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# István Ábel, Kristóf Lehmann, Gergő Motyovszki, Zoltán Szalai: Deflation fears in developed economies\*

*Fears of deflation in the euro area intensified in early 2014. Low or negative inflation in several euro-area countries has increased the risk of deflation. The European Central Bank's communication suggests that the Bank considers deflation a genuine risk. In Japan, economic policy has been struggling with deflation for over a decade now and has recently introduced a number of quantitative and qualitative easing measures. While Hungary is not directly threatened by deflation risks, persistent deflation in the euro area and the associated stagnation would have an adverse effect on this country as well. In this article, we explain that a decrease in price levels does not in itself constitute deflation. By contrast, if the decrease in prices is extensive and sustained and if it is incorporated into expectations, and if a liquidity trap constrains the scope of monetary policy and there is a genuine risk of a debt spiral, then there is a danger of deflation.*

## PRICE DECREASE AND DEFLATION

A mere decrease in prices (negative inflation) does not in itself constitute deflation. Several factors must apply simultaneously in order for deflation to occur. If there is a lasting decline in prices and a weak demand environment (with a negative output gap) and if this is built into the expectations of future changes in prices, then the economy will experience deflation. Deflation intensifies if the central bank is in a liquidity trap<sup>1</sup> and unable to sustain a sufficiently low real interest rate. A decline in prices due to temporary, one-off shocks (e.g. reductions in indirect taxes, base effects) does not constitute deflation. Nor does a price decrease represent deflation if it has become entrenched due to technological progress, an increase in productivity or the intensification of international competition. Such price decreases tend to only affect specific sectors and generally do not result in a decline in prices across the economy as a whole. Deflation tends to be coupled with a reduction in activity, whereas technological progress, productivity increases and price decreases resulting from intensified competition have a favourable impact on economic growth.

Rising productivity and international competition have the natural outcome of driving down prices. This may occur as a sudden shock: we call this a positive supply shock, which may result, for instance, from a sudden and lasting decrease in raw material and energy prices or a leap in technical progress. In today's global economy, the improvement in certain services is referred to as just such a factor, driving prices down in telecommunications and financial services for instance. The downward trend in certain prices observed today in the United States is mostly attributable to such factors. Price decreases of this type do not represent a deflationary risk. Although they may trigger decreases in the prices of other products, they will not generate an unstoppable spiral of declining production and increasing unemployment, since they represent a change only in the relative prices within the economy rather than a fall in the overall price level. And if some products become cheaper, consumers will use the income they are thus able to save to buy other products or to buy more of the cheaper ones. They may also put this income into savings, which other participants may then borrow and spend. A decrease in aggregate demand may also be shock-

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\* The views expressed in this article are those of the author(s) and do not necessarily reflect the official view of the Magyar Nemzeti Bank.

<sup>1</sup> Keynes discussed the liquidity trap in detail, but admitted that he had not witnessed such a situation in practice. Burdekin–Siklós (2004) cite Keynes' findings in detail. An 'absolute' and a 'relative' interpretation of the term has developed in the literature on the subject. An example of the former is found in Krugman (1998): this influential study discusses the reasons for the deflation in Japan and the possible way out by means of economic policy. In this understanding, a liquidity trap develops once the central bank reaches the zero lower bound with its nominal interest rates and becomes unable to provide economic stimulus any further. It was Jan A. Kregel who, in dispute with Krugman, expounded the relative interpretation. According to Kregel, a liquidity trap may develop even before the zero lower bound is reached if the markets become one-sided as all the players only consider probable a rise rather than any further decrease in interest rates. Rather than hold bonds, the participants seek to avoid the risk of capital loss due to rising interest rates by choosing to hold non-interest bearing instruments (cash, liquid cash on account, etc.). Both arguments, however, share the observation that the interest rate as a monetary policy tool becomes ineffective once interest rates have fallen very low. For a more detailed discussion see Csontos et al. (2014).

like (one-off negative demand shock), for instance as a result of a sudden fall in the value of consumers' wealth (e.g. if share prices tumble). It should be clear, however, that this in itself does not represent deflation either. Although significant declines on the stock markets may be an indicator of increased deflationary risks, a threat of deflation will apply only if the negative demand shock causes the price decrease to last, which is then built into expectations, and monetary policy has limited scope for offsetting these trends. Accompanying such a situation is the liquidity trap, a phenomenon in which even an almost unlimited supply of liquidity is unable to halt the contraction in prices and production.

