

**Low Inflation or Price Stability?
A Look at the Issues**

by

Geoff Kenny and Donal McGettigan

The views expressed in this paper are not necessarily those held by the Bank and are the personal responsibility of the authors. Comments and criticisms are welcome.

Economic Analysis, Research and Publications Department, Central Bank of Ireland,
P.O. Box 559, Dublin 2.

“Lenin was right. There is no subtler, no surer means of overturning the existing basis of society than to debauch the currency. The process engages all the hidden forces of economic law on the side of destruction, and does it in a manner which not one man in a million is able to diagnose”. J.M. Keynes, *Economic Consequences of the Peace*, Chapter 19.

1. Introduction

Since the late 1980s, Ireland, in common with most of the industrialised world, has experienced low rates of inflation which contrast sharply with the experience of the previous decade and a half. A significant factor lying behind this regime shift was a radical change in accepted economic theory and in the views of policymakers¹. Beliefs, based on the so-called Phillips curve, that policymakers could choose a long-run low unemployment/high inflation combination for their economies were dashed after the painful experiences of the 1970s, when most countries suffered high inflation and high unemployment simultaneously². Hence the debate which previously existed, on whether an economy should, in certain circumstances, deliberately pursue long-run inflationary policies, has largely disappeared. This new era of low inflation has, however, prompted a new and more subtle debate over what the goal of monetary policy should be. Should monetary authorities remain satisfied with the existing situation of low and stable inflation? Alternatively, are there large long-term costs associated with even a low rate of inflation (e.g. of the order of 2 to 3 per cent.)? If there are, should we press on further and aim for price stability?

This paper addresses these important questions. On the one hand, we could opt to live with the status quo and, hence, pursue low and stable inflation as the primary objective of monetary policy. On the other hand, we could push for complete price stability. The issue is of central concern to the Central Bank of Ireland in the present context of low Irish inflation. In addition, it is an issue which should be high on the agenda of European policymakers as they contemplate the prospect of a centralised European monetary policy under Economic and Monetary Union (EMU). The rest of the paper is divided into four main sections. Section 2 outlines the main costs of inflation which

¹ See Taylor (1996) for a discussion of this issue.

² Friedman (1968) and Phelps (1967) provided convincing theoretical arguments as to why beliefs in a long-run unemployment/inflation trade-off were misguided.

form the basis of the argument *in favour* of price stability as the ultimate goal of monetary policy. Although many of the costs of inflation are quite subtle in their effects, it is argued nonetheless that these are likely to be important, especially in their combined impact, even at relatively modest rates of inflation. However, despite the extensive costs of even moderate rates of inflation, since a move to a regime of price stability may also involve significant costs, it is still not clear that economic policy geared towards a permanently fixed level of prices would be optimal. This issue is taken up in Section 3 of the paper where the transitory costs of moving to price stability are considered in detail. In section 4 we consider the possibility that a regime of completely stable prices may involve permanent costs over and above the costs of disinflating. Such arguments concentrate on the possibility of there being permanent unemployment costs associated with both the process of disinflation and the position of price stability itself. In addition, certain economists argue that monetary policy becomes ineffective in times of deep recession when price stability forms the backdrop. Section 5 summarises and puts forward some of the formal conclusions which can be made given the current state of economic knowledge.

Before examining the separate cases for and against price stability as the ultimate goal of monetary policy, it is important to clarify exactly what is meant by “stable” prices. In the context of this paper, price stability refers to the stability of the aggregate price index over a chosen reference period³. It does not mean that the prices of individual products do not change over time. Such prices will, of course, change in response to changing supply and demand conditions in individual markets. It is also generally accepted that the term “price stability” is consistent with at least some positive rate of *measured* inflation. This is because the Consumer Price Index (CPI), which is the most popular measure of aggregate prices, is based on a weighted average of the prices of a variety of goods and services. The weights used in constructing the index are only changed periodically and, hence, do not adequately take account of the way in which

