

## Deflation - an outline of the problems

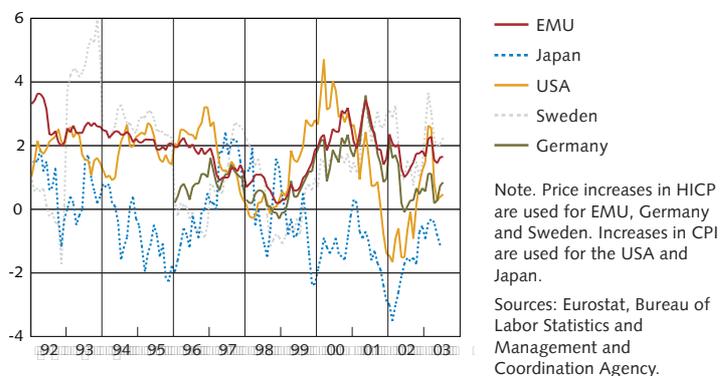
During a large part of the 1990s, the world economy experienced a general upturn in economic activity and relatively rapid GDP growth. However, over the past few years the trend appears to have turned. GDP growth has declined significantly in most countries and resource utilisation is now at a low level (see Figure 1). The trend in the Swedish economy has been slightly less negative, but there has been some slackening in economic activity. At the same time as the world economy has weakened, inflation rates in many countries have fallen appreciably. This applies in particular to goods prices, which have at times fallen in both the USA and Germany (see Figure B15). The question was then raised as to whether the USA and Germany, which are traditionally the driving forces behind global growth, were at risk of suffering the same fate as Japan, that is to say, tangibly weak growth and a prolonged fall in general price levels.<sup>12</sup>

There is good reason to always bear in mind the risk of deflation, as a fall in general price levels tends to be linked to significant problems in the real economy. However, it may be worth emphasising that falling prices are not always cause for concern, although this is often the impression given in the general debate.

### *Good and bad deflation*

The first natural distinction between good and bad concerns the length of the period of falling prices. While a more prolonged period of deflation can often have a negative impact on the functioning of the economy, this need not be the case if the fall in prices is short-lived. An example of the latter can be found in the Swedish economy at the end of 1998 and beginning of 1999. At that time, inflation measured as the 12-month change in CPI was negative for a few months, partly because an easing in monetary policy meant lower interest expenditure for households. The fact that prices were falling led to a number of eye-catching media headlines on the threat of deflation, but the real economic consequences of the actual price fall were probably very limited. Long-term inflation expectations were relatively firmly

**Figure B15. Consumer price developments for goods in different countries.**  
Percentage 12-month change



anchored around the inflation target.

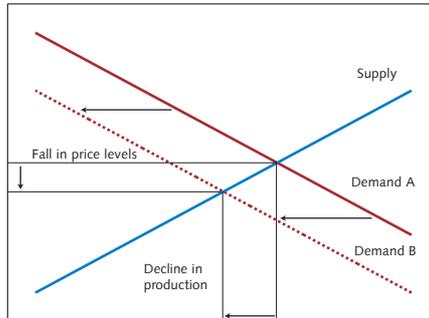
It is also important to distinguish between whether price trends are governed by developments on the demand side or on the supply side. A period of falling prices often originates from aggregate demand being significantly lower than the total supply of goods and services in the economy. This type of situation can arise for two reasons: One is that demand could fall heavily, for instance, as a result of households for some reason reducing their consumption. The other is that supply could increase significantly, for instance as a result of technological advances leading to increased productivity. Both reductions in demand and increases in supply can be linked to falling price levels. However, while demand-driven deflation is connected to a weak development in production, the opposite applies to supply-driven deflation (see Figures B16 and B17 for an outline of these effects). Because of the differences in the effects on production, these two types of deflation are sometimes referred to as "bad deflation" and "good deflation". Purely supply-driven deflation is probably fairly unusual, although developments in China over the past few years could provide an example of this. In the following discussion, deflation refers to a relatively prolonged period of falling prices and markedly weak demand. This is the definition on which international economic debate focuses.