## ADVERSE EFFECTS OF DEFLATION

Deflation can curb economic activity through three channels. In one channel, the increase of the real interest rate triggers a vicious cycle of recession and permanent price level decreases resulting from the disappearance or postponement of private sector demand, consumption and capital investment.<sup>2</sup> Limited labour flexibility arising from labour market rigidities and from the forces acting against the nominal decrease of wages represents the second channel. The reduction of real wages in the event of a fall in price levels would necessitate an especially high degree of nominal wage reductions. Although workers would be happy to accept work for lower wages when money is tight, this kind of flexibility is hampered by labour market rigidities and the rules and contracts binding employers, which may lead to increasing unemployment and falling production.<sup>3</sup> Recovery from recession may be rather lengthy without more flexible adaptation on the labour market. The third channel increasing the costs of deflation is represented by the debt spiral and the losses incurred in the debt deflation it engenders. In order to reduce their debts, which are unsustainable in part due to the rise in the real costs of debt service, economic agents will be frequently forced to sell their assets at depressed prices. Forced liquidation and a devaluation of financial assets and real estate is inevitable when everyone is forced to dispose of these assets to reduce their indebtedness.

### Real interest rate channel

Most of the costs of deflation do not depend on the negative value of inflation in the strict sense; instead, adverse impacts appear even while inflation is still positive, but remains below

expectations (which may eventually lead to genuine deflation). The emphasis is on the deviation from the expectations, which may trigger pressure to adjust. One effect of inflation below the expected level (or deflation) will be a rise in real interest rates, which in turn influences the decisions of corporations as well as households. If the real interest rate is higher, delayed consumption may reduce demand and increase unemployment. Higher real interest rates also increase the cost of capital for investment projects, and thus the fall in the net present value of expected yields may cause a contraction in investment activity. A decrease in demand pushes prices downwards, which may increase the real interest rate further, potentially triggering a negative spiral. In this mechanism, the *stock* of participants' debts is disregarded and we speak about the connections between the categories of production, capital investment and consumption (*flow*) within the framework of the traditional business cycles.

It should be noted that, beyond the nominal rate of interest, the real rate of interest also depends on the inflation expectations of economic agents. Whereas negative expectations may destabilise the economy through self-reinforcing processes, properly anchored positive inflation expectations may prevent such a spiral. There are a number of other stabilisation mechanisms that may prevent a deflationary spiral from developing. Overall, the practical relevance of deflation developing via these channels of the business cycle is low, as long as expectations are properly anchored by the fiscal and monetary policy. In these circumstances, applying the conventional instruments of stabilisation will achieve recovery from recession sooner or later.

A problem may arise when the fiscal and monetary policies also have limited scope for action. For instance, as a liquidity trap approaches a central bank may be unable to provide sufficient stimulus to neutralise deflation, since it is unable to reduce the nominal interest rate sufficiently to offset the rise in the real interest rate. In such a situation, even an almost unlimited supply of liquidity would be unable to reverse the fall in prices and production. In such instances, the forward guidance of monetary policy may help shift inflation expectations towards the longer-term inflation target. The inflation target can fulfil its role as anchor if monetary policy is credible; this is a precondition for the success of forward guidance. It works if the central bank is able to commit to continuing to keep the base rate low once the macroeconomic

<sup>2</sup> Reviewing deflationary episodes throughout history until the end of the 19th century, Burdekin–Siklos (2004) describe in detail these episodes, most of which reflected the mechanism of the real interest rate channel. The deflationary debt spiral, which the authors call Fisher's debt deflation, is referred to merely as a serious threat in this overview, even though it was at the very heart of the crisis of 1929–33. The authors emphasise the international nature of the Great Depression which differs from other episodes in that it occurred simultaneously in the United States and numerous other countries of the world.

<sup>3</sup> Keynes was sceptical about wage cuts as an adjustment mechanism in situations when aggregate demand is otherwise insufficient. In his characterisation, wages are an important component of aggregate demand, and further reducing them may reinforce a negative spiral.

situation no longer demands this. It is important the central bank is also able to prevent long-term yields from rising too soon to prevent the risks of increased capital loss triggered by rising inflation expectations. The central bank may choose to achieve this by purchasing longer-term securities.<sup>4</sup> A promise of a path of low real interest rates combined with well anchored inflation expectations will have a stimulating effect on the economy.

## Labour market rigidities

Another channel through which deflation costs emerge is the limited ability of real wages to adjust. In the event of moderate positive inflation, a minor decrease in wages may be achieved when nominal wages do not rise with the rate of inflation. If the economy experiences productivity growth,

then a slow adjustment of real wages may be achieved even if the rate of real wage growth remains below the rate of productivity improvement (see box below). However, if the rate of inflation is low or negative, cutting nominal wages is the only way left to reduce real wages. A number of studies have looked into the downward rigidity of wages, i.e. the fact that employees tend to refuse quantifiable nominal decreases to their wages (see Akerlof et al., 1996; Altonji–Devereux, 2000; Benigno–Ricci, 2011; Daly–Hobijn, 2014 and Kahn, 1997). As a result, companies are less able to cut the labour cost component of their production by reducing real wages after a negative shock, and tend to do the same by laying off the labour force, which leads to higher unemployment and deeper recession. In the event of deflation, real wages are not only less able to adjust: in fact, they will rise, which may increase unemployment independently of the initial shock.

