

Magdalena Kiedrowska, Paweł Marszałek**

DEFLATION: THE MATTER UNDER DISCUSSION

We survey the ongoing discussion concerning deflation, outlining both the theoretical and practical aspects of this issue. We formulate six preconditions, crucial in preventing and fighting deflation, and emphasize the importance of the qualitative aspects of monetary policy and policy coordination. We find that deflation can always be prevented or overcome.

Keywords: deflation, zero bound, qualitative aspects, monetary policy, fiscal policy

INTRODUCTION

Since the 1960s, inflation has been perceived as the main threat to monetary stability and overall economic activity. Reducing inflation and achieving price stability has become the most important goal of economic policy in almost all countries. In recent years, however, another threat to price stability has emerged. Both policymakers and theoreticians have been concerned about declining prices in the industrial and emerging market economies as well (also in Poland). After an absence of more than fifty years, the “phantom menace” of deflation enters the scene again.

The aim of this paper is to survey current discussion concerning deflation. We focus our attention on two questions. First, whether deflation is perceived as a real danger for the whole global economy. Second, how governments and central banks are supposed to avoid potential deflation or, in other words, are there any solutions available to policymakers (especially to central banks) both before and after the onset of deflation. The latter problem is of crucial importance for countries like Japan, Germany and (according to some opinions) also Poland, potentially threatened by a general decline of prices.

First, taking into consideration a weak perception of deflation (after some decades of persistent inflation and regarding deflation as being of merely theoretical interest), we shed some light on definition, determinants and consequences of deflation. Second, we present opinions concerning the presence of deflation in some countries and the likelihood of global deflation in general. Third, we survey policy options and we notice that deflation can be

* Department of Banking, Poznań University of Economics

prevented. We formulate six preconditions whose presence may increase the possibilities of preventing deflation. Fourth, we describe the methods of overcoming deflation, if it has taken hold. Fifth, we conclude and draw some implications addressing economic policy. We stress the role of qualitative aspects (credibility and transparency of anti-deflationary policy) in tackling deflation and the importance of flexibility in central bank's actions. We also emphasize the need to coordinate two main domains of economic policy – monetary and fiscal policies.

1. DEFLATION – DEFINITION, DETERMINANTS AND CONSEQUENCES

Deflation is usually defined as a sustained decline in an aggregate measure of prices such as the Consumer Price Index (CPI) or Retail Price Index (RPI) (*Deflation...* 2003, p. 6). It follows that deflation is a decline in the general price level of current goods and services. Then, which is important for monetary policy, such a definition does not refer to asset prices and prices of future goods and services. Nevertheless, asset price deflation may be at times associated with or may even cause a decrease in the general level of price (Buiter 2003, p. 1).

Bernanke (2003, p. 1) emphasizes the use of word “general” in the given definition. As he points out, at any time, especially in a contemporary low-inflation economy, prices of some goods and services will be falling. Sector-specific price declines, although uncomfortable for producers in those sectors, generally do not cause problems for the economy as a whole and do not constitute deflation. The latter occurs only when declines of prices are so widespread that broad-based indexes register ongoing declines (this is, in fact, a very similar situation to identifying inflation). Additionally, there is a considerable difference between, for instance, a few quarters of deflation that is expected to be only temporary and a situation of prolonged, persistent deflation (Svensson 2003). It is not surprising, although worth noticing, that current definitions of deflation – and its understanding as well – differ from those formulated in times when deflation was a common problem, i.e. the first half of the twentieth century, when, in fact, deflation and disinflation had not been distinguished. For a survey of defining deflation in this period see Knakiewicz (1961).

Deflation, contrasted with inflation, *is not* price stability. But we should remember that it is not just the opposite for inflation, as is sometimes suggested (e.g. in Laidler 2001, p. 607–608) – both phenomena arise and widen in different way and have a distinct economic meaning. Additionally, instrument usage in

limiting deflation and inflation are different and also different are the difficulties which policymakers have to face in both cases. There are also numerous papers emphasizing an asymmetry of costs to deflation and inflation (see Buiter 2003, p. 5–6); Blinder 2000; Reifschneider and Williams 2000).

Buiter (2003, p. 6–9) lists four specific reasons why deflation is not just inflation with the sign reversed (which will be outlined further). First, when deflation occurs, the problem of a zero bound on interest rates arises. Second, redistributions from debtors to creditors associated with unexpected high deflation in a world with imperfectly index-linked debt contracts is more destructive than redistribution from creditors to debtors during periods of high inflation. Third, due to an asymmetry in nominal wage and price adjustment, the degree of downward rigidity in some nominal prices is not matched by a similar degree of upward nominal rigidity. Thus, disinflation will be more costly (i.e. the sacrifice ratio will be higher) when the inflation rate falls into a negative range than when it remains positive. Fourth, in “living memory”, as Buiter describes it, there has been considerable experience of inflation, while there has been only a limited experience of deflation.

The sources of deflation are well known. The most often given are sufficiently large negative demand shocks, which reduce spending so severely that producers must cut prices on an ongoing basis in order to find buyers. Such shocks may reflect a severe cyclical downturn, the bursting of an asset price bubble which started the problems of Japan, see e.g. Okina et al. (2001, p. 397–418); Ahearne et al. (2002, p. 2) and Table 1 or excessively tight policy (Deflation...2003, p. 9). The effects of shocks may be then amplified through a further deterioration of confidence and deflationary expectations. It must be stressed that the expectations, like in the event of inflation, play the crucial role here. Krugman (2002) presents an interesting conception, how building deflation into expectations may create a self-reinforcing deflationary spiral. (According to him, deflation in Japan is “the economy’s way of ‘trying’ to get the expected inflation it needs”).

Deflationary forces may be also transmitted across countries. This was a common fact under the Gold Standard (Knakiewicz 2001). Membership of the Gold Standard contributed negatively, imposing external constraint (fixed exchange rate) and strengthening the transmission of deflation pressures (see Table 1). Fortunately, under current circumstances, with flexible exchange rates dominance, flat money and independent policy regimes this channel of general expanding deflation is rather unlikely.

In some cases, deflation can be caused by a positive supply shock. This can arise from a variety of factors including technological innovation and productivity growth, gains from trade liberalization or heightened expectations of long-term

political and economic stability (Deflation...2003, p. 9). As Bernanke (2002b) supposes, China might be an example of such a supply-side impulse (see also Table 2). He also notes that supply-side deflation would be associated with an economic boom, in contrast to demand-side deflation, which almost in every case brings recession. However, as Cargill and Parker (2003) suggest – while costs of demand-led-deflation are visible and huge almost immediately – initially positive supply-led deflation, sooner or later, affects the economy negatively (see deflation in the last quarter of the nineteenth century in Table 1).

But as Buiter (2003, p. 14) remarks, whatever the supply-side of the economy may generate by way of a growth of potential output, it is always possible to use monetary and fiscal policy to also raise growth rate of nominal demand and therefore the inflation rate. Such a statement leads us to another source of deflation, namely inappropriate economic policy. Many authors e.g. Ahearne et al. (2002, p. 2), Benanke (2000), Krugman (1999) indicate that Japanese deflation has been, among other factors to a large extent a consequence of policymakers mistakes and reluctance. This also concerns other deflation experiences, including the Great Depression as well – see Cargill (2001), Friedman and Schwartz (1963), Meltzer (1999). The critique relates to both monetary and fiscal policies (and exchange rate or structural policies). Moreover, deflation may arise as a result of weak coordination between individual (especially monetary and fiscal) policies. This problem will be discussed in section 3. It is worth noticing that in the past, for example in the Gold Standard, deflation had been treated as a policy instrument and, in fact, was a conscious policy choice – Knakiewicz (1961); Laidler (2001, p. 607-608). It is hardly possible that in the present policymakers have or want to unleash deflation.

In current discussion, relatively more attention has been paid than to sources of deflation to the consequences of declining prices. That is just why they have inspired animated discussion among policymakers, politicians and theoreticians. Deflation is not a new problem (cf. Fig. 1), thus in the context of the recent experience of Japan and China one should assess the consequences of this process in a broader historical perspective. The lessons from the past should help policymakers to draw conclusions about the current global risk of deflation.

In the past, one could distinguish a few significant periods of persistent deflation (compare Fig. 1 – global inflation). These were: (i) during the last quarter of the nineteenth century – especially in industrial countries; (ii) in the 1930s – the most severe deflation of the twentieth century – in the United States, Japan, Sweden and other industrialized countries (also Poland), (iii) after the Second World War – in the major economies, (iv) in the late 1980s – in Canada, Norway, Sweden and Germany, and (v) in the early 1990s – in developed countries (especially Japan).

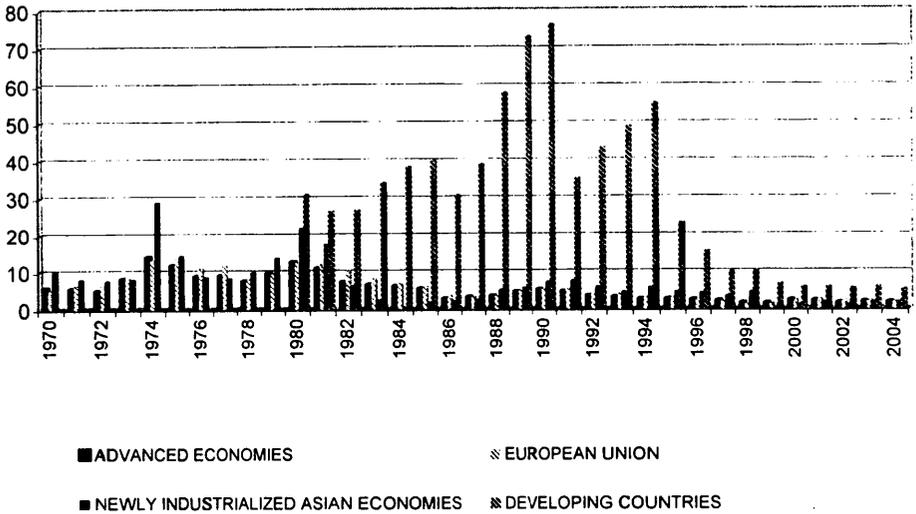


Fig. 1 Global inflation (1970-2004*)

Source: World Economic Outlook, IMF, April 2003

However, one could draw the most instructive lessons from the three previous periods – the last quarter of ninetieth century (for China), the Great Depression (for Japan and other developed countries), and lastly the first deflation period in Japan – which are characterized in Table 1.