<sup>12</sup> The situation in the United States is discussed in Bernanke, B.S., "Deflation: Making Sure 'It' Doesn't Happen Here", speech, Federal Reserve Board, 21 November 2002 and Bernanke, B.S., "An Unwelcome Fall in Inflation?" speech, Federal Reserve Board, 23 July 2003. For a discussion of the deflation threat in Germany (and the euro area), see for instance The Economist, "The Unfinished Recession", 26 September 2002, Issing, O., "The Euro after Four Years: Is There a Risk of Deflation?" speech, ECB, 2 December 2002 and Svensson, L.E.O., "The Risks of Deflation and the Effectiveness of Monetary Policy in the Euro Area", Briefing Paper (<http://www.princeton.edu/~svensson/>), 2003.

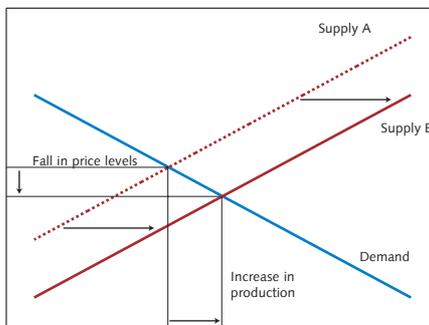
Note. The figure shows the effects on price levels (vertical axle) and production levels (horizontal axle) arising when demand falls from level A to level B.

Source: The Riksbank.

**Figure B16. Effects of a fall in aggregate demand. Price levels and production levels**



**Figure B17. Effects of an increase in aggregate supply. Price levels and production levels**



Note. The figure shows the effects on price levels (vertical axle) and production levels (horizontal axle) arising when supply increases from level A to level B.

Source: The Riksbank.

#### Why is deflation a problem?

Economic studies usually put forward three negative effects of deflation in particular. The first concerns the difficulty in reducing nominal wages. In a situation where demand and prices are falling, but nominal wages are not, firms are only able to compensate themselves for the loss of income by making staff cuts. The combination of sticky nominal wages and deflation thus reinforces the downturn caused by the initial decline in demand.

The second negative effect is due to the fact that deflation, if it is unexpected, results in a redistribution of wealth from borrowers to lenders. The reason for this is that deflation increases the real value of a given nominal debt in a way that was not anticipated when the loan contract was signed. If the loan was signed at a given nominal interest rate, the real interest payments will also be higher during the loan period. Similar effects could arise even if

inflation has an unexpected outcome that is not actually deflation. The basic problem is thus that prices do not develop as expected after the loan contract has been signed, not the deflation in itself.

The effects of deflation on the economy can be reinforced by borrowers' increased real debt burden affecting the credit granting process and financial stability. The increased real debts undermine firms' balance sheets and can make it more expensive and more difficult to borrow, which contributes to subduing economic activity.<sup>13</sup> Similarly, households whose wealth situation has deteriorated may experience problems in obtaining further credit. In addition, the increased real debt burden for borrower households and firms could lead to bankruptcies and to an increased percentage of bad loans in banks. If the worst comes to the worst, the long-term result could be problems with financial stability in the economy as a whole.

The third negative effect of deflation is related to the effects of monetary policy on activity in the economy. If a nominal interest rate of zero per cent is not sufficient to stimulate the economy and cure deflation, problems may arise. The real interest rate, that is, the nominal interest rate minus (expected) inflation, may need to be negative to stimulate a recovery. If the nominal interest rate is zero per cent, the real interest rate cannot be cut further but will remain positive.<sup>14</sup> The real interest rate that borrowers must pay will be equal to the deflation. The more prices fall, the higher the real yield needs to be for an investment to be profitable. The excessively high real interest rate in relation to demand will hamper investment and tend to reinforce the downturn.

#### What can be done to avoid deflation?

In the light of the problems outlined above, it is important to try to take preventive measures to avoid a deflation spiral. There is general agreement as to how the monetary policy framework should be designed to ensure that the risk of deflation is as small as possible. One central component is that monetary policy should be aimed at stabilising the inflation rate

<sup>13</sup> A fall in corporate sector investment as a result of a large increase in the real debt burden (known as debt deflation) is considered to have played a central role in the Great Depression of the 1930s. This hypothesis was launched by Irving Fisher ("The Debt-Deflation Theory of Great Depressions", *Econometrica* 1, 1933, pp 337-357).