### Box 1

#### On the adjustment of unit labour costs (ULC)

The ratio of unit labour costs (ULC) to those of foreign competitors (the ULC-based real exchange rate) is a key factor in determining price and wage competitiveness. It has the following three determinants: the nominal exchange rate, nominal wages and the productivity of labour. A depreciation of the real exchange rate will improve competitiveness and can be achieved via a weaker nominal exchange rate, lower nominal wages or higher productivity. The most favourable of the above scenarios is achieving improvement via faster growth in productivity, since this will not lead to an economic downturn or unemployment. In contrast, the other means for achieving real depreciation may cause problems.

Due to rigidities, a major decrease in nominal wages can only normally be achieved in an environment of high unemployment, which would, via the drop in demand, lead to recession and intensified deflation, and may also trigger a debt spiral, if there are significant debts outstanding. All of this may override the ability of a weaker real exchange rate to improve competitiveness. This kind of adjustment may be facilitated by high wage inflation in the foreign trade partner countries, since it allows improving relative wages easily, without effectively reducing domestic nominal wages.

The depreciation of the nominal exchange rate will have a mostly inflationary impact, directly via import prices and indirectly via the foreign demand that may be expected to increase in response to the improved competitiveness; however, the direct and indirect import content of exports and the extent of the economy's debts denominated in foreign currency must be taken into account in this regard. A depreciation of the exchange rate increases the value of foreign debt in domestic currency, which means a higher real debt burden. The resulting forced deleveraging may counteract the favourable impact of the weaker exchange rate on export competitiveness and may, in an extreme case, trigger a deflationary spiral and in turn a worsening recession.

<sup>4</sup> For more detail, see Csontos et al. (2014) and Aglietta (2013), pp. 19–24. The Federal Reserve, the Bank of England and the Bank of Japan have all combined forward guidance with securities purchases in order to keep longer-term yields low. Central banks tend to focus on the short-term interest rate segment and will intervene in longer maturities of the yield curve only when necessary. There is much greater uncertainty in this segment as to whether the intended objective can be achieved.

## Deflationary debt spiral

The third channel represents an even greater problem. Measures taken to curb debts that have grown unsustainably high cause a decline in consumption and capital investment. An inflation path below what was expected at the time of borrowing increases the real debt burden. If all debtors were able to avoid default, then income would be reallocated to creditors in a period of deflation. And since creditors tend to be characterised by a higher rate of savings, this type of income reallocation reduces consumption demand. Tax revenues fall as a combined effect of a loss of demand and price decreases, while the costs of financing the government debt fail to decline, and thus the deficit may increase. Even this may not necessarily be a problem, since the increase in household and corporate savings due to the delay in consumption and the decrease in capital investment may finance the deficit, and therefore a deterioration of the balance of payments is not inevitable. Bigger problems may arise due to private sector debts. The increase of the debt burden of households and corporations in an economy in a deflationary spiral will be similar to the impact of the depreciation of the exchange rate on foreign currency debt. Debt is fixed nominally and is generally subject to high rates of interest, even as the value of the assets underlying the loans (real estate or other collateral) falls with deflation. In order to avoid having to reduce their outstanding lines of credit, corporations must offer additional collateral to supplement their existing collateral which has devalued in the meantime. This forces the private sector to cut its debts and deleverage. The consequences of the pursuit of debt deflation are self-reinforcing. The money spent on this will not boost demand; instead, it tends to reduce capital investment directly as well as indirectly.

The fall in demand due to delayed consumption (if it is not yet a permanent fall caused by debt deflation) tends to trigger a temporary under-utilisation of capacities, rather than a contraction in capacities. By contrast, debt deflation tends to constrict capacities. Moreover, it may occur even without prices actually falling: it is sufficient if the rate of price increase remains steadily below the rate expected at the time of borrowing. In such a case, debt service (real interest rate) will be much higher than originally calculated. This shock forces a reconsideration of the calculations, leading to a sort of deleveraging that may trigger deflation via spillover and self-reinforcing channels.

Even though the interaction between production, capital investment and consumption (*flows*) triggers stabilisation mechanisms, the correlations concerning debt (*stock*)

change the situation fundamentally. Banks play a pivotal role in this process. As soon as they realise that their clients are in trouble, they cut back their lending. Since banks lend not only to corporations but to other banks as well, the spillover effect of this tightening of credit will force other banks to cut back their lending as well. This in turn puts even more clients in a difficult situation and the adverse trend continues. In a normal business cycle, the banking system is able to halt the debt spiral and thus stabilise the economy. When the central bank notices tensions in economic activity and lending, it lowers the interest rate and injects liquidity into the banking system. As a result, the banking system is not forced to cut back its lending and is able to assist in the recovery. The private sector reduces savings, and consumer and capital investment demand increases. In a debt spiral, by contrast, the private sector will continue to try to cut its debts and increase its savings, even as liquidity is provided to the banking sector and interest rates are kept low. Higher savings will, in turn, result in lower consumption and a decline in capital investment, which deepens the recession and leads to a vicious circle of failure. Household incomes fall, and savings sufficient to reduce indebtedness to the desired level are not reached; on the contrary, the burden of the now reduced debt is even higher in comparison to incomes, prompting households to try to save even more. Deleveraging in the corporate sector is a similarly self-fulfilling failure that exerts pressure to continue debt deflation.

