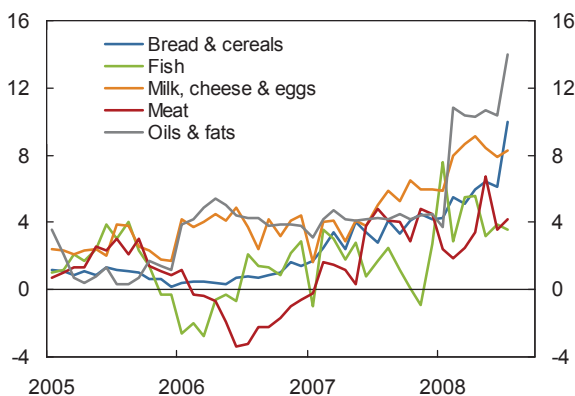
<sup>1)</sup> Consumer price index adjusted for taxes and excluding energy products

Source: Statistics Norway

in July 2007, and food prices have increased more than prices for other goods (see Chart 16).

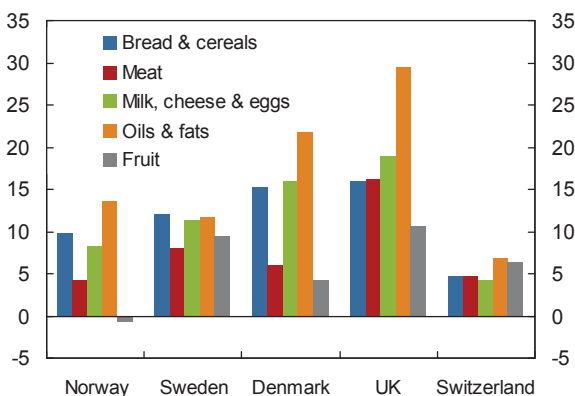
Of the food included in the consumer price index, oils

**Chart 17** Movements in prices for food and non-alcoholic beverages in the CPI. Year-on-year change. Per cent. January 2005 - July 2008



Source: Statistics Norway

**Chart 18** Movements in food prices in selected countries. Year-on-year change. July 2008



Sources: Thomson Reuters and Eurostat

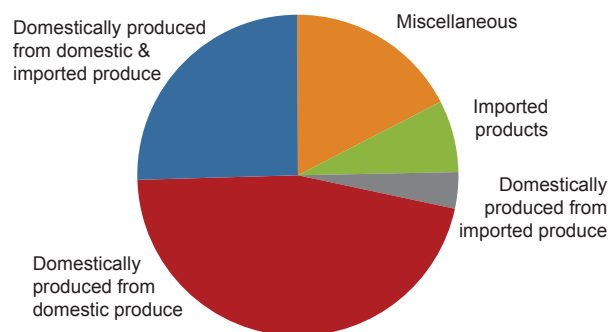
and fats have increased most in price over the past year. Prices for milk, cheese and eggs and for bread and cereals have also risen (see Chart 17). However, prices in most of these food groups have increased to lesser extent in Norway than in many other countries (see Chart 18). Moreover, unlike in other countries, fruit and vegetable prices have decreased in Norway. This was probably due to competitive conditions – for example, several grocery chains ran cut-price fruit and vegetable campaigns during the summer.

### 3.1 Impact of the agricultural settlement and the Norwegian import regime

Agricultural policy is the main reason why food prices have shown a less pronounced rise in Norway than in neighbouring countries and other European countries.<sup>14</sup>

<sup>14</sup> Although food price inflation in Norway has been lower than in other countries, price levels in Norway were higher at the outset. This is discussed further later in the article.

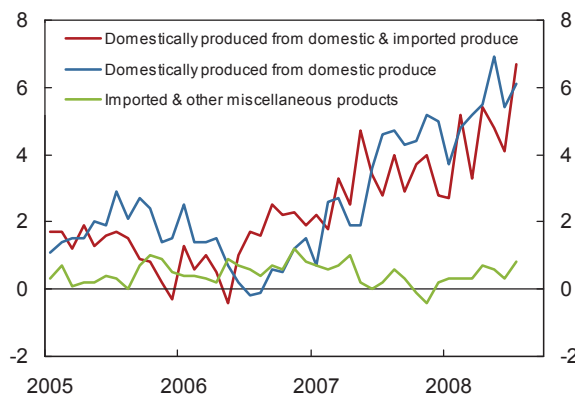
**Chart 19** Food and non-alcoholic beverages in the CPI by origin<sup>1)</sup>. Weighting in CPI food index



<sup>1)</sup> Fish products are not included.