Historically (see Table 1) deflation was identified as a reduction in money supply that does not necessarily cause bad economic performance – e.g. see Friedman’s (1968) optimal quantity of money theorem. However, even if deflation was not severe, it was widely perceived to have a negative effect on economic activity and well-being (Table 1; Kumar 2003). Nowadays deflationary episodes are usually identified as periods of recession or depression. The characteristics in Table 1 confirm a variety of deflation sources already outlined: inadequate aggregate demand, structural problems in the financial sector, rigidities in labour and product markets, large fixed nominal debts and lastly, inappropriate policies. Moreover, the policymakers should be conscious that multitude and changeability in causes of deflation result in a wider range of consequences – all the more that the costs of deflation depend on both its sources and its extent and duration (Table 1).

Table 1. Historical lessons from deflation periods

Period/range	Background	Causes	Consequences	Precise effects
the last quarter of nineteenth century/ industrial countries	- constraints imposed by the Gold Standard in time of excess demand for gold	- technological change and population growth - (favourable) supply shocks	- not long deflationary episodes - not entrenched expectations of inflationary spirals - relatively weak growth	- raising debt burdens and bankruptcies - social and political unrest - significant volatility in output growth and frequent financial crises - more severe inflation in the aftermath of the deflation time
1930s/ industrial countries (especially USA, Sweden and Japan)	- restrictive monetary policy that resulted in a drastic decline in money supply - transmission of deflationary pressures through the interwar gold standard ^d	- non-appreciation of monetary policy effects - policy errors: false assessment of collapse in prices and the large number of bank failures - lack of activity to prevent inflation ^a	- drastic decline of the consumer price index (and the GDP deflator) ^b - significant fall in real GDP and industrial production ^c - sharp increase of real interest rates	- rising real value of debt that resulted in bankruptcies and unequal distribution of income - disruption to the bank intermediation channel and the international financial channels - stock market crash and collapse of the banking system - rapid increase in government spending and monetization of deficits - acceleration of inflation in the second half of the 1930s
Poland 1930-1935	- Gold Exchange standard - underdeveloped money market - economic crisis since 1930	- policy errors: wrong strategy of overcoming the crisis (price invariability dogma)	- crisis in Poland at least 2 years longer in comparison with other countries - significant fall in real GDP	- high unemployment - pauperization of the society - fall of investment - slower investment process
mid-1980s/Japan	- overheating of the economy	- policy mistakes during boom-bust cycle (too slow reaction of the central bank against economy problems – boom-bust and downward)	- decline of the core inflation (close to zero). followed by several quarters of decline in the GDP deflator	- initially sharp improvement of growth, coinciding with a tremendous run-up in land and equity prices - then sharp fall in these prices followed by real GDP slowing to a crawl (declining or rising insignificant)

^a Sweden and Japan were exceptions.

^b During the critical period in USA (1929-33) CPI declined 24% and in Japan (1930-1931) – 30%.

^c Real GDP declined in USA (1929-1933) about 29% (nominal – 46%), in Sweden (1930-1933) – 12%, and in Japan (1930-1933) – 14%.

^d B. Eichengreen refers to the constraints imposed by the gold standard as the “golden fetters”.

Source: Authors' work on the basis of: Deflation... 2003, p. 15–17; Cargill 2001, p. 118–129; Ebrahimi 2002, p. 382–384; Knakiewicz 1967; Kumar 2003; World Economic Outlook 2002, p. 110–111

The lessons from the past show the main costs of deflation: a redistribution of income from debtors to creditors, depressed demand, and, potentially, a severe distortion of credit intermediation as collateral loses value (Table 1). Moreover, price instability, connected with deflation, is likely to increase information costs, interfere with market mechanism and allocation of resources, and make long term planning more difficult (Svensson 2003). Kumar argues additionally that while temporary deflation may not entail major costs, sustained deflation is seldom benign (*Should we be worried...* 2003; World Economic Outlook 2003, p. 11–13). Policymakers should also be aware that deflation can come suddenly and take root surprisingly quickly (therefore, as is proven in the case of Japan, it is very hard to forecast) and that unanticipated deflation involves more severe costs in each of the mentioned aspects.

The most damaging consequences of unanticipated deflation for the economy is the rising real value and burden of debt (especially long term), that causes defaults and bankruptcies, and – if deflation is unexpected – the before-mentioned (unfair) redistributions from debtors to creditors. Buiter (2003, p. 6) points out that ‘debt deflation’ (the idea first raised by Irving Fisher) was considered as an important source of financial distress (to a large extent visible in bank failures or even banking crises) by the great monetary economists of the nineteenth and twentieth century – cf. King (1994); Bernanke (2002, p. 2) underlines another aspect of this issue – deflationary recession may differ in one respect from ‘normal’ inflationary recessions. This combines with the problem (to be outlined further) that deflation of a sufficient magnitude may result in the nominal interest rate hitting the ‘zero bound’. When nominal interest rate has been reducing to (near) zero, the real interest rate paid by borrowers equals the expected rate of deflation. In a period of sufficiently severe deflation, the real cost of borrowing becomes prohibitive. Almost all types of spending – capital investment, purchases of new homes etc. – decline accordingly, worsening the economic downturn.

The consequences of deflation also involve the asset price problem. On the one side, deflation is often listed with the threats of asset price bubbles, and, on the other, such bubbles can coincide with deflation (Table 1). Ch. Romer suggests that the relevant lesson for today’s economies is that dramatic movements in asset prices can cause high levels of uncertainty, with subsequent deleterious effects on consumer spending. The 1980s–1990s experience in Japan confirms such a statement (Ebrahim 2002; Table 2). Modern theories (of asymmetric information, adverse selection, moral hazard and agency problems in financial markets) also underline the importance of the

links between balance sheet revaluation, access to credit and other sources of external finance, investment and consumption demand, and fluctuations in output and employment – see Buiters (2003, p. 7); Goodhart and Hoffman (2000); King (1994)).

Feldstein (2002, p. 3) points out the problems caused by anticipated deflation as well. Nominal wages would have to fall and the real rate of return on risk-less securities would be at least equal to the rate of deflation. Securities with greater risk or less liquidity would have to offer higher real returns. This upward shift in the yield on the entire range of private debt and equity instruments would raise the cost of capital to business, reducing investment and productivity. The problems caused by anticipated deflation are substantially worse if the sustained deflation is greater than the rate of productivity growth and than the real rate of interest on risk-free securities (for details see Feldstein 2002). Next to these arguments Cargill and Parker (2003) emphasize that deflation – even if anticipated – has the potential for additional adverse effects in the economy.

Sometimes one can consider the costs (and debatable benefits) of deflation similar to inflation costs and benefits (Buiters 2003, p. 5–9). Both inflation and deflation create uncertainty about the future path of prices, an uncertainty that is harmful in itself. In some ways, moderate deflation can be more damaging than moderate inflation, although moderate inflation is more likely to get out of central bank control and lead to rapid inflation (Feldstein 2002). However – as has been already mentioned – some economists underline asymmetry of inflation and deflation consequences (e.g. Svensson 2002, Cargill 2001).

As has been shown in Table 1, policymakers' mistakes may worsen the consequences of deflation. Bernholz (2003) and Buiters (2003, p. 53) consider the wrong policies even as the main reasons for deflationary economic performance in the past. Additionally, from a historical point of view in countries where central banks understated their power to prevent deflation and/or limited their willingness to take unprecedented action (in worsened economic circumstances) the consequences of CPI decline were much severe and long-lasting.

The biggest risk (and concern) is that temporary deflation may become sustained and a self-enforcing deflationary spiral. And, since nominal interest rates cannot fall below zero, the effectiveness of conventional monetary policy (i.e. based on short-term interest rate) can be constrained – which is of particular concern when output is weakening (*Should we be worried...* 2003). There is a general agreement as well, that deflation would pose special problems within the euro area where the combination of relative price level

adjustments among countries and overall price stability (for the euro area as a whole) can cause a period of deflation in some countries.

All these described aspects refer to measurable costs of deflation (unanticipated and anticipated) – i.e. decrease in GDP growth, consumption, employment, money aggregates (usually M2 or M3), and an increase of the cost of living index (see also Table 1 and 2). Thus, deflation may often cause similar or even more severe losses than episodes of inflation do. (This was the case in Poland, where the losses caused by deflation in the 1930s were higher than losses caused by the inflation period 1919–1923 – Knakiewicz (1967).

Convergent with Table 1 are conclusions drawn from the historical record by Rogoff et al. (*Deflation...* 2003, p. 15–16). They suggest that: firstly, deflation and deflationary expectations can take root surprisingly quickly; secondly, deflation can impose severe economic costs unless it reflects primarily positive supply shocks, and finally determined and vigorous policies can make a critical difference to ending deflation effectively and relatively quickly.

2. DOES DEFLATION REALLY THREATEN GLOBAL ECONOMY?

Taking into consideration the costs of deflation, the intensity of current discussion should not be surprising. The main questions arising in this discussion are: does deflation threaten global economy; are the large economies – USA, Germany, China etc. – experiencing deflation and, finally, should Europe fear deflation in particular. The answers – positive or negative – will determine the proper activities of policymakers in the face of deflation, the more so because, as has been mentioned, deflation can be both costly and difficult to anticipate.

Nowadays, many economists state firmly that deflation is again a real danger. For instance, Rogoff (2003, p. 8) points out that deflation arguably threatens today more countries than does very high inflation (over 40%). Moreover, if one takes into account the well-known, upward bias of the CPI – see Boskin et al. (1997); Cukierman and Gerlach (2002); Johnson et al. (2001), and delineates deflation at 0.5% or 1.0%, deflation becomes a much larger category (see Rogoff 2003, Figure 1). Rogoff's concern confirms the IMF data that among the group of industrial and large economies, episodes of CPI decline have increased from about 1% of countries in the first half of the 1990s to over 13% during 2000–2002, while cases of deflation or inflation less than 1% have increased from 5% to over 22% (World Economic Outlook 2003, p. 12).