The central bank can help by cutting interest rates and providing liquidity, but the outcomes will be limited. Interest cannot fall below a certain level, since liquidity would wind up in cash beyond this level (absolute or relative liquidity trap) and would not generate demand. Once it has started, a deflationary debt spiral is difficult to stop. Left on its own and without intervention, the recession may become entrenched (stagnation). A debt spiral represents a greater threat than the deflationary episodes discussed above: without debt, the pressure to save would soon ease and the system would stabilise. In a debt spiral, however, the real appreciation of the debt continues to propel this pressure and thus feeds into a self-reinforcing deflationary mechanism.

## WHAT CAN A CENTRAL BANK DO IF A LIQUIDITY TRAP IS REACHED?

As long as there is no liquidity trap constraining its room for manoeuvre, monetary policy can rely on its conventional instruments to achieve a decline in the real rate of interest, which boosts activity and may thus offset the deflationary pressure.<sup>5</sup> However, the situation changes at around an

<sup>5</sup> Bernanke (2002) and Svensson (2003) discuss the wide range of instruments available to central banks to combat deflation. A study by Borio-Filardo (2003) is a good example of an evaluation of the deflationary threat from the perspective of monetary policy.

interest rate level that is close to zero. At this level, the real rate of interest may be higher than is necessary for stabilising the economy, but the central bank is unable to reduce it further by cutting the base rate, as a result of which a permanently weak economic environment may cause deflation.

In such a case, the central bank may try to credibly anchor inflation expectations to a positive inflation target in order to achieve its objective, since this may limit the increase in the forward-looking real interest rate even in a liquidity trap and may prevent deflation from becoming embedded in expectations and thus triggering self-reinforcing processes. Even in this scenario, the resulting real interest rate may be higher than necessary for stabilising the economy. In addition to cutting short-term interest rates to zero, the reduction of long-term yields may also help. This may necessitate non-conventional monetary policy instruments, and quantitative and qualitative easing as well. Quantitative easing involves asset purchases, by way of which the central bank actively intervenes in the market of certain financial instruments and thus reduces the yields there, and potentially even the longer-term yields. The Fed, the Bank of England, the Bank of Japan and, to a certain extent, even the European Central Bank have taken such steps since the start of this crisis. The effectiveness of these measures depends on the state of the financial system as well. The other method, the one most frequently used today, is that of forward guidance, i.e. actively influencing expectations of the future changes in monetary policy in order to influence the present-day macroeconomic outcomes. Promises of accommodative monetary conditions and a low interest rate environment sustained over the long term in order to drive long-term nominal interest rates down as well, may create in the present a lower expected interest rate path looking forward and thereby stimulate the real economy.<sup>6</sup>

Nevertheless, once deflation has occurred and has been incorporated in the expectations, such measures are likely to have only a limited impact. Accordingly, if the risk of deflation is sufficiently high, proactivity and preventive action may be preferable to fighting it.

## The Taylor rule and the Fisher equation

Benhabib et al. (2001) describe one of the most widely known models for the possibility of a deflation trap. Their analysis has attracted considerable response, and although the assumptions of the DSGE model analysed are rather restrictive, the simple framework used for illustration has proven useful in subsequent analyses as well (Antolin-Diaz, 2014; Bullard, 2010). In the following, we adopt Antolin-Diaz's

(2014) depiction to illustrate deflation risk using Japanese, European and American data.

Chart 1 is a schematic representation of two relationships. One is the relationship describing the interest rate decision of the monetary policy-makers as an increasing function of the inflation rate:  $r_{nominal} = f(\pi)$ . This is the so-called Taylor rule representation, indicating that the central bank responds to rising inflation by raising the interest rate progressively, with an inclination for more aggressive interest rate increases the higher the inflation. Inflation reflects the difference between demand and supply conditions. The market response to excess demand is a price increase, whereas the response to excess supply is a price decrease. The negative output gap also captures the imbalance of supply and demand (in addition to the inflation rate) and also represents a component of the Taylor rule (although we did not make this explicit in the diagram). If the output gap is negative and if the economy is characterised by insufficient demand in a recession, then the central bank will cut the interest rate to boost demand. However, interest rate cuts have an absolute lower bound at zero per cent, as is demonstrated by the flattening of the Taylor rule curve as it nears the horizontal axis.<sup>7</sup>