Sources: Statistics Norway and Norwegian Agricultural Economics Research Institute (NILF)

**Chart 20** Movements in food prices in Norway. Year-on-year change. Per cent. January 2005 - July 2008

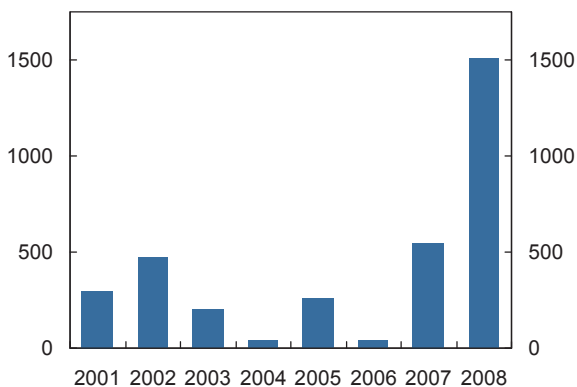


Sources: NILF and Norges Bank

It is primarily food products produced in Norway using domestic inputs or using a mixture of domestic and imported inputs that have increased most in price. These are largely covered by the annual Agricultural Agreement and account for most of the food products in the consumer price index (see Chart 19).

Prices for food produced in Norway using domestic inputs were around 6 per cent higher in July this year than in July last year. Prices for food produced domestically using a mixture of domestic and imported inputs increased similarly, if not slightly more (see Chart 20). Prices for imported food, on the other hand, have been relatively stable. Imported food are more exposed to fluctuations in global prices, but account for a relatively small proportion of the food in the consumer price index and so do not contribute notably to overall inflation. Prices for imported food and other miscellaneous

**Chart 21** Change in farmers' income due to higher target prices in the annual agricultural settlement. Millions of NOK. Current prices. 2001 - 2008



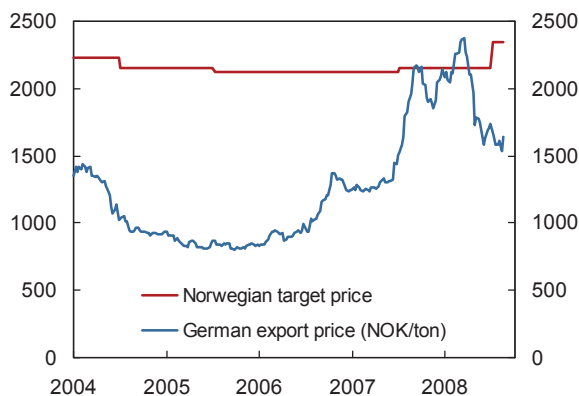
Source: Norwegian Ministry of Agriculture and Food

products were 0.8 per cent higher in July 2008 than a year earlier. The increase in food prices in Norway can therefore be attributed mainly to higher prices for domestically produced food such as meat, milk, eggs, fruit, vegetables and cereals. Prices for these food products – or for most of the inputs used in their production – are set in the annual Agricultural Agreement through target prices.

According to the Norwegian Agricultural Authority (SLF), these target prices are intended to be the prices that farmers can obtain based on the import and regulation system that we have in Norway. The target prices normally apply from 1 July in the year of the settlement until 30 June in the following year, and effectively put a ceiling on prices that farmers can obtain for their products. The SLF checks that prices for agricultural products do not exceed the target prices. If this occurs, the customs duties on imports of agricultural products are lowered so that prices for Norwegian products fall back.

The 2008 Agricultural Agreement granted farmers an increase in potential income of NOK 1.9 billion. This included an increase in target prices of NOK 1.5 billion. This means that the price ceiling has been raised, and farmers increase their prices by a total of up to NOK 1.5 billion. This increase in target prices meant that agricultural commodity prices increased by NOK 870 million on 1 July this year and will increase by a further NOK 635 million from 1 January 2009. The increase in July this year contributed to a year-on-year increase in prices for food included in the consumer price index of as high as 4.8 per cent that month. That was the highest year-on-year increase since February 1999, when prices jumped up 4.9 per cent. If we compare the increase in target prices in this year's agricultural settlement with settlements in previous years, we see that the 2008 settlement entailed a much larger increase in target prices (see Chart

**Chart 22** Milling wheat prices. NOK per ton. Week 1 2004 - week 33 2008



Sources: International Grains Council and Norwegian Agricultural Authority (SLF)

21). The Ministry of Agriculture and Food has estimated that the increase in agricultural commodity prices as a result of this year's agreement will, in isolation, push up the consumer price index by a quarter of a percentage point on an annualised basis. The food component of the consumer price index is expected to increase by 2¼ per cent on an annualised basis, while domestically produced agricultural products<sup>15</sup> are expected to rise by 3¼ per cent as a result of the settlement.