³ This paper leaves aside the issue of whether, once the monetary authority has chosen its objective, it should choose inflation or price targeting. As Fischer (1996) describes, in the case of inflation targeting, base drift is allowed in that failures to meet the inflation target are treated as by-gones and no attempt is made to offset such failures. Price level targeting, on the other hand, involves pursuing a policy of below average inflation (or outright deflation when price stability is the target) after a period of above average inflation.

consumers tend to substitute relatively less expensive items for goods which have become relatively more expensive. This results in an upward bias in the estimates of aggregate price increases⁴. Another reason why the term price stability should be associated with at least some positive rate of measured inflation is that some non-inflationary price increases are to be expected over time in order to reflect quality improvements⁵. Recent estimates, although not explicitly for Ireland, suggest that a measured rate of inflation of about 1% is consistent with average aggregate price stability. As a result, in considering the dilemma posed in the title of this paper, what we are really talking about is a choice between living with 2% to 3% inflation or attempting to drive average aggregate price increases down to about 1% or less per annum^{6,7}.

⁴ In Ireland, the weights are changed approximately every seven years and they are based on the results of the most recent Household Expenditure Survey. Hence, what is termed the “product substitution” bias may be quite large in Ireland compared to other countries where the weights are altered more frequently.

⁵ An increase in a good’s quality, however, is not necessarily accompanied by an increase in its price. The best example of this is, perhaps, the output of the computer industry where there has been a large improvement in quality and simultaneously a large fall in price due to massive technological improvements over time.

⁶ Summers (1996a) argues that it may not be sensible to adjust target CPI for the above effects, on the basis that when people are planning for the future, it is the “sticker price” of goods and services and not the quality-adjusted change in cost that is important.

⁷ Selgin (1997) argues that the optimal policy involves allowing the price level to fall over time to reflect increases in productivity. (See also Dowd, 1995a, for a rebuttal of this viewpoint along with Selgin’s, 1995, counterarguments.) This “productivity norm” argument, which had many prominent adherents before the Keynesian revolution, offers another interesting angle to the above debate. It is, however, left aside for the purposes of this paper. We are very grateful to Professor Kieran Kennedy for alerting us to Selgin (1997).

2. The Costs of Inflation

2.1 Introduction

In this section, the various costs of inflation are outlined, thus providing the basis of the argument in favour of price stability. Following previous analyses, we make use of a somewhat artificial framework, in that we do not explore in any detail the policies which give rise to inflation in the first place. Inflation does not arise in a vacuum and, in part, reflects the actions and policy decisions of both the government and the monetary authority. Hence, for a fuller understanding of the issue, it would be necessary to examine the overall strengths and drawbacks of policy options which result in inflation and those which do not. Such an approach is, however, well beyond the remit of this paper, and the conventional style of analysis of this issue is employed throughout. Table 1 below outlines and briefly describes the main costs which are generally associated with inflation, with the most widely discussed costs being placed at the top of the table. In what follows, we first discuss these costs in general terms and attempt to evaluate their likely importance. Subsequently, based upon this discussion, we provide a tentative assessment of the likely combined importance of such costs at low, but positive, rates of inflation.

Table 1: Classification of the Costs of Inflation	
1. Shoeleather Costs	Costs incurred by individuals to avoid holding cash due to inflation.
2. Menu Costs	Costs of changing prices for businesses, such as printing new menus or catalogs.
3. Relative Price Changes	Distortions in the relative prices of goods and services due to inflation.
4. Income Redistribution	Changes in the distribution of income and wealth due to inflation.
5. Uncertainty and Risk	Increased uncertainty and risk in financial markets due to inflation.
6. Debt Repayment	Costs to borrowers of repaying loans in inflated currency.
7. Productivity Losses	Losses in productivity due to inflation-induced uncertainty.
8. Administrative Costs	Costs of government agencies managing inflation.
9. Unemployment	Costs of unemployment due to inflation.
10. Healthcare Costs	Costs of healthcare services due to inflation.
11. Education Costs	Costs of education services due to inflation.
12. Other Costs	Other costs associated with inflation.