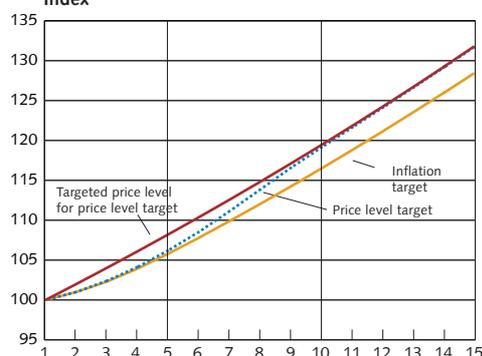
<sup>14</sup> The parallel to the case of rigid nominal wages is worth noting. While rigid nominal wages prevent a desired downward adjustment in labour costs, the zero limit for the interest rate prevents a desired adjustment of the intertemporal price of consumption today in relation to consumption tomorrow.

and inflation expectations at a positive, but low, level. This can be done by having an explicit inflation target that functions as a clear benchmark for participants in the economy. Monetary policy should be forward-looking to enable preventive measures to be taken if inflation threatens to fall below (or to exceed) the target level.

There is an interesting alternative - largely untested in practice - to defining the target in terms of a particular *inflation rate*. This is to set up a target path for future *price levels*, such as, that prices shall rise by 2 per cent a year (see Figure B18).<sup>15</sup> A price level target may be preferable to an inflation target when it comes to avoiding deflation. Perhaps the most important reason is that such a strategy, when perceived as credible, can be assumed a more efficient means of stabilising the long-term inflation expectations for the economy. A price level target means that today's inflation must be offset by higher inflation in the future (and vice versa). This means that the average inflation rate will be higher in this case than if there were no requirement to compensate for earlier low inflation, as is the case with an inflation rate target (see Figure B19).

In the slightly shorter term, a price level target can also contribute to more desirable downward adjustments in the real interest rate if deflation nevertheless occurs. The further price levels fall, the higher the future (actual and expected) inflation rate needs to be during a transition period in order to regain the target path. Further deflation will therefore "automatically" lower the real interest rate, even if the nominal rate has been cut to zero. Another advantage is that, in a deflation scenario, a price level target would not increase the real debt burden for borrowers in the same way as an inflation target risks doing. The reason is that the price level is brought back to the original path, which formed the basis for the lending contracts.

**Figure B18. Price level trends with a price level target and an inflation target respectively.**  
Index



Note. The figure shows the effects on price levels (vertical axle) arising over time (periods, horizontal axle) after inflation suddenly declines by 1 percentage point (from 2 to 1 per cent).

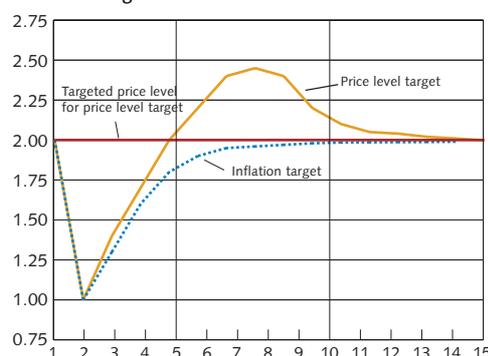
Source: The Riksbank.

*What can be done if deflation nevertheless occurs?*

Let us assume that a situation nevertheless occurs where demand is weak and prices fall, despite the central bank cutting its key rate as far as possible. What means are available to stimulate the economy? This question has been much discussed recently.<sup>16</sup> The debate has primarily concerned how the deflation trend in Japan could be broken, as well as how the Federal Reserve and other central banks should act in the event that they have exhausted all possibilities for stimulating the economy with interest rate cuts.

The discussion below focuses on monetary policy measures, but it may also be possible to use fiscal policy measures. If public finances are

**Figure B19. Inflation trends with a price level target and inflation target respectively.**  
Percentage increase



Note. The figure shows the effects on inflation (vertical axle) arising over time (periods, horizontal axle) after inflation suddenly declines by 1 percentage point (from 2 to 1 per cent).