Norwegian agricultural commodities covered by the Agricultural Agreement are protected from international competition with the help of customs duties. Imports of these products into Norway are therefore limited. Imported products that compete with Norwegian products whose production makes use of imported inputs have lower customs duties. For some products that are not produced in Norway, there are low or zero customs duties. Prices for products with low or zero customs duties will fluctuate more with world market prices than prices for Norwegian agricultural products, but they do not influence inflation to the same degree as prices for Norwegian agricultural products because they have a small weighting in the consumer price index.

Although external prices for agricultural products have increased sharply in the past couple of years, Norwegian target prices are mostly still well above the world market price. Chart 22 shows movements in milling wheat prices in the EU (measured by the German export price) and the target price for milling wheat in Norway since 2004. During this period, the Norwegian target price has been substantially higher than external prices, except for a period in September 2007 and March 2008. Since then, world market prices have fallen back again to below the Norwegian target price.

Although food prices have increased less in Norway as in other countries, the price level in Norway is higher. Food prices in Norway are approximately 50 per cent

<sup>15</sup> The index for domestically produced agricultural products is based on NILF's division of food products in the consumer price index by supplier sector.



**Table 1** Food prices' contribution to increase in consumer price index

	CPI Year-on-year increase July 07 to July 08	Food in CPI Year-on-year increase July 07 to July 08	Food's share of CPI Per cent	Food's contribution to increase in CPI over the past 12 months
Norway	4.3	4.8	10.3	0.5
Sweden	4.4	8.4	11.8	1.0
Denmark	4.0	10.2	11.0	1.1
Switzerland*	3.1	3.7	11.1	0.4
UK	4.4	13.7	9.5	1.3
EU25	4.4	8.3	14.6	1.2
US	5.6	6.0	13.8	0.8

\* Includes beverages.

Sources: Thomson Reuters and Norges Bank.

higher than those in the EU, largely because of agricultural policy. Norwegian prices for most food, with the exception of fish, are also substantially higher than those in Denmark, Sweden and the UK (see Chart 23).

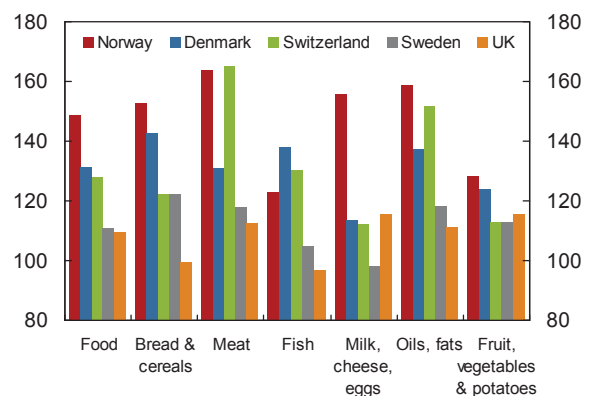
A further rise in Norwegian food prices is expected ahead. Target prices will increase again from 1 January 2009. After that, the outcome of next year's agricultural settlement remains to be seen. Other factors also affect food prices. Due to the focus on high food prices in Norway, it may have been easier for grocery chains to raise their retail prices further than the increase in agricultural commodity prices would justify. The chains may therefore have increased their margins. On the other hand, wage growth has been relatively high and energy prices have soared. This has probably led to higher costs for the grocery chains, which may, in turn, have fed through to food retail prices.