Table 2. Great economies assessment of deflation risks in 2003

Indicators	USA	Germany	Japan	China
Price trends	corporate prices fall (much more than consumer prices), but economy-wide aggregate price levels without signs of declining; relatively stable inflation expectations	most forecasters do not expect a significant decline in inflation for 2003 (the consensus forecast - 1.2%)	prices (in majority of sectors) still have faced some downward pressures (owing to globalization process), negative inflation expectations	second deflation episode in the last four years, deflation resurfaced during late-2001 end-2002 and started to ease off by December 2002
CPI (y/y) ^a	5.5/3.0/2.5	2.9/2.4/2.5	2.5/1.2/-0.8	7.5/7.8/0.1 ^b
Aggregate Demand and the Output Gap	domestic demand buffeted by a series of shocks, nonetheless consumption is growing and widening output gap (of just over 2.5% in 2003Q1)	contracting real domestic demand, unemployment rate is rising (about 9% in 2003Q1), GDP growth is falling (for the third year running) and widening output gap (2.75%)	growth below potential, the output gap is expected to widen further, potentially increasing downward pressure on prices	real GDP growth by 8% in 2002 due to strong export increase
Asset Prices	equity markets fallen severely since peak (in March 2000), the decline in consumption cushioned by well-timed tax cuts in 2001, however household wealth is rising gradually	asset market deteriorating continuously	asset prices continued to decline (since late-1990s)	relatively good equity market performance; asset prices going up
Corporate Sector	sharp fall in industrial output (6% during 2001), the US corporate sector leading the economy into recession (PPI falling since 2001), but rates of return on capital still holding up	production weakened considerably during 2001 and 2002, and corporate balance sheet adjustments still having some way to go	record business sector bankruptcies	expanding continuously
Monetary and Credit Conditions	bank lending grounding to a halt in early 2002, but not contracted (y/y), financial sector relatively healthy	low credit growth and weak bank profitability, banks suffering asset price declines and loan losses	rapidly declining broad money growth, banks struggling under a mountain of bad loans and rapidly declining profitability	strong foreign exchange inflows pushing M2 growth rate to 18.5% (y/y) in 2003Q1, headwinds from an underdeveloped interbank market

Policies	remarkable flexibility in responding to the economic shocks, the readiness of the central bank to use unorthodox policy measures to prevent deflation, the stock of government debt appears to remain stable	MP geared to the euro area where general price pressures are not deflationary. FP aiming at moving the fiscal deficit back under 3% (constrained by Stability and Growth Pact), the automatic stabilizers offering some protection against sustained deflation	BoJ eased MP (lowering overnight rate toward its floor 0.5% by the late-1990s) insufficiently, so far there is little evidence that its actions have been sufficiently aggressive to dent deflationary pressures	despite improvements, shortcomings in China's institutional framework, which reduce the effectiveness of indirect MP instruments, and China faces medium-term fiscal pressures
Experts' opinion				
K. Rogoff et al.	- no significant risk of deflation (however some factors of deflationary pressures)	- mild deflation is fairly likely	- only marginal signs of deflationary pressures	- risks of deflation intensifying (from the demand side as well), however risks of persistent deflation is small
M. Feldstein	- deflation, if it exists, is too limited to cause problems in either wages (which have been increased) or interest rates	- official statistical measures indicates no deflation (but price indices overstate inflation)	- continuous deflation problems	-
IMF Economic Forum	- despite the lingering effects of the bursting of the equity price bubble, the risk of deflation appears low (reflecting i.a. the availability of policy stimulus)	- Germany (suffering from a weak macroeconomic environment, increasing output gaps, high unemployment and financial sector strains) faces a risk of deflation	- ...	- China (as well as several other Asian economies) is experiencing serious deflationary pressures

^a In 1980-1989/1990-1999/2000-2003 (IMF, World Economic Outlook databases)

^b China – Hong Kong: 2.5/1.2/-0.8.

Source: own study on the basis of: Deflation... 2003, p. 38-61; K. Rogoff 2003, Table A1; *Should we be worried...* 2003; World Economic Outlook 2003, p. 34-37

The other quoted economists also try to find a reply to the above-mentioned questions. They do so relying on current studies about deflation and using four 'standard' sets of indicators: (1) aggregate prices, (2) measures of excess capacity, or output gap, (3) asset markets, (4) credit market and monetary indicators. For each set, several variables are used to make the assessment more comprehensive. In addition, structural characteristic and possibilities of policy actions are taken into consideration (cf. *Deflation... 2003*, p. 19–20). The summary of literature investigation is contained in Table 2. It must be emphasized, however, that an unambiguous assessment of the global economy situation (and the situation of individual economies as well) is quite difficult in the face of ever-changing and uncertain environment, and awareness of the overstatement in price indices (see the last line of Table 2). Trying to limit such problems, Rogoff et al. (*Deflation... 2003*, Appendix 1) have constructed a new aggregated indicator – Index of Deflation Vulnerability – to standardize the evaluation of deflation risk. However, even scores of this indicator are not clear.

As we can see in Table 2, there is no doubt that deflation is a real problem in Japan, and there are countries where more or less serious deflationary pressures (China), risk (Germany) or susceptibility to deflation exist. In these countries, the characteristic causes of deflationary pressures have appeared – falling prices, consumption and output, rising unemployment, asset prices and money growth volatility or decline, widening output gap, and at last overall uncertainty (Table 2). However, analysing Table 2, it seems to be demand-led deflationary pressures in Germany, and supply-led – in China, while in the USA we can see both (demand-led and supply-led) factors. Thus the discussion about deflation threats, prevention, and other 'medicine' is not unfounded.

Policymakers and central bankers should also pay more attention to the risk that deflation vulnerabilities, particularly in Japan and Germany, are intensifying and can be transmitted to other regions, and ultimately result in global deflation (repetition of the Great Depression). However, Schoenholtz (*Should we be worried... 2003*) defines that risk as remote, considering policymakers being alert to counter any contractionary shocks from abroad. According to IMF Report, the scope for bilateral transmission of deflation is also limited (*Deflation...2003*, p. 11–12). However, a deflationary spiral in a major economy could trigger a substantial shock elsewhere. Rogoff et al. (*Deflation... 2003*, p. 35) suggest also that the global effects of depreciation in a large country can be significant. For instance, depreciation in the US dollar surely would put a downward pressure on foreign prices (*Deflation...2003*, p. 35).

3. POLICY RESPONSE – PREVENTING DEFLATION

Assessment of deflation risk in the large economies shows that deflation is an actual problem, not only a theoretical curiosity. Moreover, as Feldstein (2002, p. 4) points out, regardless of the final assessment of deflation risk, low inflation makes a slip into deflation clearly possible. Therefore, low inflation rates in many countries (also in Poland) make this question even more important. In this context, the question arises of what should the policymakers do to reduce the problem of deflation. First and foremost we discuss the role of central banks and monetary policy in tackling deflation. Nevertheless, central banks cannot do this on their own, so we review also the discussion concerning the other fields of economic policy and consider the role of policy coordination in reducing deflationary threats.

Given the costs of deflation one should stress the necessity to prevent the onset of deflation (not to allow for a possibility of deflation becoming entrenched) and to reduce the risk of deflation appearance as well. The idea that the best way to avoid potential massive cost connected with deflation is to prevent it, is, as Bernanke (2002, p. 3) points out, nothing more than common sense. Problems arise when central banks try to apply such a recommendation, especially in a low inflation environment. To a large degree, this is due to the already mentioned difficulties with anticipating deflation. But, as Buiters (2003, p. 53) stresses, deflation can always be prevented. Other economists (i.e. Reinhart, Kumar, Hopkins, Bernanke, Rogoff, Ch. Romer) agree with this assessment. Also history shows that economic policy is capable of preventing or even curing deflation (Table 1).

As deflation (like inflation, if we assume that the fiscal theory of the price level does not hold) is ultimately a monetary phenomenon, monetary policy plays a particularly key role in these actions. In the context of prevention, Buiters (2003, p. 13–16) considers conventional monetary policy actions – defining them as any changes: (i) in the quantity of base money (expansion), (ii) in the short nominal interest rate (reduction), or (iii) in the exchange rate (devaluation), all three of them, at given prices and activity levels, do not change the financial net worth of the state (the consolidated general government and central bank), now or in the future. Then, he links conventional monetary policy with a subset of the state's financial portfolio management. This includes the sale and purchase of long-dated government debt instruments financed by matching changes in shorter-maturity instruments, changes in the currency composition of the government's financial assets and liabilities.

Planning its preventive operations, central bankers (and other policymakers) – as Rogoff et al. emphasize (*Deflation...* 2003, p. 31–32) – need to be attentive to four channels through which deflationary forces can be propelled and through which policy acts – closely connected to the mentioned sources of deflation:

- exchange rate channel: an open trading system can serve as a buffer, while a fixed exchange rate system has, in the past, transmitted deflationary shocks;
- asset price or portfolio rebalancing channel: deflation affects the relative trade-off between assets, and cash generates a risk-free rate of return (equal to the rate of deflation), discouraging risk taking;
- expectations channel: entrenched expectations help determine nominal wage demands and *ex ante* real interest rate; once deflationary expectations set in, they help to drive up real wage costs and real interest rates;
- credit channel: when deflation reduces the value of collateral, banks find it difficult to discriminate credit risks, and the external finance premium rises; banks in distress may curtail lending, further driving down output and prices.

Other researchers point at historical experiences that show other important channels, including nominal wage rigidities and distortion in credit intermediation, through which deflation exerted adverse effects (*Should we be worried...* 2003). However, the classification of Rogoff et al. (and also e.g. Ahearne et al. 2002, p. 24–24) embraces to some extent all the main transmission channels.

In this context of policy effectiveness in preventing deflation, we formulate and point out six (pre)conditions to strengthen central bank (pre-emptive) actions: (1) the reasonably set inflation target (buffer against the risk of deflation), (2) proper institutional framework allowing central bank to act flexibly and unconventionally, (3) monetary and fiscal policy coordination, (4) flexible exchange rate regime, (5) contribution of globalization and market forces and (6) sound financial system. Providing these conditions could enable the central bank to prevent deflation using conventional instruments.

(1) Many economists strongly advocate price stability as the best goal in conducting monetary policy, emphasizing the great progress that has been made in recent years in bringing inflation down and achieving essential price stability. However, consensus, of how such a goal should be practically formulated, has not been reached yet. Some policymakers argue that loosely

understood price stability – like accepting a low but significant inflation rate – i.e. 4% – would be a proper solution to avoid deflation risk. The argument, often quoted in discussing monetary policy goals, are downward nominal rigidities (see King 1999, p. 17–18; Buiters 2002, p. 35; Akerlof et al. 1996). It is assumed that – by zero inflation targeting – they will lead to a large inefficiency in the allocation of resources (i.e. labour). Akerlof et al. also argued that at inflation rates below 3%, the existence of permanent trade-off meant that unemployment would rise. However, according to King (1999, p. 19) these arguments are not in favour of abandoning the pursuit of price stability at all – the majority of economists still prefer this stability, precisely defined, as a goal of monetary policy. An exhaustive review of discussion about the best formulation of monetary policy goal present: Blinder (2000), Cargill (2001, p. 134); King (1999, p. 32–36), Taylor (2001, p. 46–47), Fischer (1994, p. 31–40), Svensson (1999, p. 4–10; 2000, p. 3–5), Summers (1999, p. 625–631), Vinals (2001, p. 113–157) and Mishkin (2000).