Source: The Riksbank.

<sup>15</sup> See, for instance, Svensson, L.E.O., "Price Level Targeting vs. Inflation Targeting", *Journal of Money Credit and Banking* 31, 1999, pp. 277-295, for a more detailed discussion. Probably the only example of the implementation of a price level target is the policy conducted in Sweden during parts of the 1930s (see Berg, C. and L. Jonung, "Pioneering Price Level Targeting: The Swedish Experience 1931-1937", *Journal of Monetary Economics* 43, 1999, pp. 525-551).

<sup>16</sup> For a detailed description of the different methods and references to academic studies, see, for instance, Svensson, L.E.O., "Escaping from a Liquidity Trap and Deflation: The Foolproof Way and Others", under publication in the *Journal of Economic Perspectives*.

good to begin with, there may be scope for the central government to stimulate demand in the traditional way, by means of tax cuts and/or increases in expenditure. It is also possible to stimulate demand without an increase in the budget deficit, which could be an advantage in an economy where public finances have already been weakened. This can be done by, for example, lowering VAT and putting a tax credit on investment, which will make consumption and investment more attractive for a period of time. The central government can prevent an increase in the budget deficit by raising taxes that have less impact on demand in the economy.

With regard to monetary policy's ability to increase economic activity, the fundamental problem is that the central bank has cut its key rate to a level where it cannot be cut any further. However, there are other ways in which a central bank can try to stimulate the economy, although these are rather unconventional and largely untested. The basic idea behind most of these is that the central bank shall take measures that will lead to an increase in firms' and households' inflation expectations. As the real interest rate is defined as the nominal interest rate minus inflation expectations, it is possible to lower the real interest rate and thereby hopefully boost the economy.

However, there are also ways of influencing real interest rates via nominal interest rates. This can be achieved by aiming at other segments of the yield curve than the most short-term, if the longer-term rates are still positive. One way of trying to reduce interest on securities with a slightly longer maturity is for the central bank to declare that it intends to hold its key rate at zero per cent for a long period of time. According to the expectations hypothesis, which says that long-term interest rates are related to expected future short-term nominal rates, this should contribute to a cut in long-term interest rates. The central bank can also establish a low "interest rate ceiling" for bonds up to a certain maturity and commit itself to buying an unlimited number of bonds at this interest rate.<sup>17</sup>

A rather straightforward way of trying to

raise inflation expectations is to announce an inflation target or price level target. This has been recommended as a partial solution to the problems in Japan, where no quantified inflation target has been specified previously. However, if an inflation or price level target is to contribute to lowering the real interest rate and stimulating the economy, it must be perceived as credible by the participants in the economy. It may be difficult to gain their confidence, particularly in a situation where deflation already prevails and the key rate is around zero per cent.

One suggestion that has attracted considerable attention is based on the idea that the central bank can take action in the foreign exchange market to create the belief that inflation will actually rise. This idea can be described as follows.<sup>18</sup> The central bank announces and implements:

- 1 an upwardly inclined target path for price levels,
- 2 a depreciation and "crawling peg", i.e. a particular future path for the currency, and
- 3 an exit strategy, where the currency path is abandoned in favour of an inflation or price level target once the target path for price levels has been achieved.

To understand why steering the exchange rate can affect expectations of future price levels, it is useful to take an indirect route and ask the question: How would the exchange rate be affected *if* the promise of higher future price levels is perceived as credible by participants in the economy? Higher expectations of future domestic price levels entail a correspondingly weaker expectation of the future exchange rate. This is because the long-term interchange between domestic and foreign products is not affected. In Figure B12 the future price levels increase from PT to PT' and the exchange rate increases by an equivalent amount from VT to VT'. However, the weaker expected future exchange rate means that the exchange rate will weaken to an even lower level now (from VO to VO'). The reason for this is that if the domestic interest rate is zero per cent, while the foreign interest rate is positive, an

<sup>17</sup> These two methods have been advocated by, for instance, the US Federal Reserve, see the references to Bernanke in footnote 1.