Row	Main Costs	Brief Description
<u>1</u>	Shoe Leather	Inflation makes it costly to hold money balances. This is because currency yields no interest and other offer rates of return which are considerably less than those available on other assets. Money's twin damaged and this results in a reduction in holdings of real money balances. Such a reduction causes in the label "shoe leather" costs).
<u>2</u>	Inflation and the Tax System	Most tax systems are not fully indexed for inflation. Hence, the interaction of inflation and the tax sy: indexation of marginal income tax bands provides the government with an easy and surreptitious sour more important, however, is the interaction of inflation and the taxation of capital income. Because p reduces the real net of tax return to savers. Accordingly, inflation reduces welfare by distorting accumulation decisions.
<u>3</u>	Unit of Account and Uncertainty Effects	Inflation interferes with money's role as a unit of account by adversely affecting the signalling power through providing valuable signals to economic agents. Interference with such signals can result in anticipated inflation rates can interfere with these signals if agents change prices in an uncoordinated is, moreover, held to lead to increased uncertainty, thus further interfering with the informational role
<u>4</u>	Inflation and Economic Growth	Inflation may damage longer-term economic growth prospects. As discussed above, inflation has an a Inflation can also lower the rate of investment and productivity growth in an economy, through, for a taxation system. All the above effects can result in a lowering of the long -run growth potential of the e
<u>5</u>	Redistribution costs	Unanticipated inflation gives rise to arbitrary redistributions of income and wealth when people enga unfair. For example, when inflation unexpectedly increases, this leads to an arbitrary redistribution dependant on fixed, or less than fully indexed nominal incomes, are also badly affected by inflation.
<u>6</u>	Resources Devoted to the Financial Sector	With high inflation, it is argued that a greater proportion of an economy's resources are devoted consumption and investment. More generally, the existence of inflation involves dead -weight costs ins effects.
<u>7</u>	Asset price bubbles/Over-investment in inflation hedges	It is argued that there is a tendency for inflationary economies to develop bubbles in asset and raw ma of activity affected, which can end up being very costly for the economy. More generally, it can be incentive to overinvest in inflation hedges, such as real assets, thereby affecting the rate of productive i
<u>8</u>	Money as a Public Good	It is argued that, by holding money balances, an economic agent yields benefits not only to himself, b exchange role of money. People will be less likely to be unable to make desired purchases, or to delay will be less likely to unexpectedly issue bills for payment, or call in debts, in order to correct unexpected
<u>9</u>	Repayment tilt	With inflation, repayments on nominal debt contracts, such as mortgages, are highest at the beginning contract length. Such repayment tilt distorts the markets in which it operates. The most prominent e increases with inflation and where inflation may also make it more difficult to qualify for a loan.
<u>10</u>	Natural rate of unemployment	If inflation is associated with greater uncertainty, then it may be argued that frictional unemployment reduces the efficiency with which workers and firms are matched in the labour market.
<u>11</u>	• Long-Term Contracts • Financial Intermediation • Strike activity • Wage-price spirals • Interest rate risk premium • Credibility effects • Menu costs of changing prices • Market activity effects • Organisation of markets • Macroeconomic stability	There are, of course, many other costs associated with inflation. Increased inflation uncertainty is alle between deposit and lending rates, and to lead to a reduction in the flow of intermediated credit. This the uncertainty surrounding the long-term price level, the willingness to enter into longer term cont resources and, hence, lessens overall welfare. It is sometimes argued that strike activity is higher on av and their costs in terms of volatility of output, also heightens as inflation increases. The fact that infl premiums, can lower overall investment in the economy. The central bank may also suffer from a lac lead to a loss in the efficacy with which it conducts its policies. There are also, of course, the mer machines etc.. While such costs may be relatively unimportant in themselves, they can have wider (1985). Laidler (1990) contends that the increased cost of holding money can lead to a displacem otherwise be carried out more efficiently. Carlton (1982) argues that inflation uncertainty forces firm greater standardisation of products than would otherwise be the case. Finally, Dowd (1995a) argues stability.