Another relationship pictured in Chart 1 with a dotted line, is the Fisher equation (Fisher, 1933). According to this, economic agents make their decisions by taking the real interest rate ( $r_{real}$ ) into account. The nominal interest rate ( $r_{nominal}$ ) is calculated as the real interest rate plus inflation expectations ( $\pi^e$ ):

$$r_{nominal} = r_{real} + \pi^e$$

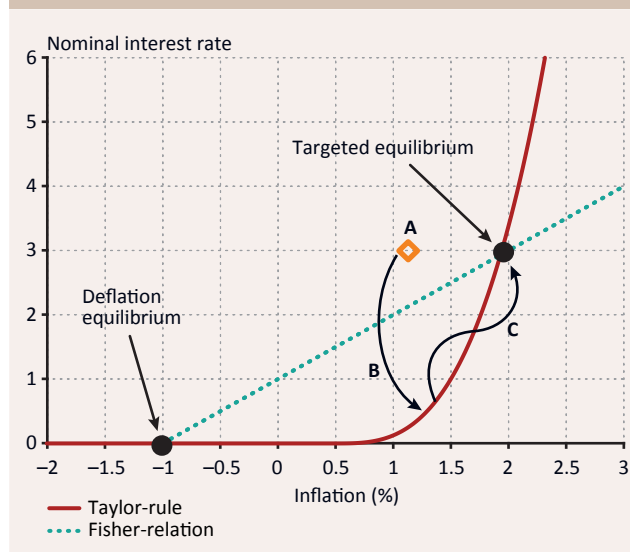
The Fisher equation plotted in the diagram shows the special case when expected inflation equals the actual rate of inflation and the real interest rate stands at 1 per cent. If this value is equal to the *equilibrium real interest rate* (a constant 1 per cent), then inflation at this level will be unchanged, whereas there is inflationary pressure below it and disinflationary/deflationary pressure above it. The equilibrium real interest rate is given by the intersection of the Taylor curve and the Fisher dotted line. At this point, the economy is balanced in the sense that the nominal interest rate implied by the monetary policy decision rule and the inflation in the economy coincides with the equilibrium real interest rate. Of the two intersections, the desirable and targeted equilibrium is found at the point where the inflation rate equals the central bank's inflation target (the Taylor rule is defined with this in mind). If the economy is at Point A in Chart 1, that is not an equilibrium. The rate of inflation is lower and the real interest rate is higher

<sup>6</sup> Given the modern bond market, such stimulus may be thwarted if economic agents overreact to the increasing inflation expectations and start to sell to avoid bond losses. The sell-off would drive real yields up. See Csontos et al. (2014).

<sup>7</sup> See Footnote 1 on the absolute and the relative lower bound, and the liquidity trap.

than it would be in equilibrium. Economic agents may respond to this by, for instance, finding it worthwhile to increase their savings, which reduces consumption, which in turn reduces prices via a decline in demand. This phenomenon may justify a monetary policy decision to cut interest rates in light of the decreasing inflation and a potential negative output gap occurring. This is the segment of the curve denoted by B in the diagram. The interest rate cut will trigger capital investment after some time, which may result in a higher employment rate and increased demand, which in turn may lead to inflationary pressure and, ultimately, interest rate rises (Phase C).

**Chart 1**  
**The Taylor rule and the Fisher equation**



We have used an approximate, theoretical argument based on assumptions to describe the adjustment process above. Further analysis involving the accurate matching of quantitative attributes would be necessary to give us a more realistic understanding of the adjustment. One may suspect that, as the case may be, the path may lean towards the deflation trap shown in Chart 1 instead of adjustment towards the desired equilibrium. In such a situation, the real interest rate is exactly at its equilibrium level, but the central bank could not achieve its inflation target and monetary policy has limited options for easing by reducing further the real interest rate. To the left of this point, with the real interest rate higher than the equilibrium, the deflationary pressure becomes self-reinforcing.

A more detailed analysis would allow us to present the relative version of the liquidity trap instead of its better-known, absolute version; in the relative version the graph of the Taylor rule remains above zero throughout and intersects the axis representing the nominal interest rates at a positive

value. The above description is arbitrary and simplified also because it uses a single interest rate to characterise monetary conditions, whereas in reality it is the whole yield curve that plays a role in monetary transmission. The behaviour of long-term yields on the largely liquid bond markets is greatly influenced by growth and inflation expectations, while at the same time they are sensitive to changes in short-term interest rates. At these maturities, the higher nominal interest rates cannot compensate for the higher expected inflation given the risk of capital loss on bonds, which means that the behaviour of long-term interest rates is not predictable and the simple Fisher equation is unable to describe even its direction well.<sup>8</sup>

We note that the Taylor rule represents the possible responses of monetary policy and does not incorporate fiscal policy explicitly. According to Richard Koo, who introduced the notion of 'balance-sheet recession', fiscal policy expansion is the only means for stimulating the economy in an environment of deleveraging.<sup>9</sup>

## A COMPARISON OF INFLATION FEATURES IN JAPAN AND THE EURO AREA

The strategic framework of the Japanese central bank continues to focus primarily on achieving price stability. At its monetary policy meeting in January 2013, the Bank of Japan adopted an inflation target of 2 per cent with a stronger commitment than the temporary target a year before. Since the country has faced protracted deflationary difficulties for a long time, the central bank is using all instruments available to commit itself to breaking the deflationary spiral.