## 4 Effects of higher food prices on inflation at home and abroad

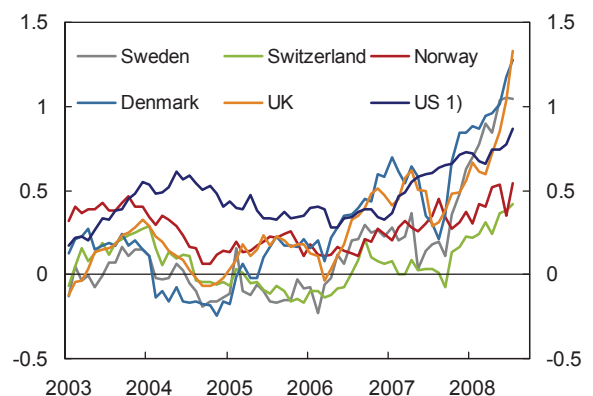
### 4.1 Direct effects

High global food prices have led to higher inflation in many countries. Food accounts for approximately 10–15 per cent of the consumer price index in the countries with which Norway tends to be compared (see Table 1). Food prices' contribution to consumer price inflation has increased significantly in the past year (see Chart 24). In the EU and the US, the contribution from food to the year-on-year rise in the consumer price index has been 0.8–1.3 percentage points. The contribution from food in Norway and Switzerland has been lower.

In emerging economies and developing countries, food accounts for a larger share of household expenditure than in the OECD countries and therefore has a higher

**Chart 23** Comparable consumer prices for different foods. Price level in EU15 = 100. Price levels in other European countries indexed accordingly. 2007

Source: Eurostat

**Chart 24** Contribution to CPI inflation from food and non-alcoholic beverages. Percentage points. January 2003 - July 2008

1) For the US, the food and beverages index has been used.

Sources: Thomson Reuters and Norges Bank

weighting in the consumer price index. Food consumption in emerging economies also includes large proportions of cereals and other agricultural commodities. As a result, an increase in prices for these commodities

will have a greater impact on food prices in developing countries than in the industrial countries. Consumer price inflation has therefore been higher in emerging economies and developing countries than in the OECD (see Chart 25).

#### 4.2 Indirect effects

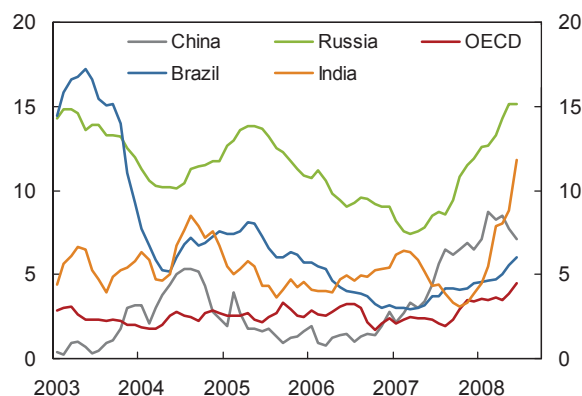
Owing to higher food prices, food products have become more expensive relative to other consumer goods. Milton Friedman (1975) argued that changes in the relative price of a good, such as food, will not necessarily lead to higher overall inflation. Increases in food prices will, in isolation, reduce households' real income and, therefore, their demand for other goods and services. This suggests a lower rise in prices for other goods and services, so that the overall consumer price index will not necessarily rise to a considerable extent.

However, higher food prices may have a more indirect effect on inflation. Owing to rigidities in price formation, it can take time for the rise in prices for other goods and services to slow as Friedman predicts. The increase in the consumer price index may therefore be higher for a period than earlier. It is normal to assume that economic agents are forward-looking when making decisions. If wage-earners anticipate high inflation, they will demand higher wages than if they expect low inflation. Likewise, enterprises will raise their prices further if they anticipate high inflation. Consumers' inflation expectations can be affected by changes in the consumer price index today. Higher food prices can, therefore, put pressure on other prices and wages via higher inflation expectations.

In countries with an inflation target and monetary policy credibility, the inflation target is in itself an anchor for inflation expectations. If there is reason to believe that high food price inflation will persist, or that it will affect inflation expectations, it will be appropriate to tighten monetary policy. This may, for example, prevent second-round effects in the form of higher wage demands and a rise in prices for other goods.