2.2 *Costs of Inflation*

2.2.1 *Shoe Leather Costs*

The so-called shoe leather cost, which encapsulates the general inconvenience of economising on money holdings due to inflation, (see row 1 of the table for a description) is, perhaps, the most widely discussed and measured. In a recent paper, however, Fischer (1994) calculates that the welfare to be gained by reducing inflation from the then G-7 inflation average of 4.5% to zero would be of the order of 0.03% of (annual) GNP, a relatively minor amount. Feldstein (1996) calculates that, taking only the costs associated with the reduction of money demand into account, reducing inflation from 2% to zero would involve a welfare gain of only 0.02% of GNP. Feldstein also finds that when the seigniorage revenue is replaced with an alternative distortionary tax, overall welfare is lowered by reducing inflation from 2% to zero⁸. With the advent of financial innovation and greater competition in the financial sector, currency holdings have been falling in importance, and market-related interest payments have increasingly been made on various components of the money stock⁹. This cost has, accordingly, gradually declined in importance and should become even less significant in the future¹⁰.

2.2.2 *Inflation and the Tax System*

It is commonly argued that with widespread non-indexation, inflation interacts with the tax system and magnifies its distortions, thereby causing large welfare losses (row 2). The interaction of inflation and taxation of capital is felt to be especially distortionary; inflation reduces the net-of-tax returns to savers and distorts capital accumulation and consumption decisions. Some commentators, such as Feldstein (1996), argue that this is one of the most important costs associated with inflation. Fischer (1981) calculates that the interaction of an inflation rate of 10% and the tax system in the US results in

⁸ Feldstein argues strongly in favour of zero inflation, however, on the basis that the interaction of inflation with the tax system causes large distortions. In doing so, however, he makes the case that the effects of inflation on money demand cannot provide the grounds for arguing in favour of zero inflation. This is discussed below.

⁹ See, for example, Browne and Fell (1994) and Cronin (1994).

¹⁰ A recent study which estimates a higher shoe leather welfare cost is Lucas (1994). Lucas finds that the welfare costs of increasing inflation from a rate associated with a nominal interest rate of zero to one associated with an interest rate of 10% is 1.2% of GDP, taking account of fiscal considerations. Lucas' study is based on a double log real money balances function which, he argues, fits the 1900-1985 data well for the US.

costs which range from 0.7% to 2% of (annual) GDP. In a similar study, Cooley and Hansen (1991) estimate that such costs amount to 0.7% of GDP. The above calculations do not take account of the loss of government revenue after inflation is reduced, however. If, after a reduction of inflation, the government wished to keep its revenue constant, it would, in practice, be forced to raise taxes by some other means. Given that lump sum taxes are generally not feasible, raising taxes by other means would necessarily impose distortions, and would impact on the above welfare estimates. Cooley and Hansen find that when this revenue aspect is considered, overall welfare is lowered by reducing inflation!

More recent studies have, however, found that there are much larger costs associated with the interaction of inflation and the taxation system. One of the most recent and rigorous studies in this area has been Feldstein (1996). Feldstein argues that inflation exacerbates the capital taxation distortions that would exist even under price stability. He calculates that the annual dead-weight loss caused by a 2% inflation rate, after taking account of the above revenue effect, is a permanent ongoing cost of between 0.63% and 1.01% of GDP¹¹. The present value of such gains, using the United States trend growth rate of GDP of 2.5% per annum, ranges from 24.2% and 38.8% of (current) GDP¹².