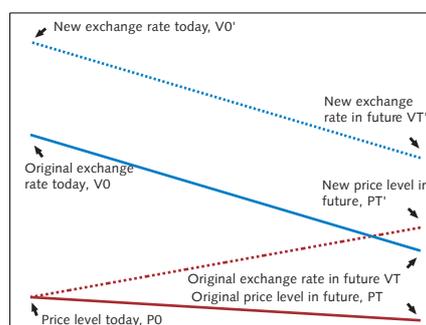
<sup>18</sup> See Svensson, L.E.O., "The Zero Bound in an Open Economy: A Foolproof Way of Escaping from a Liquidity Trap", *Monetary and Economic Studies* 19(S-1), Bank of Japan, 2001, pp. 277-312, and the reference to Svensson in footnote 5.

appreciation of the currency (around the size of the foreign interest rate) is necessary over time for the yield on an investment to be the same in domestic and foreign currency. The equilibrium condition in the international foreign exchange market would thereby be fulfilled. Figure B20 shows a parallel shift of the entire exchange rate path from line  $VOVT$  to line  $VO'VT'$ . In other words, if the promise of higher future domestic price levels is credible, this will be reflected in a significant depreciation of the domestic currency right now.

The "three-point programme" above reverses this reasoning and begins at the opposite end. The central bank can create expectations of higher domestic price levels and a weaker future exchange rate. It does this by announcing a depreciation of the currency and a crawling peg and by its actions shows that it is prepared to buy and sell unlimited amounts of foreign currency at the stated exchange rate. It should be noted that it is probably much easier to create credibility for this weaker exchange rate than for a currency exposed to depreciation pressure, as the krona was in the early 1990s. If the declared strategy does not hold, the domestic currency would appreciate back to the level prevailing before the central bank's announcement. An investor holding the domestic currency would then make a good deal. This means that there should initially, before the declared exchange rate path gains credibility, be a demand surplus for the domestic currency. This demand can easily be met by the central bank simply printing more money. The central element of this suggestion is that the central bank can create confidence in its promises through concrete action in the foreign exchange market. This is in contrast to a case where the central bank only announces an inflation or price level target.

To summarise, it can be observed that the best protection against deflation is probably to ensure that the economy develops in such a way that firms' and households' inflation expectations remain stable and at a reasonable

Figure B20. Price level and exchange rate trends.  
Price level and exchange rate



Note. The figure shows the effects on price levels and the exchange rate (vertical axle) occurring over time (horizontal axle) if the "three-point programme" is implemented.

Source: Svensson, L.E.O., "Escaping from a Liquidity Trap and Deflation: The Foolproof Way and Others", under publication in *Journal of Economic Perspectives*.

level. There are a number of indications that this level should be around 2 per cent.<sup>19</sup> Central banks that try to steer inflation towards a target of around 2 per cent can therefore be said to have an "additional insurance" with regard to avoiding the deflation trap. If deflation should nevertheless occur and the central bank has no means of cutting its key rate further, there are a number of measures to which it can resort. These include trying to influence interest rates on long-term securities, creating confidence in a higher future inflation rate or price level and taking fiscal policy measures. In this context it appears that small, open economies have a particular advantage. This is because the foreign exchange market offers an opportunity to create confidence in the promises that policy is aimed at raising future inflation and price levels.

How great a risk is there today that the USA, Germany or even Sweden will experience a situation similar to that in Japan? Most indications are that there is no major risk of deflation in any of these countries. All of them conduct monetary policy aimed, implicitly or explicitly, at maintaining price trends at a stable level around 2 per cent. In addition, economic activity has stabilised recently and even improved in some areas. It is also interesting to note that the Japanese economy has now begun to show signs of a more tangible recovery with significantly higher growth figures for GDP.

<sup>19</sup> Model simulations indicate that there is only a slight risk of the zero limit for the interest rate becoming binding when the average inflation rate is 2 per cent. Only in around 0-5 per cent of the cases does the economy approach the zero limit. See, for instance, Yates, T., "Monetary Policy and the Zero Bound to Nominal Interest Rates", *Bank of England Quarterly Bulletin*, 2003, pp. 27-37, for an outline of these simulations.