The conclusion of these studies is that inflation (not price level) targeting is the best regime for monetary policy, and not only in the context of preventing deflation. Also Cargill and Parker (2003) suggest that inflation targeting has been advanced primarily as a method to prevent inflation; however it is equally useful in preventing deflation indeed. However – as it is emphasized in those studies – the target should be a specific positive inflation rate (generally between 2% and 3% per year). Rogoff et al. (Deflation... 2003, p. 45) list three relevant considerations: firstly, a small positive rate would reduce the likelihood that countercyclical monetary policy becomes constrained by the zero floor on nominal interest rates; secondly, the potential dispersion in trend inflation across members of a currency union may be large; and finally, small inflation may facilitate relative price and wage adjustments in an economy where agents are averse to nominal wage or price cuts. Svensson (1999, p. 36) and Summers (1991, p. 628) also suggest that a small positive rate of inflation is more likely to be a credible goal than a zero rate (see Summers 1991) or 4% and more (see Svensson 1999). Svensson (2003) remarks also that it is very important that the target is symmetric and unambiguous (and is perceived as such).

Summing up, central banks need to set their targets to provide a ‘buffer’ against the risk of deflation (and to avoid described problems). Providing a buffer zone is needed to obtain security that an unanticipated drop in aggregate demand will not drive the economy into deflationary territory (to lower the nominal interest rates to zero, because measures rate of inflation overstates the “true” rate of inflation, for the sake of the above-mentioned several bias in

standard price indexes that are difficult to eliminate in practice). As a similar solution, Blinder (2000) proposes applying by the central bank a non-linear reaction function. Nonetheless, Bernanke (2002b, p. 3–4) suggests, the benefits of a buffer zone should be weighted against the costs of higher inflation rate in normal times as well.

(2) It is often argued that in a very low inflation environment, when the fundamentals of the economy suddenly deteriorate, pre-emptive and aggressive actions of the central bank are required. That issue emphasizes a need of flexible monetary policy, which enables central banks to aim at a price stability goal in the long and medium term, and respond to shocks in the short term (Sterne and Allen 2001). Such flexibility means promptness with what central bank neutralize shocks (Wojtyna 1999). Additionally, central banks admit using (and are admitted by markets and law) unconventional instruments in unusual situations – i.e. deflation.

The problem of a proper institutional framework refers clearly to the “rules vs. discretion” debate. In this context, a flexible monetary policy can be seen as “constrained discretion”. As Bernanke (2003, p. 2) points out, on the one side “under constrained discretion central bank is free to do its best to stabilize output and employment in the face of short run disturbances, with the appropriate caution born of imperfect knowledge of economy and the effects of policy”. On the other side, Latter (2003) remembers that a too discretionary regime might lack credibility. By “constrained discretion” central banks must also maintain a strong commitment to keeping price stability, and, hence, expectations of inflation and deflation, firmly under control. Therefore, two issues are important. First, as Reinhart argues, it is better for a central bank to make a circumstance commitment than time commitment, because deflation pressures are difficult to foresee (*Should we be worried...* 2003). A similar proposal is by suggested Rossow (2002), namely “escape clauses” – owing to the forward-looking nature of monetary policy (especially an inflation targeting regime) – which detail the conditions that would allow the central bank to miss the target. Second, because of time lags in monetary policy, keeping inflation under control may sometimes require a central bank to anticipate and move in advance, which means to engage into “pre-emptive strike” on inflation, which may be hard to explain to the public and, in turn, induce deflationary forces (Bernanke 2003, p. 3). On the other hand, a pre-emptive strike on deflation may be perceived as a policy mistake, leading to overheating the economy.

Nevertheless, there are many economists supporting this quite controversial postulate of allowing pre-emptive actions, arguing that:

- by moving decisively and early, the central bank may be able to prevent the economy from slipping into deflation, with the special problems that it entails (Bernanke 2002b, p. 4); (“it would be better to make a pre-emptive strike against deflation than to have to try to reverse it once it’s set in” (Latter 2003, p. 32));
- one or more of above-mentioned channels could be not available – then a vigorous policy responses are required (*Deflation... 2003*, p. 32);
- past episodes (i.e. Japan in mid-1990.) suggest that sustained deflation can be unanticipated, even as inflation and nominal interest rates fall close to zero (*Deflation... 2003*, p. 32);
- if the action of central bank is too aggressive and deflation turns into inflation, the latter can be cured by means of conventional instruments and methods (especially when the central bank is highly anti-inflation credible), and compared with the costs of entering into deflation, the costs of excessive monetary loosening would have been relatively limited (Ahearne et al. 2002, p. 4–5, 37);

Feldstein (2002, p. 4) suggests that such a strategy generally may be effective, yet he also considers it dangerous. L. Ball also shares this opinion. He suggests (on the basis of the Japan’s example) that simply pursuing fairly aggressive open-market operations and expanding the monetary base at even 30-40% a year may be not enough to lift the economy out of deflation. Additionally, the impact and results of aggressive central bank actions is usually uncertain – they may turn out to be too weak (insufficient) or too strong (rising inflation). Then, as Ball says, “if traditional policy tools are lacking, there’s a substantial risk that an adverse shock could lead not just to a temporary downturn but to long stagnation” (*Should we be worried... 2003*). Undoubtedly, such a risk exists; therefore, paying great attention to the framework of flexible monetary policy – legal as well as actual – is needed.

Lots of arguments for and against pre-emptive actions of central banks supplies discussion about central banks and asset price bubbles (see e.g. Okina et al. 2001; Bernanke 2002a; Borio and Lowe 2002) – especially as the latter could lead to deflation as Japan’s experience showed (Table 1). The debaters point out the potential (positive and negative) consequences of pre-emptive actions, and the importance of the financial sector condition (this issue is outlined in a following part). The most controversial problem here is whether the central banks should respond to fluctuations of asset prices. In this context, we should remember that definitions of deflation (and inflation as well) do not include a decline in asset prices (see more Kiedrowska and Marszałek 2003).

(3) Ahearne et al. (2002, p. 6, 37–38) point at the combination of both fiscal and monetary loosening that would have been strongly desirable, as it would have reduced the need to rely too heavily on each instrument individually, and thus would have moderated some of the drawbacks associated with pushing either instrument too far. Buiter (2003, p. 14, 40–41) even argues that the distinction between monetary and fiscal policy instruments is an unimportant definitional issue, and that fiscal or mixed monetary and fiscal policy options will always be able to boost nominal aggregate demand. These statements confirm the necessity of monetary and fiscal policy coordination – the more important by weakening of policy instruments influence during deflationary economic performance. A potential lack of coordination will probably result in protracting deflation.

Coordination which should be understood nowadays as the process through which two independent authorities negotiate their strategies in order to improve results for both (Marszałek 2003), finding expression in optimal policy mix, always succeeds in boosting aggregate demand (and of course is beneficial to achieving other policy goals. However, the establishment of properly functioning coordination mechanism has recently been much complicated. This is mainly due to the increasing independence of the central banks. An independent central bank may weaken relations with fiscal authorities. Problems may stem from one of three causes (or a combination of them): (i) the fiscal and monetary authorities might have different objectives; (ii) the two authorities might have different opinions about the likely effects of fiscal and/or monetary policy actions on the economy (they may adhere to different economic theories), and (iii) the two authorities might make different forecasts of the likely state of the economy in the absence of policy interventions.

As a result, in such a situation coordination is weak, and none of the policymakers achieve their target (Blinder 1982). As Andersen and Schneider (1986) point out, “when we have two independent authorities, who act in their own selfish interest, then we quite often observe a conflict over the ‘right’ policy direction. This effect should be kept in mind when – quite often – the argument is put forward that an independent monetary authority should be created”. A situation where the government and the central bank do not cooperate and the consequences of this, has been examined in numerous papers. Almost all of them show that non-cooperative behaviour leads to suboptimal states of the economy and increases variability of price and output levels – e.g. Alesina and Tabellini (1997); Bennett and Loayza (2000); Frankel (1998); Nordhaus (1994).

Potential lack of coordination will result in a suboptimal economic performance, so it will harm anti-deflationary policy (it was so in Japan). Additionally, as Cargill (2001) emphasizes, central bank independence may have a constraining influence on its policy. It manifests itself in an “independence trap” (central banks even become “prisoners” of their own independence), in which a central bank, concerned with its independence, is reluctant to implement new policies to deal with deflation and to coordinate with the fiscal authorities (cf. also Cargill and Parker (2003) where different aspects of independence oversold are analysed). But we should not mean that the independence of central banks is an obstacle for coordination, which cannot be overcome. To improve macroeconomic performance, both independence and coordination are necessary (see Marszałek 2003).

(4) The relationship of inflation performance and exchange rate regime is not unambiguous. Nonetheless, the last studies of Reinhart and Rogoff have shown that limited flexibility and freely floating currencies are characterized by best inflation performance (Rogoff 2003; Rogoff and Reinhart 2003). One must also note that a fixed exchange rate is conducive to translate changes in the real economy to downward pressures of prices – see Hong Kong example – Krugman (2002); Latter (2003). K. Rogoff et al. (Deflation... 2003, p. 34) shows that an open trading system under flexible exchange rates contributes significantly to protection from deflation. With flexible exchange rates, and liberal trade and account regime – while there is an incipient downward pressure on tradable good prices and interest rates (because of deficient domestic demand) – the pressure on interest rates would lead to currency depreciation and aid exports. Under such circumstances, expectations of deflation are less likely to take hold. But the risk of deflation (spreading from imported deflationary impulses) still needs to be alert as a rule. With flexible exchange rates, the threat of an internationally transmitted, global inflationary shock is smaller as well.

(5) The globalization issue is equally important as it contributes to better monetary policy performance and stimulates positive market forces. The opinion that the mutually reinforcing mix of deregulation and globalization is supporting world-wide disinflation has been more often accepted (see e.g. Rogoff 2003, p. 17–19; Wagner 2001, p. 24). Recently, globalization, deregulation and the IT revolution have given a boost to productivity growth, reducing inflationary pressures. In addition, both theory and empirics suggest that more competitive economies have more flexible nominal prices. Rogoff’s studies (2003, p. 19–21) suggest as well that it is easier to credibly sustain low inflation (not being trapped by deflation) in a competitive economy than in

monopolistic one. In addition – Rogoff et al. (Deflation... 2003, p. 24) argues – globalization, lowering barriers to trade, can help in spreading the adjustment to demand shocks. Instead of a large adjustment by a single country, a small adjustment globally could help to redress country-specific imbalances. In the same time, one should be aware that just the threat of globalization triggered off discussion about global deflation.