Over the past 15 years, the average annual rate of inflation has been -0.3 per cent in Japan. Unlike in the Great Depression of 1929–33, when prices fell sharply in a short period of time, Japan now has experienced a fall in consumer prices by a small degree, but lasting for a very long time. Deterioration was also moderate in terms of unemployment, the rate of which reached only 5.5 per cent even in the worst periods, in contrast to the mass unemployment during the Great Depression. One may compare the present-day deflation in Japan to a chronic lifestyle issue. Once the expectations had incorporated all of this, breaking the spiral became very difficult. What made managing the situation even harder in Japan was the fact that the key interest rate had been reduced to 0.5 per cent back in 1995, allowing little room for further rate cuts. The decline in prices damaged capital investments and dampened economic growth. From a macroeconomic perspective, however, debt deflation and the dramatic fall in

<sup>8</sup> See Kregel (2000); described in Csontos et al. (2014).

<sup>9</sup> Koo calculates that the government 'prevented' JPY 2,000 trillion in losses by deficit spending of JPY 460 trillion in the period 1999–2005.

property prices caused much greater losses than the deflation of consumer prices.<sup>10</sup> Over the past decade and a half, the Japanese economy has faced serious growth challenges due to the prolonged deleveraging process.<sup>11</sup> Property market assets experienced a significant fall in prices in the first half of the 1990s (urban property prices fell by half over the course of 5 years), which resulted in debt deflation (deleveraging) in the private sector due to the significant contraction in the growth outlook. Economic policy shifted towards flexible wage adjustment to mitigate the decline in employment. The decline in wages, the strong competition among businesses and the increase in imports prompted corporations to change their pricing strategies, leading to deflation (a decrease in the general price level).

This permanent deflation correlated with the weak economic growth expectations. In the period of debt deflation, which started in the 1990s, even continued monetary easing failed to boost the economy. The Japanese central bank announced that its zero base rate policy, employed from 1999 onwards, would last as long as deflationary expectations existed. Monetary easing proved ineffective however. On the contrary, the global recession fears prevailing in 2001 further reinforced the expectations of low economic growth and a decline in the price level in Japan. The appreciation of the Japanese yen against the US dollar further aggravated this trend. All of this worsened export competitiveness and made imported goods cheaper, which also drove down inflation. Since its traditional monetary policy instruments had reached their limits, the Bank of Japan started to employ quantitative easing in the period of 2001 through 2006 in order to restart economic growth and lending via further easing of monetary conditions. It failed to stimulate the economy substantially in this six-year period, and deflationary expectations became entrenched. Even the combined effect of forward guidance and securities purchases was barely able to reduce long-term yields and was certainly unable to boost aggregate demand.<sup>12</sup> Deleveraging by economic agents and banks' risk avoidance outweighed the effects of the central bank's policy.<sup>13</sup> Given the immense additional growth challenges during the global financial crisis, even further monetary easing was unable to prevent the continued decline in the price level.

As the base rate was still at zero, in April 2013 the Bank of Japan decided to implement a programme of 'quantitative and qualitative easing' (QQE). QQE seek to increase the proportion of longer-term Japanese government bonds within the balance sheet of the central bank in a two-pillar approach. First, they have expanded the asset purchase programme budget in annual phases of JPY 50 trillion and, second, they have sought to increase the maturities of the assets in the balance sheet by buying longer-term assets. As a result, the average maturity of 3 years may grow to 7 years. It was decided unanimously that the monetary base would serve as the main target instrument instead of the unsecured overnight lending rate. They plan an expansion of the monetary base by JPY 60–70 trillion every year and to maintain the scheme until reaching a stabilisation of inflation expectations at around the target. Simultaneously with its expansion of quantitative and qualitative easing, the Bank signalled in its forward guidance that it would maintain this policy of aggressive easing until inflation rose permanently to near the 2 per cent target.

The experience of Japan raises the question of how this could have been avoided. In their analysis, Ahearne et al. (2002) state that deflation had been entirely unexpected in Japan. Strong competition forced corporate rationalisation, which increased unemployment and even though consumption grew, deflation became entrenched.

## THE EURO AREA DRIFTS TOWARDS DEFLATION

Inflation has been below the target for several months in the euro area. However, this low inflation is attributable primarily to the negative price changes in some countries along with the low energy and raw material prices, rather than a fall in demand across the entire euro area. Furthermore, inflationary expectations are anchored at around the target level and there are no signs of delaying purchases at the level of the area as a whole; according to the forecast of the European Central Bank, aggregate demand will continue to rise across the forecast horizon. As a result, the European Central Bank does not consider area-wide deflation as an immediate threat.<sup>14</sup>

<sup>10</sup> Naohiko et al. (2005) and Koo (2012). In 1990s property prices plummeted by 87 per cent. The loss in securities and property wealth amounted to three times the GDP for the year 1989, whereas it was equal to annual GDP in 1923–33 in the United States (Koo, 2012).