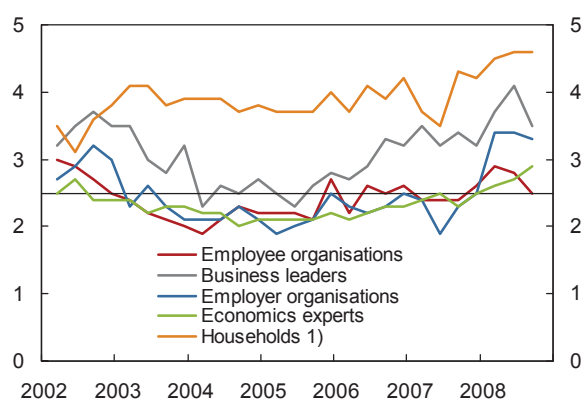
The actual inflation expectations that underlie the representative agent's behaviour are not directly observable. However, a number of indicators can provide information about developments in expectations. Charts 26a and 26b show inflation expectations in Norway two and five years ahead based on surveys.<sup>16</sup> Inflation expecta-

**Chart 25** Year-on-year change in the CPI in the OECD and key emerging economies. Per cent. January 2003 - June 2008



Source: Thomson Reuters

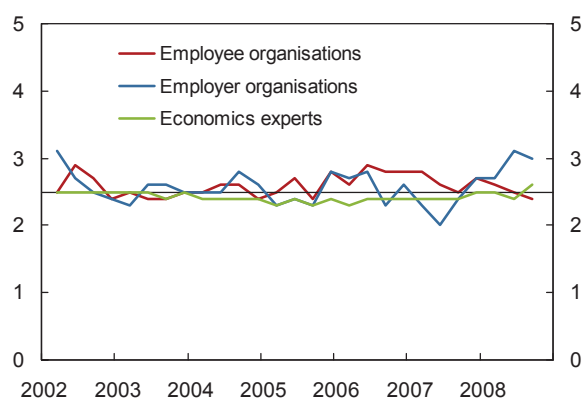
**Chart 26a** Inflation expectations two years ahead in Norway. Per cent. Q1 2002 - Q3 2008



1) Households' expectations of inflation two to three years ahead.

Source: TNS Gallup

**Chart 26b** Inflation expectations five years ahead in Norway. Per cent. Q1 2002 - Q3 2008



Source: TNS Gallup

tions two years ahead have increased somewhat in recent quarters and are now above the 2.5 per cent inflation target. Business leaders' inflation expectations are par-

<sup>16</sup> Inflation expectations from TNS Gallup's expectations survey. Economics experts and labour market organisations are asked the following question about expected future inflation: "What do you think the general rate of inflation in the prices of goods and services will be in two (five) years, as measured by year-on-year growth in the CPI?" Business leaders are asked: "What do you think inflation will be in two years?" Households are asked: "What do you think the general rate of inflation will be in two to three years, in per cent?" For further information about the expectations survey, see [www.tns-gallup.no](http://www.tns-gallup.no).

ticularly high. Inflation expectations five years ahead, on the other hand, have been relatively stable around the 2.5 per cent inflation target in recent quarters. However, the rise in inflation expectations is not due solely to the increase in food prices. Higher energy prices and increased wage pressures have also played a role.

In other countries, where food prices have increased considerably more than in Norway and have pushed inflation up to a greater degree, it would seem that inflation expectations have risen somewhat in recent quarters. Sweden in particular stands out on the high side, while inflation expectations have been relatively stable in the US and the euro area (see Chart 27).<sup>17</sup>

Inflation expectations can also be calculated using financial market variables. Chart 28 shows implied five-year inflation expectations five years ahead in the UK, the euro area and the US based on inflation swaps.<sup>18</sup> Long-term implied inflation expectations have trended upwards in the UK and, to a lesser extent, the euro area in recent months, while expectations have been relatively stable in the US. In the UK, food prices have by far made the largest contribution to year-on-year CPI inflation; the contribution in the US has been smaller (see Table 1 and Chart 24). One would therefore expect the high contribution from rising food prices to have pushed up inflation expectations in the UK. The Bank of England's August 2008 Inflation Report notes that both one-year and longer-term inflation expectations have risen. This may be because prices for food and energy have risen markedly within a relatively short period, and these are products that households rely on and purchase often. This means that an increase in these prices will be very noticeable and easily affect household budgets.