(6) Discussing the issue of preventing deflation (pre)conditions one should also encompass an aspect of sound financial sector and stress the other – next to monetary policy – areas of central bank activity, namely regulatory, supervisory and safety net, and central bank cooperation with institutions responsible for these issues (see e.g. Okina et al. 2001, p. 446–447). Thus, the central banks equipped with the possibility to act preemptively and flexibly (using indirect instruments and signalling its actions) also need properly and possibly quickly responding financial institutions. In other words, for the effectiveness of central bank actions, a healthy, well capitalized banking system is important (which to a large extent can deal with liquidity disturbances and the loan losses problem) and smoothly functioning capital markets (see also Bernanke 2002b, p. 4; Deflation... 2003, p. 32; Kiedrowska and Marszałek 2003).

To provide all the outlined conditions, an emphasis on the credibility and transparency of the central bank policy must be placed. All qualitative aspects (transparency, credibility and central bank independence) have recently become much more important in planning and realizing monetary policy. Here we analyze the (often omitted) importance of these aspects in the context of preventing deflation.

Credibility is the expectation that an announced policy will be carried out (Drazen and Masson 1994), or, as Blinder (1996, p. 11) simply puts, “matching deeds to words”. Credibility is so crucial for a central bank, as it may be a mean of both: (i) the time inconsistency (and inflation bias) problems reduction (the issue firstly pointed out by Kydland and Prescott (1977)), and (ii) lessening of costs of reducing inflation from unacceptable levels (see Christiansen and Blackburn 1989). Credibility also gives the central bank greater tactical or even strategic flexibility. A credible central bank policy helps to mould inflation (or deflation) expectations to be conducive to monetary policy goals. Generally, a credible central bank will find it easier to realize its main goal – achieving price stability, which, as has been said, also includes reducing deflation.

Achieving credibility is closely connected with gaining greater transparency. The latter may be understood as the extent to which the external

presentation of the decisions corresponds with the internal decision making (Ferguson 2001; Walsh 2001). This qualitative aspect (beside contributing to greater credibility) is also crucial to achieving price stability by promoting predictability in the behaviour of central banks, reducing uncertainty for economic agents and also improving the accountability of the central bank. Therefore, during the 1990s the central banks were giving increased emphasis to broader and more frequent explanations of what they are doing. They have treated openness as a way to avoid misunderstandings or confusion regarding their policy actions and as a way to gather support for policy initiatives – which is especially important in worse (deflationary) economic circumstances (see e.g. Kiedrowska 2002).

In principle, none of the formulated pre-conditions will be effective if the central bank is not credible (this also concerns of course the policymakers). High (inflationary and deflationary) credibility in formulating goals and conducting policy enables a central bank to act flexibly to prevent deflation (this also concerns exchange rate policy, if it lies in the central bank's hands). For instance, Buitert (2003, p. 33) proves that the effect of a cut in current nominal interest rates can be leveraged through credible announcements of future cuts in interest rates. This will be so, because the public perceives the central bank as honest and determined to overcome deflation. Therefore, it formulates its expectations favourably to the central bank.

The central bank also needs transparent instruments to act quickly (quickly influence the market expectations and actions) and properly (clearly) communicate with the markets (Kiedrowska 2003). Bernanke and Gertler (1999, p. 17–51) emphasize that transparency would ensure a continuity in monetary policy (or at least of increasing the likelihood that future policy would take the same general approach as recent policy has taken), and enhances the stabilizing properties of forward-looking policies (especially by explicit inflation targeting).

Both credibility and transparency are important to establish proper coordination between monetary and fiscal actions, because they provide coherence of the overall macroeconomic programme and are conducive to identification of policymakers' responsibilities. Additionally, qualitative aspects positively influence market forces (due to transparency, a possibility of "punish" or "reward" policymakers' appearances and thus – to discipline them), and create a framework to financial sector development (due to the greater predictability of policymakers' operations) (Kiedrowska and Marszałek 2002). Consequently, improving credibility and transparency creates an environment more resistant to deflation.

The formulated pre-conditions, strengthened by qualitative factors, play a crucial role in lessening the risk of persistent deflation, and offer the central bank the possibility to be more effective in preventing deflation by implementing expansionary monetary policy, even by using only conventional (sometimes, however, used in non-conventional way) instruments (i.e. open-market operations, foreign exchange swaps, standing facilities) to expand the monetary base.

Nevertheless, economists more and more often also look to fiscal policy (which, in short, includes any change in public spending or tax rules; Buiter 2003) in helping monetary policy prevent deflation. Fiscal stimulating policy and additional fiscal loosening – beyond the automatic stabilizers – can play an important role in supporting incomes, relieving pressure on firms' and households' balance sheets, and underpinning confidence (Rogoff 2003, p. 34). Simulations of Ahearne et al. (2002, p. 6) suggest that a moderate amount of additional fiscal loosening would have sufficed to prop up economic activity and keep inflation from turning negative. Such actions could be even more effective, if supported by widely understood structural reforms that eliminate the savings-investment gap (Krugman 2002).

4. POLICY RESPONSE – CURING DEFLATION

Despite all precautions deflation still may occur, damaging the economy. Thus, another challenge the policymakers face is how to cure deflation. First we explain the basic problem in curing deflation, i.e. liquidity trap. Its overcoming is essential to getting the economy out of deflation, thus, the methods of getting out of liquidity trap are simultaneously measures to reduce deflation. We describe those measures and again stress the role of qualitative factors and policy coordination also in this stage of anti-deflationary action.

There is a wide range of instruments suggested in the literature, sometimes very unusual. Before describing them, it is worth noticing that some preventive measures as well as the pre-conditions presented above may also be useful as instruments of reducing the deflation problem and favourable circumstances to reverse deflation pressures. However, once deflation already appears, "classical" actions will unlikely be possible. This is a result of the problem of "zero bound" on short-term nominal interest rates closely connected with so-called "liquidity trap".

The problem of zero bound is broadly discussed in the literature (see e. g. Buiter 2003; Goodfriend 1997, 2000; Meltzer 1999; Orphanides and Wieland 1999; Svensson 2000, 2003; Wojtyna 2001; Wolman 1998). Yet the liquidity trap (the name is due to Robertson; Blaug 2000, p. 697) is not a new issue. It has been already suggested by Keynes (1936), and afterwards, thanks to Hicks and Hansen, presented formally in the IS-LM model (see Snowdon et al. 1997, p. 100–114 or Wojtyna 2001). But only the recent experiences of Japan and the United States have revived this problem, in the context of anti-deflationary policy and monetary policy effectiveness. Such a perspective we adopt in our paper.

The essence of the zero bound (and central bank instruments uselessness in fighting deflation) amounts to the fact that the nominal interest rate cannot be less than zero. As Goodfriend (1997) points out, it is the consequence of the fact that no one will lend money at negative nominal interest rate if cash is costless to carry over time (or, as Wolman 1998 remarks, “no one would choose to hold assets bearing a guaranteed nominal return when they could instead hold money, which bears a guaranteed zero nominal return”). It may be a severe obstacle for monetary policy if it would like to stimulate the economy in order to overcome both deflation and recession. The central bank can only lower its interest rates to zero, but with deflation and expectations of deflation (which might be already well anchored), the real interest rate (as it results from the Fisher equation) may still be higher than the level required to “push” the economy out of recession and to reverse the decline and expectations of further decline of prices (cf. Goodfriend 2001; Svensson 2003; Wolman 1998).

However, this is merely the beginning of problems for the central banks. The economy is “caught” in a liquidity trap, which Svensson (1999) defines as “a situation with zero interest rate, persistent deflation and persistent deflation expectations”. (Other definitions also stress a large output gap, which calls for a monetary stimulus (*Should we be worried...* 2003)). According to Svensson, in a liquidity trap monetary policy is ineffective in the following sense: a zero nominal interest rate means that both nominal bonds and money earn the same real rate of return. Thus, bonds and excess (higher than held transaction balances) money are perfect substitutes and the private sector is indifferent to holding them.

This is the biggest concern of central banks, because in such conditions any expansionary open-market operations expanding the monetary base have no effect on nominal and real prices and quantities. The private sector just holds the increased monetary base instead of bonds and the real interest rates remain

unchanged. The policy is ineffective (cannot raise the aggregate demand and thus end deflation) at least as long as there are still outstanding government bonds (used in these transactions) and as long as deflationary expectations persist. The economy is satiated with *narrow* liquidity. (Goodfriend 2000 expresses it explicitly; Svensson does not, although from his further consideration it also becomes clear). The problem is not only a semantic one. As King (1999) informs, there are two views of the zero bound problem. According to the first one, when interest rates are zero, households and firms have an infinitely elastic demand for money balances (this is the Keynesian case). Any increase in money supply is absorbed passively and there are no implications for broader measures of money; thus, monetary policy is completely impotent. In the second situation, when interest rates are zero, households become satiated with money balances and any increase in money supply has an impact on broader money aggregates and causes changes in household portfolios. As King remarks, "for there to be a liquidity trap, base money must be a perfect substitute for other assets", what of course is hardly likely. This is the case expressed by Goodfriend and Svensson, which creates some possibilities for monetary policy, discussed in this section).

The question of how severe a constraint for monetary policy poses the problem of zero bound, remains open. According to Ball, the liquidity trap is the main problem connected with deflation, but this opinion is not shared by other participants of discussion presented by IMF (*Should be worried...* 2003). Svensson (1999) lists four reasons why a liquidity trap would be undesirable. First, in the presence of distortionary taxes in the economy, a positive interest rate (or even positive inflation) implies a positive inflation tax. This would allow for the reduction of more distortionary taxes. Second, deflation, as has been already said, is not price stability. Third, probably there is no sufficient downward flexibility in nominal prices and wages in the short and medium run to make deflation neutral. Fourth, the ineffectiveness of monetary policy removes all possibilities of using this policy for stabilization purpose (of course if one believes that such a policy may be effective at all). However Cargill and Parker (2003) suggest that monetary policy has not become impotent, but has instead been insufficient to create an anticipation of future price increases. Thus, according to them, it is not accurate to refer to the problems that deflation creates for the central bank as a "liquidity trap". They describe the problem rather as a "discontinuity" in the conduct of monetary policy.