<sup>11</sup> According to former central bank governor Shirakawa, Japan lost two decades, of which only the first was attributable to the balance-sheet recession. Balance sheets were cleaned up in the first decade and the subsequent slow rate of growth can be explained by an aging society: the growth rate of per capita GDP is comparable to the relevant figures in other advanced economies. He does not believe that a boost to aggregate demand would resolve this problem caused by demographic factors (Shirakawa, 2012).

<sup>12</sup> Ugai (2007), Aglietta (2013).

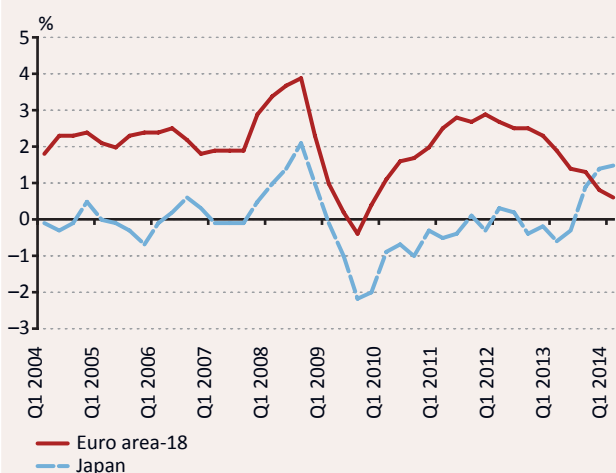
<sup>13</sup> "The importance of anchoring inflation expectations has been widely recognised and many central banks consider well-anchored inflation expectations as one measure to gauge the effectiveness of monetary policy. However, as yet there are no established theories on how inflation expectations should be brought back to the target once they have drifted downward. In particular, we do not have established theories that explain how inflation expectations can be raised at the zero lower bound and that suggest feasible policy measures to achieve this." Kuroda (2014, p. 5.)

<sup>14</sup> There are numerous dissenting opinions on this matter, as many analysts believe that the ECB's dilatory behaviour is highly risky (Mody, 2014).

## A presentation of inflation trends

Even if we leave the macroeconomic relations aside and focus solely on price developments, we see signs suggesting deflation in the euro area. A comparison of inflation trends in the euro area with Japan, which has been grappling with deflation since the 1990s, reveals a worrying picture (Chart 3).

**Chart 2**  
Consumer price index trends in Japan and the euro area



Source: OECD.

Negative price trends are affecting certain countries in the euro area, primarily those that faced serious crises and needed external rescue schemes (Cyprus, Greece and Latvia). This in itself does not imply a threat of deflation across the area as a whole, since the relative price adjustment in these countries compared to the euro area as a whole does not exclude the possibility that such a negative adjustment would be merely transitional. The adjustment after the euro accession of the pre-accession prices, which had been above the area average and therefore detrimental to competitiveness, presupposes a decline in prices within a monetary union since devaluation is not an option to help the adjustment. Negative price trends in certain countries within a monetary union will not cause deflation as long as most of the countries experience inflation. In an integrated market, the arbitrage mechanism ensures that price gaps remain within certain limits and, at a longer time horizon, capital inflows and other factors of production may also have a similar effect.

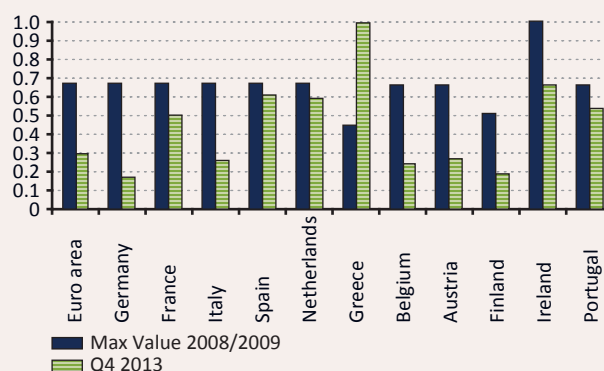
Real interest rates have increased steeply in more indebted countries even as the rate of inflation fell below one per

cent, which suggests an emerging threat of a deflationary debt spiral. If the rate of inflation is near zero, resistance to cutting real wages (nominal wage rigidity) may intensify the problems in labour market adjustment. At the moment, this is an especially pronounced issue in the euro-area periphery countries, where real wages should be reduced to regain competitiveness. There are adverse developments in the price gaps within the euro area, and there are forces at play that drive divergence. Since the policy rate is the same in every member state, the real interest rate will be lower in countries with higher inflation, which is a factor for boosting growth. The struggling countries of the periphery are experiencing deflationary trends today, which in turn means higher real interest rates leading towards deeper recession.<sup>15</sup>