A broader approach to this issue using Canadian data has recently been undertaken by Black, Macklem and Poloz (1993) who make use of a dynamic general equilibrium model of the Canadian economy in an attempt to analyse the (mainly tax-induced) effects of inflation. This study serves to illustrate that, due to the interaction of the various effects of inflation, the welfare losses which result can be significant. Using their model, Black et al. estimate that the welfare gains achieved by moving from a 10% inflation rate to zero are over 10% of GDP! When a constraint is added to the model, however, such that government revenue must remain constant as inflation is

¹¹ Feldstein also considers a number of the other costs of inflation informally, but does not attempt to measure them, presumably because many such costs are not amenable to accurate measurement. He does, however, argue that some of these costs could be as large as the very high cost he obtains through the capital taxation channel.

¹² Discounting an annual benefit of $b\%$ of GDP at a real discount rate of $r\%$ in an economy that grows by $y\%$ per year yields a present value of $b/(r-y)$.

reduced, these welfare gains are lower. They nevertheless remain substantial. Replacing the loss of “inflation revenue” by income taxes brings the welfare gain down to 2.1%, while using consumption tax instead leaves the welfare gain at 4.9%¹³. It should also be noted that when growth is endogenised in the model, the lowering of inflation leads to an increase in this growth rate, and the welfare gains are magnified once more to levels greater than the original 10% figure¹⁴.

2.2.3 Unit of Account and Uncertainty Effects

Several observers, such as Konieczny (1993), Howitt (1993), Freedman (1991) and Summers (1991) have argued that the main costs of inflation are associated with money’s role as a unit of account, i.e. the way in which goods and services are priced in terms of money (row 3)¹⁵. Because prices play crucially important allocational and informational roles in the marketplace, anything which interferes with such signals “strikes at the heart of the economy” in the words of Ball and Romer (1993). Most studies suggest that relative and aggregate price uncertainty increases with inflation¹⁶, thus providing a powerful argument in favour of price stability.

Such uncertainty may be important even when there are low prevailing rates of inflation. Koneiczny (1993) makes the telling comparison of money’s role as a unit of account in an inflationary environment and the way in which other units of account (for instance of distance or weight) would cause confusion if they were systematically altered in a similar manner. Imagine, for example, the puzzlement which would be caused if a unit of measurement, such as a mile, was adjusted by a steady 3 per cent. per annum¹⁷. This would be accentuated if the rate of increase remained modest but varied from year to year. This form of uncertainty would be likely to carry over to the

¹³ If the revenue loss arising from the reduction of inflation is replaced by raising corporate taxation it is found that welfare is reduced slightly as inflation is lowered.

¹⁴ The authors admit to the fact that they do not attempt to model the adverse impact which inflation has on the signalling role of prices which would “probably constitute the most important component of the total costs of inflation” (p.478). These are discussed in Section 2.2.3.

¹⁵ Indeed, Konieczny (1993) goes so far as to argue that this is the only cost which can provide strong arguments in favour of price stability.

¹⁶ See Briault (1995) for several references to relevant studies, together with the need for caution in interpreting such results.

¹⁷ After ten years of increases of 3 per cent. the length of a mile would have increased by over a third! Similarly the value of a pound would be devalued by a similar amount over the same time period at an inflation rate of 3% per annum.

general price level, even with moderate rates of inflation. Furthermore, there is even greater uncertainty caused, when in response to menu costs associated with changing prices and fixed-term nominal contracts, different sectors adjust their prices at different points in time. Given the central role of prices in the market economy, it is easy to envisage such confusion causing widespread damage. It is very difficult to quantify such effects, however, and as a result few attempts have been made to measure the welfare effects arising from the unit of account role of money in the face of a moderate inflation.