Theoretical models, due to their constructions and assumptions, are unable to give us an unambiguous answer. For instance, to evaluate the influence of

the zero bound on monetary policy, the way money demand is modelled should be considered (Wolman 1998 pays attention to that). Nevertheless, Viñals (2001) argues that the results received so far let us state that the problem of zero bound is the more dangerous: (i) the lower is the average inflation rate; (ii) the lower is the equilibrium short-term real interest rate; (iii) the more and persistent are deflationary shocks; (iv) the more reduced are other than interest rate monetary policy channels, and (v) the lower is the possibility of stabilizing the economy by use of instruments other than monetary policy.

But there is no controversy that the liquidity trap *is* a constraint and the monetary authority may be unable to use its main instrument, namely short-term interest rates. The central bank's inability to apply its conventional methods (already described) may limit its effectiveness and complicate stimulating of the economy (and fighting deflation therefore). Nevertheless, as Bernanke (2002, p. 3) says: "a central bank whose accustomed policy rate has been forced down to zero most definitely has *not* run out of ammunition". He also concludes that deflation is always reversible under a fiat money system (and it of course had not been under the Gold Standard; cf. Bernholz 2003). Even if interest rates hit zero, the central bank still has some opportunities to expand aggregate demand and economic activity (and in effect to stop a decline of prices). The most often raised proposals in literature are: (i) lowering interest rates along the yield curve; (ii) open market operations in assets other than government debt; (iii) direct loans to the market; (iv) introducing or raising an inflation target; (v) exchange rate depreciation; (vi) Swenson's foolproof way, and (vii) so-called carry tax.

The monetary authority may try to stimulate spending (in dealing with deflation) by lowering rates further out along the yield curve, that is, rates on government bonds of longer maturities (Deflation...2003, p. 36). According to Bernanke (2002) this could be done in at least two ways. First, the central bank might commit to holding the overnight rate at zero for some specific period. Such commitment would induce a decline in longer-term rates. Second, the central bank may announce explicit ceilings for yields on longer maturity. This announcement could be forced by another commitment – to make unlimited purchases of long-term securities at prices consistent with targeted yields. In both cases, lower rates over the maturity spectrum should stimulate aggregate demand and thus end deflation. As Buiter (2003) remarks, "as long as there is a positive amount outstanding of any nominally denominated government security with a positive nominal yield, monetary policy has not yet run out of steam". Such a method appears quite effective, but the crucial

problem here is the already mentioned credibility of the central bank. If the public perceives its intention as incredible, the method will fail and the real interest rates will not change.

Even after using the entire public debt in operations mentioned above, the central bank has options left. It can also expand the monetary base through purchases of foreign exchange reserves or through purchases of foreign-issued and foreign-currency-denominated securities of any maturity (and derivatives as well). In addition, the central bank could also extend its range of purchasing to private domestic securities, especially as central banks have already the well-established practice of easing requirements for private securities that are acceptable in open-market operations (cf. Buitier 2003; Deflation... 2003, p. 36). A quite similar method is also direct lending to banks and other economic agents, taking commercial papers as collateral or monetary transfers directly to the public. There are of course problems included in operations of such a kind as integrity problem, moral hazard or governance problems (Buitier 2003). Moreover, some central banks, e.g. the Fed, are relatively restricted in its ability to buy private securities directly (Bernanke 2003). All these problems, however, conceivably appears to be overcome. (It is also worth noticing that Svensson (2003) treats these methods also as precautions, calling them "contingency plans and emergency measures").

Some authors (e. g. Krugman and Posen) have proposed the announcement and immediate introduction of an inflation target as a means of escaping from the liquidity trap. This method is based on the assumption that for overcoming the zero bound problem restoring confidence and getting rid of private sector deflationary expectations is crucial (Wojtyna 2001). Although any inflation expectations would be welcome in the face of deflation, there is a threat of falling into too high and/or unstable inflation expectations. Providing a credible inflation target should help to avoid such a situation (Svensson 2003). Once again, the credibility of the central bank is of great importance here, determining the effectiveness in tackling deflation.

An example of this method is the famous proposal of Krugman (1998a), who has suggested a 4% inflation target for 15 years. As Svensson (1999) points out, a more moderate target might be more credible (as more desirable to keep it unchanged after having deflation eliminated). He also stresses that mere announcement is not likely to be enough. It should be accompanied by published inflation forecasts, inflation reports, etc. Thus, another qualitative factor – transparency – shows its importance for anti-deflationary policy effectiveness.

This method, however, has its opponents. For instance, Buiters (2003, p. 38–39) treats introducing an inflation target rather as a precaution. In his opinion, when the economy is already “trapped” such policy action will be just a “pointless gesture” or even “spitting in the wind”. Blinder (2000) is also sceptical about the effectiveness of an inflation target as a way to fight deflation. This is so, because, according to him, the credibility of such a method is rather low, although it is convincing on the theoretical ground.

Although, as Bernanke (2003) remarks, a policy of intervening to affect the exchange rate is not on the horizon, it may be an effective weapon against deflation. In an open economy a very effective simulative instrument appears to be currency depreciation (Wojtyna 2001). Svensson (2003) is convinced that the central bank could peg the exchange rate and in this way escape the liquidity trap. In his opinion, the fact that the commitment to a pegged exchange rate is immediately verifiable, and the technical possibility to always create more domestic currency may make this method more credible than introducing and executing an inflation target. An interesting proposal for use of the exchange rate channel is also given by McCallum (2000). According to him, the economy open to trade goods and securities may limit the problem of zero bound on nominal interest rates by applying a policy rule that adjusts the rate of depreciation of an exchange rate, acting in the role of “an instrument variable”, so as to meet the stabilization goals.

Despite of the benefits, an exchange rate policy also has its limits. First, in some countries, it is the common domain of both government and the central bank. As a result, competence arguments may arise and the decision process may be prolonged. Second, the success of depreciation usually depends also upon other countries (Blinder 2000). According to Coenen and Wieland (2003), such proposals have non-negligible beggar-thy-neighbour effect and at least require the tacit cooperation of the main trading partners.

A method of mixing depreciation and inflation targeting is the so-called “foolproof” way, advocated insistently by Svensson (first proposed in Svensson 2001). Such an “eclectic”, as Wojtyna (2001) describes it, solution contains three elements: firstly, an upward-sloping-price level target path to be achieved, corresponding to a long-term, small positive inflation target; secondly, a depreciation and a temporary peg, and finally, the future abandonment of the peg in favour of inflation targeting when the price-level target path is reached. According to Svensson, the country may successfully use such an instrument unilaterally. Coenen and Wieland (2003) however, argue that the foolproof way may also require cooperation with other countries.

Perhaps the most unorthodox proposal of lowering the zero floor on nominal interest rate is imposing a carry tax on currency (see Buiter 2003, p. 39–40; Buiter and Panigirtzouglu 1999 and Godfriend 2001). The conception, whose roots go back to Gesell and the nineteenth century, is quite simple: if the authorities could pay negative interest on base money (monetary base) or, in other words to impose “a carry tax” on it, the zero nominal interest floor would be removed. Once the policy-determined nominal interest rates on base money is set below zero, market-determined nominal yields on non-monetary public and private securities would follow – competition among banks to avoid the carry tax would push the interbank below zero by the cost of carry (cf. Buiter 2003, p. 40 and Godfriend 2000). Thus, the nominal interest rates at zero are only the effect of a policy decision – the authorities always have possibility to overcome it and then to end deflation.

This conception may appear technically difficult. Paying negative interest on commercial bank reserves held with the central bank, as Buiter ensures, is trivial, analogously to bank accounts held by the general public. More serious problems may accompany to paying negative interest on currency. However, modern payments technology makes it possible by embedding a magnetic strip in each bill. By recording the date it leaves an automatic teller machine and the date it is returned to a bank for the most part, currency is spent and returned to the banks by merchants, a short time after withdrawn (the longer money circulates, the higher the tax would be). Thus, the imposition of a carry tax would be collected like a sales tax (Goodfriend 2000).

Gesell’s revived proposal is strongly criticized. Even its authors admit that it may be expensive (high costs of more sophisticated bills and coins and the technical framework), and regressive since only the relatively poor hold a significant fraction of their wealth in currency (Buiter and Panigirtzouglu 1999; Goodfriend 2000). Bryant (2000) also remarks that the legislation authorizing such tax should be passed and the necessary technology put in place in advance of the need (i.e. before deflation appears) which clearly is politically impossible. Bryant also sees the possibilities for cross-border arbitrage, in the absence of adoption of such a tax by all major countries. Therefore he perceives such a tax rather as an instrument to reduce the underground economy. But taking into consideration costs, he proposes embedding a magnetic strip only in high-face-value bills. According to Blinder (2000), inflation destroys money as a measure of value. Having a currency that depreciates electronically would do the same. He also doubts that a carry tax is advisable in a country with a sick banking system (like Japan).

It is interesting how such a tax would function in countries like Poland for instance, with a relatively high fraction of currency in all money circulation. Additionally, the question arises who and how would administrate the incomes coming from this source.

The unorthodox policy actions pose a significant challenge for the policymakers, since their impact may be uncertain. Additionally, there may be little or even no guidance to the appropriate extent and timing of using them. There is also a risk that the central bank could incur sizeable capital losses if the value of purchasing assets falls (another argument in favour of prevention rather than curing deflation). Therefore, this uncertainty and costs should be compared to the potential costs of deepening deflation (Deflation...2003, p. 36). However, the view that the potential costs of intervention are likely to be much lower than those connected with persistent and deepening deflation is nowadays broadly accepted (*Should we be worried...*2003, p. 172).

Even if the deflationary problem has not been solved by any of the discussed monetary policy measures, the authorities still have some possibilities. An especially interesting option appears to be fiscal policy. A large enough fiscal impulse could boost activity, help address the problem in the credit and asset channels and bring an increase in prices of goods and assets. If deflation is due to an especially large demand shock, fiscal policy may be particularly useful in supporting incomes and spending (Deflation...2003, p. 37).

The two basic instruments through which fiscal policy may stimulate the economy are debt-financed cuts in taxes and debt-financed government investment (in the formal model these measures explains Buiter (2003, p. 41–44). The first one could have a positive effect on spending and thus aggregate demand if the Ricardian equivalence does not hold. If it does, such a policy cannot be effective (Barro 1979). This will be also the case when the public is sensitive to the problems of financing social security or other budget commitments. In that case, debt-financed cut taxes are perceived as only temporary and the public is expecting taxes to rise in the future (Goodfriend 2001). Debt-financed government investment would have a direct effect on aggregate demand. But if public capital were already overbuilt, such an action could be a costly waste of resources. Moreover, debt issued to finance investment projects creates future tax liabilities. As Goodfriend (2001) stresses, just the possibility of such tax liabilities could deter private investments by increasing uncertainty about the future return. This leads naturally to the well known crowding out effect, which makes such a policy ineffective.