Taking into account the differences between the countries of the euro area, Husabø (2014) calculated a deflation risk indicator that measures how broadly negative values occurred in the three-month price changes.<sup>16</sup> It evaluates deflation risk by measuring negative changes not only in terms of the European Central Bank's inflation index (HICP), but also taking into account the negative changes in producer prices (PPI), the GDP deflator and wages; it also assesses whether there has been a negative change in the majority of the HICP components. Beyond the product dimension, the index also has a time dimension. It considers a negative price trend lasting for more than six months of the year as deflation. The third determinant in the index measures the changes in expectations. The deflation indicator may take a value between 0 and 1, where 1 is the value denoting deflation. The index values calculated per country are presented in Chart 3.

**Chart 3**  
Deflation risk index in the euro area

(2008/2009 and 2013)



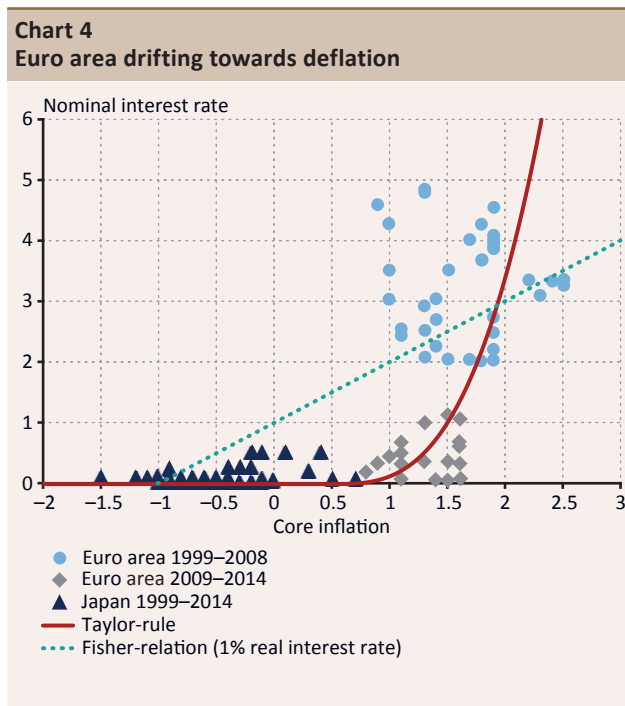
Source: Husabø (2014).

<sup>15</sup> Walters (1986) highlighted the risk of deepening divergence.

<sup>16</sup> Of the IMF occasional papers looking at the issues of the multi-determinant measurement of deflation, Decressin-Laxton (2009) and Kumar et al. (2003) provide detailed overviews.



Chart 3 shows that the threat of deflation had fallen by the end of 2013 from the previous critical maximum levels of 2008–2009 in all of the member countries except Greece. In this comparison, the deflation risk appears to be waning across the euro area as a whole. However, monetary policy has also changed in the meantime and we are nearer the zero interest level, which is critical in terms of deflation. Plotting the inflation and interest rate figures of Japan and the euro area in the framework discussed by Benhabib et al. (2001) and employed by Bullard (2010) and Antolin-Diaz (2014) results in the image shown in Chart 4, which suggests that the euro area has drifted towards deflation.



Even the European Central Bank does not completely exclude the possibility of deflation risk in a scenario where the area-level price index remains permanently low, e.g. below one per cent. This may impact consumers' expectations as well. Furthermore, low inflation across the entire area makes relative price adjustment harder to achieve in the countries that have lost their competitiveness as they will need greater reductions in wages and costs to regain their relative competitiveness; minor but protracted negative price development may be required.

Although this is not mentioned by the European Central Bank, the debt spiral version of deflation, which is discussed by analysts, is already having an impact.<sup>17</sup> The real burdens of debtors (households, corporations and public sectors) are higher than the debt service calculated at the time

of borrowing. This applies especially in the crisis-stricken countries experiencing declining prices. Deleveraging is made all the more difficult by low inflation or price decreases in these countries. In the IMF's assessment (Moghadam et al., 2014), the situation in the euro area is best described by the verbal innovation "lowflation" rather than the word deflation.

## SUMMARY

Deflation occurs when a decline in prices takes place in an environment of permanent demand deficit (negative output gap), a stagnating economy and interest rates close to zero, with inflation expectations also remaining permanently low. A decline in prices triggered by transitional factors is not considered to be deflation. A permanent decline in prices caused by increasing productivity or price competition is not deflation either, as it is normally coupled with an intensification of economic growth. Accordingly, Japan's lost decade was spent fighting deflation; and the current developments do not promise recovery any time soon, in spite of some very aggressive quantitative and qualitative easing. While deflation risks are low in the euro area as a whole, it is not clear at the moment whether the economies on the periphery can recover after their forced deleveraging or will instead slide into deflation characterised by a debt spiral.

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<sup>17</sup> De Grauwe (2014).

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