One such recent attempt to do this is Ball and Romer (1993). In their model, they assume that the aggregate price level rises steadily and that there is no confusion concerning the general level of prices. Instead, their focus is on relative price variability and the uncertainty which ensues when firms change their prices in a sluggish and uncoordinated manner. They find that, in a two period model with plausible parameters imposed, where customers and firms form longterm relationships, the welfare costs arising from the price confusion caused by inflation of 10% per annum amount to 0.25% of GNP. In addition, such confusion gives rise to a lower price elasticity of demand for most goods. This results in higher price markups on costs and, hence, lowers overall consumer welfare by an even greater amount than the first effect. It can be seen that they remain non-trivial even at low inflation rates. It is important to note that Ball and Romer's model is highly stylised and concentrates on the reduction in welfare arising from the microeconomic uncertainty caused by a steady inflation rate. This study does not consider the possibility that variability in inflation creates confusion between nominal and relative prices, as per Lucas (1973), on the grounds that such uncertainty may only be relevant to high inflation countries. Although the Ball and Romer approach is a very useful way of analysing the costs arising from relative price uncertainty, further modelling of the costs arising from this form of confusion would be very beneficial. Such new approaches may yield welfare losses which are far larger than those tentatively estimated by Ball and Romer.

2.2.4 Inflation and Economic Growth

As Feldstein (1996) argues, higher inflation may not reduce the economic growth rate and still have significant welfare effects if it reduces the level of income each year. Nevertheless, the welfare effects will be greatly amplified if economic growth is affected by inflation. Given the alleged drawbacks associated with inflation, some observers argue that inflation does indeed interfere with the economic growth prospects of an economy (row 4). Although there is plenty of evidence suggesting that high rates of inflation are unambiguously bad for growth, the effects of low and moderate inflation on an economy's growth prospects are not so clear (see, for example, the many recent empirical results discussed by Fischer, 1996). Nevertheless, as Black, Macklem and Poloz (1993) argue, it does not take a very large reduction in economic growth prospects to have large welfare effects. Such growth effects may be too small to detect in the data. In addition, they argue that, as there have not been many changes in inflation regimes over the past 30 years or so, it may be asking too much of the data to uncover an unambiguous link between inflation and growth¹⁸.

More recently Dotsey and Ireland (1996) uncovered very large general equilibrium welfare effects associated with inflation of 4% (running to over 1% of GDP per annum using M1 as the measure of money). The bulk of these costs were associated with the adverse effects of inflation on economic growth even though the impact on growth itself is very small, being of the order of 0.06% per annum. This reinforces the point made above by Black et al. and the argument of Lucas (1987) that policies which have even small growth effects can involve large welfare consequences.

¹⁸ Macklem and Poloz (1993) also provide other reasons why such a relationship may not be clear at low inflation rates. One reason may be that many of activities engaged in to avoid the effects of inflation themselves increase measured GDP. To this extent, such output figures may provide an overstatement of welfare in an inflationary environment. They also argue that there is a tendency for governments to set up programmes as the economy grows; thus there will be a tendency for governments to raise distortionary taxes as inflation falls and vice versa.

2.2.5 *Redistribution Costs*

Unexpected inflation also imposes arbitrary and iniquitous redistribution costs, both in income and, more strikingly, in wealth (see row 5)¹⁹. Fischer and Modigliani (1978), by calculating the volume of non-indexed linked assets in the U.S. economy, estimate that an unanticipated rise of just 1% in the price level would produce a wealth transfer equivalent to approximately 1% of GNP. Although for every loser there is a gainer in such a scenario, there are, nevertheless, welfare losses associated with such an arbitrary distribution of wealth. Such welfare losses cannot be estimated accurately, however, as it would involve a complex welfare function that appropriately weights the welfare of every individual. They are, nevertheless, likely to be substantial. Those, such as pensioners dependant on fixed, or less than fully indexed nominal incomes, are also badly affected by inflation²⁰.

2.2.6 *Resources Devoted to Financial Sector*

Another cost involves devotion of scarce resources - which may have been put to more productive purposes - to finding ways to deal with inflation (row 6). Leijonhufvud (1981) makes this point quite forcefully. He argues that in an inflationary environment “being efficient and competitive at the production and distribution of ‘real’ goods and services becomes less important to the real outcome of socio-economic activity. Forecasting inflation and coping with its consequences become more important. People will reallocate their effort and ingenuity accordingly” (p. 247)²¹. More generally, Leijonhufvud argues that, given the increased unpredictability associated with inflation, people will tend to substitute political lobbying for private contracts in an attempt to ensure a predictable real income for themselves. Dotsey and Ireland (1996), using a general equilibrium model, estimate that the welfare effects of the

¹⁹ See Laidler and Parkin (1975) for an earlier account of the redistribution consequences of unanticipated inflation. Bulir and Gulde (1995) provide recent evidence that higher inflation is associated with greater income inequality.