Another proposal of using tax reform for reducing deflation has been made by Feldstein (2002). He considers an immediate cut in VAT rates accompanied by the credible announcement of a future VAT increase above its current level. In short, such a temporary tax is going to increase current consumption, because it becomes cheaper than the consumption in the future. What is important – and beneficial – is that this combination will not raise the budget deficit and the national debt, because it will be revenue-neutral (in the terms of present value).

The fiscal policy might be effective to combat deflation, but as it has been mentioned, this policy also has its disadvantages. Goodfriend (2001) considers fiscal instruments as “likely to be costly, relatively ineffective at best, and counterproductive at worst”. Thus, he argues, fiscal policy cannot be very useful. According to him, probably the most dangerous fiscal response to deflation would be anti-competitive interventions and regulations supporting the income of particular groups or sectors in the economy. Such intervention would distort relative prices and mark-ups and amount to off-budget subsidies financed by higher prices for the public. Thus, it can have a significant negative effect on potential output. Moreover, the fiscal policy may be limited by some external constraint (e.g. Stability and Growth Pact) and the government may be so lacking credibility that it cannot borrow (Buiter and Panigirtzoglou 1999).

However, as Feldstein (2002a) remarks, a lot of experience indicates that discretionary fiscal policy is not useful in dealing with the typical short-run stabilization policy (such a view however has been somewhat neglected recently; see Auerbach 2002, Feldstein 2002b and Wojtyna 2003 but a discretionary fiscal stimulus might be appropriate when faced with a long-term weakness (as in Japan) or with anticipated deflation. However, as is remarked in the IMF report, such a policy needs to be credible and the stimulus should not be wasted on strictly political projects. Moreover, it is also important to ensure that fiscal expansion during deflation do not give rise to a permanent increase in the budget expenditures (Deflation... 2003, p. 37).

Fiscal policy then, appears quite difficult to apply, partly by virtue of its compromise nature (due to political disputes), which makes establishing credibility difficult, and partly due to its natural limitations (see Wernik 2002; Kowalski 2001). Nevertheless, it still remains an interesting alternative when monetary policy is bounded to zero (for evaluation fiscal policy in Japan, indicating problems with applying fiscal impulses see Ahearne et al. 2002).

As Buiter (2003) points out, disinflation usually requires tax increases or/and public spending cuts. It therefore tends to be politically unpopular. Anti-deflationary policies involve measures already described, as tax cuts,

increased public spending or transfer payments so they tend to be politically popular. Moreover, as Svensson (2003, p. 30) remarks, when the economy suffers from deflation there is no conflict between stabilizing the real economy and achieving (the positive) inflation target. In this context the very embarrassing is the question raised by Buiter (2003, p. 54), why a policy program that makes economic sense and, at the same time, should be politically popular does not get implemented. Then, according to Buiter, “persistent unwanted deflation is always and everywhere evidence of unnecessary, avoidable macroeconomic mismanagement”. It leads us to the problem of coordination between the central bank and the government or its lack.

Deflation cannot always be overcome by monetary policy alone, if the central bank is restricted to conventional instruments, though it still may be done if the central bank dares to use unorthodox measures. Similarly, implementing anti-deflationary fiscal policy may also be insufficient. (There is of course also the possibility of implementing some structural reform to tackle deflation, but it is rather complementary to monetary and fiscal measures). Nevertheless, as Buiter (2003) stresses, deflation can always be overcome by the coordinated actions of the monetary and fiscal authorities. The specific combination of fiscal and monetary policy may better help to achieve the desired outcome than the individual actions of them.

In this context, a fiscal expansion financed by corresponding monetary expansion is considered in the literature (cf. Buiter 2003, p. 42–43; Svensson 1999). According to this conception, the tax cut or transfer payment is financed by issuing monetary base (directly or by the fiscal authority issuing bonds that are immediately bought by the central bank). Such fiscal expansion would be probably more effective if directed towards expenditure as imperfect substitute for private consumption so as to minimize compensating adjustment in private expenditures (Svensson 1999). What is important is that there are no future tax liabilities, implied by this transfer payment, because it is financed through monetary expansion. Such money-financed fiscal impulse would boost aggregate demand and bring the economy out of deflation.

This proposal, as Buiter remarks, is, in principle, Milton Friedman’s “helicopter drop of money” (described e.g. in Friedman 1994). It is clearly in contrast to recommendations underlying typical monetary and fiscal policy. In deflationary conditions, however, it may be desirable. The only problem, implicit in this solution, consists in the central bank’s inability to do such a “helicopter money drop” on its own. Cooperation with the fiscal authority again, like in preventing deflation, is crucial here. Thus, admittedly, Buiter

perceives the roots of persistent failure to address a deflation problem in the mutual distrust between independent monetary and fiscal authorities.

Summing up the survey of measures and methods helpful in curing deflation, we want to emphasize two issues. First, the given proposals are only theoretical to some extent. Thus, central banks should be very careful considering some usage of these methods in the real world. Second, qualitative aspects are also of crucial importance and appear to be even more important in this stage, due to the unpredictable character and uncertainty connected with the majority of the described methods. Thus, credibility and transparency may help in understanding and accepting such methods by the public.

CONCLUDING REMARKS

The current debate concerning deflation delivers an assessment of the deflation threat – in the context of individual countries as well as the global economy. The participants of the debate offer also a variety of proposals concerning policy responses. The survey of this discussion has helped us to put in order some important issues (being conclusions of our paper).

First, as most of studies suggest, although there are some countries threatened by deflation, the danger of global deflation has not been essential yet. Several arguments support this statement, namely: (i) deflation can always be prevented or, if it takes hold, overcome, (ii) both theoreticians and policymakers are aware of deflation costs, and thus more determined to react flexibly and, if possible, even pre-emptively, (iii) institutional arrangement exists which helps influence expectations properly, (iv) central bankers are more conscious of their potential and, to some extent, prepared for preventing and, if necessary, even curing deflation, and (v) the lessons from past deflationary experiences provide some guidelines and prescriptions.

Second, decision-makers should be nonetheless aware of the deflation risk, because: (i) deflation is still difficult to predict, (ii) although deflation can be prevented (and cured), some proposals of preventing and (particularly) curing deflation are only theoretical and involve a crucial risk of failure (especially in the context of policy failures in the past), (iii) the importance of qualitative aspects in anti-deflationary policy is still underestimated, (iv) lack of (one or more) formulated preconditions may make preventing/curing deflation more difficult (or even impossible). Meanwhile, there are still no simple solutions to establish, for instance, the

effective monetary and fiscal policy coordination or strengthen the financial sector (especially in emerging markets like Poland), (v) the usage of fiscal policy instruments (due to their features) is difficult and costly.

Third, the central banks should not overstate its independence or pursue price stability too tightly. In other words, central bankers have to remember that the goal of price stability also concerns eliminating deflation. This is of crucial importance in countries where the central banks do not react when the inflation rate is below the established target (as recently in Poland). However, this should not be understood as an encouragement to tolerate inflation and the abandonment of price stability.

Fourth, policymakers should fear deflation, although this concern should not tie their hands and also should not become a self-fulfilling forecast. The knowledge of deflation has recently increased and the central banks are supposed to be better and better prepared to eliminate this threat.

REFERENCES

- Alesina A., Tabellini G. *Rules and discretion with non-coordinated monetary and fiscal policy*, "Economic Inquiry", vol. 25, 1987.
- Andersen M., Schneider T. *Coordination of Fiscal and Monetary Policy under Different Institutional Arrangements*, "European Journal of Political Economy", no 2, 1986.
- Agell J., Calmfors L., Jonsson G. *Fiscal policy when monetary policy is tied to the mast*, "European Economic Review", no 40, 1995.
- Ahearne A., Gagnon J., Haltmaier J., Kamin S. et al. *Preventing Deflation: Lessons from Japan's Experiences in the 1990s*, "Board of Governors, International Finance Discussion Paper", no 729, 2002.
- Akerlof G. et al. *The Macroeconomics of Low Inflation*, "Brooking Papers on Economic Activity", no1, 1996
- Auerbach A. *Is there a role for discretionary fiscal policy*, in: *Rethinking stabilization Policy*, Conference sponsored by the Federal Reserve Bank of Kansas, Jackson Hole, 2002.
- Barro R. *The Ricardian Approach to Budget Deficit*, "Journal of Economic Perspectives", no 2, 1989.
- Bennet N., Loayza H. *Policy Biases when the Monetary and Fiscal Authorities have Different Objectives*, "Central Bank of Chile Working Papers", no 66, 2000, www.bcentral.cl.
- Bernanke B. *Asset-price "bubbles" and monetary policy*, "BIS Review", no 59, 2002a.
- Bernanke B. *Deflation – making sure "it" doesn't happen here*, "BIS Review", no 68, 2002b.
- Bernanke B. *"Constraint discretion" and monetary policy*, "BIS Review", no 5, 2003.
- Bernanke B., Gertler M. *Monetary Policy and Asset Price Volatility*, "Federal Reserve Bank of Kansas City Economic Review", Fourth Quarter 1999.