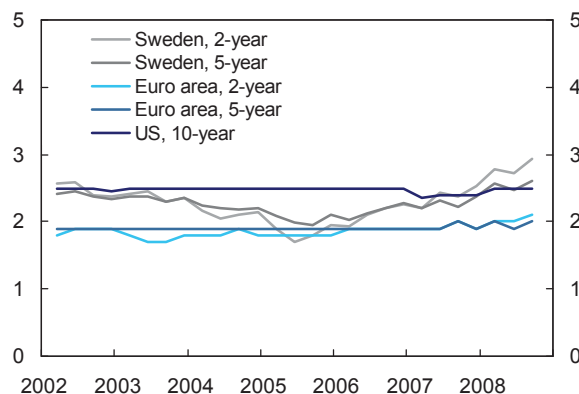
## 5 Conclusion

Global food prices have risen sharply since the beginning of 2007. High food prices reflect several conditions. Increased biofuel production and higher food consumption in emerging economies have boosted demand for food. Adverse weather conditions and higher energy prices have curbed growth in food production. Several

countries have also introduced export restrictions to protect domestic markets from high food prices.

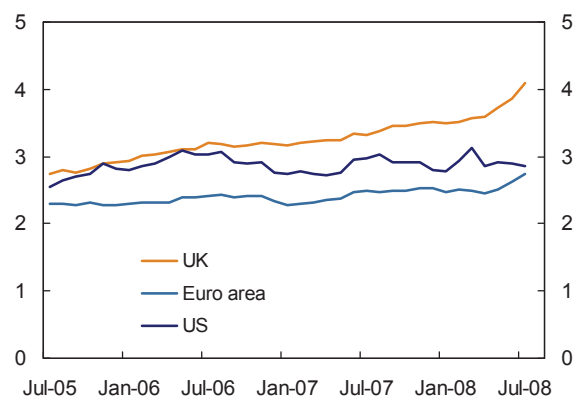
The outlook for global food prices is highly uncertain. More normal weather conditions, increased productivity in the agricultural sector and more efficient use of crops may compensate for continued strong demand growth and lead to reduced prices. However, food prices will probably remain high in the years to come due to con-

**Chart 27** Inflation expectations abroad. Per cent. Q1 2002 - Q3 2008



Source: Thomson Reuters

**Chart 28** Inflation expectations abroad. Implicit five-year inflation expectations<sup>1)</sup> five years ahead. Per cent. July 2005 - July 2008



<sup>1)</sup> Implicit five-year inflation expectations five years ahead can be interpreted as inflation expectations for the five-year period starting in five years' time. Inflation expectations based on inflation swap data from Bloomberg.

Source: Bloomberg and Norges Bank

<sup>17</sup> The inflation expectations in Chart 27 are not directly comparable. The inflation expectations for Sweden are taken from TNS Prospera (reproduced by Thomson Reuters). The panel was asked about expected CPI inflation over the coming two/five years (average expected inflation over the period). The inflation expectations for the US are taken from the Federal Reserve Bank of Philadelphia's Survey of Professional Forecasters (reproduced by Thomson Reuters). The panel was asked about expected CPI inflation over the next ten years. The inflation expectations for the euro area are taken from the ECB's Survey of Professional Forecasters (reproduced by Thomson Reuters). The panel was asked about point estimates for expected inflation five years ahead. Thus the indices for Sweden and the US also cover short-term inflation expectations and will therefore fluctuate more with current inflation.

<sup>18</sup> Implied five-year inflation expectations five years ahead denote the expected average annual rate of inflation over the five-year period starting in five years' time. These are calculated to filter out inflation expectations for the next five years. Inflation expectations for the next five years are an average for those years and will therefore be affected to a greater extent by current inflation levels than inflation expectations over the five-year period starting in five years' time. Implied inflation will therefore give a more precise estimate of expectations further ahead.

tinued strong growth in demand for food in emerging economies and competition from biofuels.

Food price inflation in Norway, as measured in the consumer price index, can be explained primarily by higher prices for domestically produced food. Prices for these food products – or the commodities used in their production – are largely covered by the annual Agricultural Agreement. These products are therefore to some extent shielded from global price fluctuations through customs barriers. Food price inflation has therefore been far less pronounced in Norway than in other countries, although price levels were higher in Norway at the outset. Looking ahead, there is reason to believe that the Agricultural Agreement, domestic cost increases and competitive conditions will have a greater impact on movements in food prices in Norway than global conditions, although developments abroad will have some influence.

High global food prices have led to increased consumer price inflation in many countries. Food prices' contribution to consumer price inflation has increased substantially in the past year. In Norway and Switzerland, food prices have to a lesser extent pushed up inflation than in other European countries in the past year. In emerging economies and developing countries, consumer price inflation has been higher than in the OECD. Food accounts for a larger proportion of household expenditure in those countries. Inflation expectations seem to have picked up in recent months, both in Norway and in other countries.

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