- Brnholz P. *Why deflation is still the real danger*, "Central Banking", vol. XIV, no 1, August 2003.
- Blackburn K., Christiansen M. *Monetary Policy and Policy Credibility: Theories and Evidence*, "Journal of Economic Literature", vol. 27, 1989.
- Blinder A.: *Issues in the Coordination of Monetary and Fiscal Policy*, in: *Monetary Policy Issues in the 1980s, A Symposium Sponsored by the Federal Reserve Bank of Kansas City*, Jackson Hole 1982.
- Blinder A. *Central bank credibility: Why do we care? How do we build it*. "NBER Working Papers", no 7101, 1999.
- Blinder A. *Monetary Policy at the Zero Lower Bound: Balancing the Risk: Summary Panel*, "Journal of Money, Credit and Banking", no 4, part 2, 2000.
- Blaug M. *Teoria ekonomii. Ujęcie retrospektywne [Economic Theory in Retrospect]*, 2nd ed. Wydawnictwo Naukowe PWN, Warszawa, 2001.
- Boskin M. J., Dulberger E., Gordon R., Grilliches Z., Jorgensen D. *Consumer Prices, The Consumer Price Index and the Cost of Living*, "Journal of Economic Perspectives" Fall, 1997.
- Bryant R. C. *Comment*, "Journal of Money Credit and Banking", vol. 32, no 4, part 2, 2000.
- Borio C., Lowe P. *Asset prices, financial and monetary stability: exploring the nexus*, "BIS Working Papers", no 114, 2002.
- Buiter W. *Deflation: Prevention and Cure*, "NBER Working Papers" No 9623, 2003.
- Buiter W., Panigirtzoglou N. *Liquidity Traps: How to Avoid Them and How to Escape Them*, "NBER Working Paper", no 1999.
- Cargill T. F. *Monetary Policy, Deflation, and Economic History: Lessons for the Bank of Japan*, "Monetary and Economic Studies (Special Edition)", February 2001.
- Cargill T., Parker E., *Why deflation is different*, "Central Banking", vol. XIV, no 1, August 2003.
- Cukierman A., Gerlach S. *The Inflation Bias Revisited: Theory and Some International Evidence*, November 2002, mimeo.
- Coenen G., Wieland V. *The Zero- interest Rate Bound and The Role of The Exchange Rate Role for Monetary Policy in Japan*, "Journal of Monetary Economics" no 50, 2003.
- Drazen A., Masson P. *Credibility of Policy versus Credibility of Policymakers*, "NBER Working Papers", no 4440, 1994.
- Feldstein M. *Deflation*, "BIS Review", no 70, 2002.
- Feldstein M. *The Role for Discretionary Fiscal Policy in a Low Interest Rate Environment*, "NBER Working Papers", no 9203, 2003.
- Ferguson R. *Transparency in central banking: rationale and recent developments*, "BIS Review", no 31, 2001.
- Fischer S. *The Costs and Benefits of Disinflation*, in: *A Framework for Monetary Stability*, ed. J. Onno de Beaufort Wijnholds, S. C. Eijffinger, L. H. Hoogduin, Financial and Monetary Policy Studies, vol. 27, Kluwer Academic Publishers, 1994.
- Friedman M. *The Role of Monetary Policy*, "American Economic Review", vol. 58, no 1, 1968.
- Friedman M. *Intrygujący pieniądz [Intriguing Money]*, Wydawnictwo Łódzkie, Łódź, 1994.

- Friedman M. Schwartz A., *A Monetary History of the United States 1867-1960*, Princeton University Press, Princeton, 1963.
- Goodfriend M., *Overcoming the Zero Bound on Interest rate Policy*, "Journal of Money, Credit and Banking", no 32, vol. 32, part 2, 2000.
- Goodfriend M., *Financial stability, Deflation and Monetary policy*, Federal Reserve Bank of Richmond Working Paper, no 01-01, 2001.
- Goodhart Ch., Hoffman B., *Deflation, Credit and Asset Prices*, mimeo 2000.
- Johnson K., Small D., Tryon R., *Monetary Policy and Price Stability* (unpublished), Board of Governors of the Federal Reserve System, "International Finance Discussion Papers", no 641, July 1999, www.bog.frb.fed.us.
- Keynes J. M., *Ogólna teoria zatrudnienia, procentu i pieniądza [The General Theory of Interest, Money and Employment]*. PWN, Warszawa, 1956.
- Kiedrowska M., *Ewolucja instrumentów polityki banku centralnego na tle przemian w bankowości centralnej [The evolution of central bank policy instruments against a background of central banking transformation]*, mimeo 2003.
- Kiedrowska M., *Transparency in Central Banking*, in: *Research of the Contemporary Economic Issues by Young Economists*. Proceedings of Lubniewice, Wydawnictwo AE w Poznaniu, 2002, in print.
- Kiedrowska M., Marszałek P., *Bank centralny i stabilność finansowa [The central bank and financial stability]*, "Bank i Kredyt", no 6, 2003.
- King, M., *Debt deflation: Theory and Evidence*, "European Economic Review", no 38, 1994.
- King M., *Challenges for Monetary Policy: New and Old*, in: *New Challenges for Monetary Policy*, Federal Reserve Bank of Kansas City, Jackson Hole, 1999.
- Knakiewicz Z., *Pojęcie deflacji w teorii i polityce ekonomicznej [Concept of deflation in economic policy and theory]*. "Ruch Prawniczy, Ekonomiczny i Socjologiczny", z. 2, 1961.
- Knakiewicz Z., *Teoretyczne podłoże systemów pieniężnych. Od monometalizmu i bimetalizmu do współczesnych systemów pieniężnych [The theoretical basis of monetary systems. From monometallism and bimetalism to contemporary monetary regimes]*, in: *Finanse, banki i ubezpieczenia w Polsce u progu XXI wieku, vol. 2*, Wydawnictwo AE w Poznaniu, Poznań, 2000
- Knakiewicz Z., *Deflacja polska 1930-1935 [Polish deflation 1930-1935]*. PWE, Warszawa, 1967.
- Kowalski T., *Proces formułowania oczekiwań a teoria cyklu wyborczego. Implikacje dla polityki gospodarczej [The expectations formulation process and the theory of electoral cycles. Implications for economic policy]*, Prace habilitacyjne nr 3. Wydawnictwo Akademii Ekonomicznej w Poznaniu, Poznań, 2001.
- Krugman P., *It's baaack! Japan's slump and the return of the liquidity trap*, "Brooking Papers on Economic Activity" no 2, 1998a.
- Krugman P., *Japan's trap*, 1998b, mimeo.
- Krugman P., *Further notes on Japan's liquidity trap*, 1998c, mimeo.
- Krugman P., *Inflation targeting in the liquidity trap: the law of the excluded middle*, 1999, mimeo.

- Krugman P. *Can Deflation be Prevented?*, 2002, mimeo.
- Kumar M. *Deflation. The new threat?* "Finance&Development", June 2003.
- Kydland F., Prescott E. *Rules Rather Than Discretion: The Inconsistency of Optimal Plans*, "Journal of Political Economy", vol. 85, 1977.
- Laidler D. *Deflation*, in: Newman P., Milgate U., Eatwell J. ed. *The New Palgrave Dictionary of Money and Finance*, McMillan Reference Limited, London, 2001.
- Latter T., *Deflation holds no terrors for Hong Kong*, "Central Banking", vol. XIV, no 1, August 2003.
- Marszalek P. *Monetary and fiscal policy: importance of coordination*, "Poznań University of Economics Review", vol. 3, no 2. 2003.
- McCallum B. *Theoretical analysis regarding a Zero Lower Bound on Nominal interest Rates*, "Journal of Money, Credit and Banking", vol. 32, no 4, part 2, 2000.
- Meltzer A. *Monetary transmission at Low Inflation: Some Clues from Japan in the 1990s*, "Monetary and Economic Studies.", Special edition, February 2001.
- Mishkin F. *What Does Price Stability Mean? Price Level or Inflation Target?*, 2000.
- Nordhaus W. D. *Policy games: coordination and independence in monetary and flscal policies*, "Brooking Papers on Economic Activity", no 2, 1994.
- Okina K., Shirakawa M., Shiratsuka S. *Asset price bubble and monetary policy: Japan's experience in the late 1980s and the lessons*, "Institute for Monetary and Economic Studies Discussion Paper", no 2000-E-12, Bank of Japan, 2000.
- Orphanides A., Wieland V. *Price stability and Monetary Policy Effectiveness when Nominal Rates are Bounded by Zero*, "FEDS Working Papers", no 35, 1998.
- Reifschneider D., Williams J. C. *Three Lessons for Monetary Policy in a Low Inflation Era*. "Journal of Money, Credit and Banking", vol. 32, no 4, part 2, 2000.
- Rogoff K. *Globalization and Global Disinflation*, Paper prepared for the Federal Reserve Bank of Kansas City conference on "Monetary policy and Uncertainty: Adapting to a Changing Economy", IMF 2003.
- Rossov J. *Establishing the credibility of inflation targets*, "Central Banking", vol. XIII, no 1, August 2002.
- Sterne G., Allen B. *The evolution of monetary framework design in the 1990s*, "Central Banking", vol. 11, no 3, 2001.
- Should we be worried about deflation?* "IMF Survey", vol. 32, no 10, 2003.
- Snowdon B., Vane H., Wyncarczyk P. *Współczesne nurty teorii makroekonomii [A Modern Guide to Macroeconomics. An Introduction to Competing Schools of Thought]*, Wydawnictwo Naukowe PWN, Warszawa, 1998.
- Svensson L. E. O. *How Should Monetary Policy Be Conducted in an Era of Price Stability?* "NBER Working Paper", no 7516, 2000.
- Svensson L. E. O. *The Zero Bound in an Open Economy: A Foolproof Way of Escaping from a Liquidity Trap*, "Monetary and Economic Studies", no 19, 2001.
- Svensson L. E. O. *Monetary policy and real stabilization*, "NBER Working Paper", no 9846, 2003.

- Summers L. *Price Stability: How Should Long-Term Monetary Policy Be Determined?* "Journal of Money, Credit and Banking", vol. 23, no 3, part 2, 1991.
- Taylor J. *Low Inflation, deflation, and Policies for Future Price stability*, "Monetary and Economic Studies", Special Edition, February 2001.
- Vināls, J. *Monetary Policy Issues in a Low Inflation Environment*, in: Herrero A. G., Gaspar V., Hoogduin L., Morgan J., Winkler B. *First ECB Central Banking Conference: Why Price Stability?* European Central Bank, Frankfurt am Main, 2001.
- Wagner H. *Implications of Globalisation for Monetary Policy*, IMF Working Paper, no WP/01/184, November 2001.
- Walsh C. *Transparency in monetary policy*, "FRBSF Economic Letter", no 2001-26, 2001.
- Wernik A. *Problemy polityki fiskalnej w kreowaniu policy mix [Problems of fiscal policy in creating policy mix]*, „Bank Kredyt” no 11-12, 2002.
- Wojtyna A. *Koszty dezinflacji [Disinflation Costs]*, in: Wojtyna A., ed., *Alternatywne strategie dezinflacji [Alternative Strategies of Disinflation]*, „Raporty CASE”, no 32, 1999.
- Wojtyna A. *Skuteczność polityki pieniężnej w warunkach niskiej inflacji: problem zerowej granicy nominalnych stóp procentowych [Monetary Policy Effectiveness in Low Inflation Conditions]*, „Bank i Kredyt”, no 7, 2001.
- Wojtyna A. *Polityka stabilizacji cyklu koniunkturalnego [Business Cycle Stabilization Policy]*, „Gospodarka Narodowa”, no 5-6, 2003.
- Wolman, A. *Staggered Price Setting and the Zero Bound on Nominal Interest Rates*, „Federal Reserve Bank of Richmond Economic Quarterly”, no 84, 1998.
- World Economic Outlook, IMF, April 2003.
- World Economic Outlook, IMF, April 2002.

received: September 2003, revised version: February 2004