²⁰ Bulow (1982) provides a thorough account of the effects of inflation on pensions.

²¹ This argument is also made by Howitt (1990a), who contends that such misdirection of resources, together with its adverse effects on productivity, may be one of the most important costs of inflation. Dowd (1995b) and English (1996) also stress the importance of this cost.

diversion of labour to the financial sector can be as high as 0.21% of GDP at steady inflation rate of 4%²².

2.2.7 Asset Price Bubbles/Overinvestment in Inflation Hedges

Freedman (1991) argues that one of the more adverse effects of inflation in practice is “the tendency for inflationary economies to develop expectational bubbles that result in overshoots in expected prices of tangible assets and raw materials” (p. 614). This leads to overinvestment in certain types of activity, such as speculative building, and can end up having very detrimental effects (row 7). This is seen most vividly in the property price bubble which evolved in the late 1980s in the United Kingdom which, when it imploded, had widespread and damaging effects on the economy.

2.2.8 Money as a Public Good

Laidler (1990) makes a convincing argument that, given its means of exchange role, money should be seen as a public good (see row 8). This is because adequate real balance holdings minimise rent-seeking behaviour in the form of accelerating requests for payment and delaying the payment of bills. Accordingly, by reducing real money holdings, inflation may lead to an increase in such damaging behaviour²³. Laidler argues that such costs are usually ignored when discussing the costs of inflation and that more attention should be paid to this aspect of the means of exchange function of money.

2.2.9 Repayment Tilt

Inflation makes it more costly to service payments at the beginning of a loan, given that repayments are usually denoted in nominal terms. Accordingly, the real value of loan repayments falls over time in a process which is labelled “repayment tilt”²⁴. This effect is especially prevalent in longer term loans, such as housing mortgages, which leads to distortions in such markets (row 9). Konieczny (1993) uses a measure of tilt which comprises the ratio of the real value of the last to the first payment on a 25 year

²² One could envisage even greater welfare effects if the responses to variable inflation were incorporated into the model.

²³ See also Summers (1991), who surmises that such inflation-induced rent-seeking behaviour could be important.

²⁴ See Howitt (1990a) for a description of this effect.

mortgage. He calculates that this ratio is 0.61 at an inflation rate of 2% and 0.38 at an inflation rate of 4%.

2.2.10 Natural Rate of Unemployment

Friedman (1977) contends that the natural rate of unemployment may increase with inflation as relative price uncertainty is increased and the signalling power of prices is impaired. For instance, workers and firms may find it more difficult to match offers in an inflationary environment, thus leading to an increase in frictional unemployment. He concedes, however, that eventually institutions will emerge to deal with this uncertainty, thereby leaving the long-run natural rate unaffected²⁵. This latter concession is disputed by Ragan (1993), who suggests that the fixed costs of setting up such institutions could leave Friedman's initial hypothesis remaining valid, even in the longer term.

2.2.11 Other Costs of Inflation

There are, of course, many other costs associated with inflation and some of these are outlined in row 11 of the Table. Inflation may lead to a decrease in the willingness of people to enter into long-term contracts. The welfare effects of such a decline in the availability of nominal contracting have not been analysed rigorously and are, therefore, disputed. Dowd (1995b), on the one hand, argues that the effects could be quite important, whereas Fischer (1993) contends that the absence of such longterm nominal contracts probably does not have much of an impact on the economy. Ragan (1993) argues that inflation uncertainty leads to a reduction in the amount of intermediated credit by increasing the likelihood of loan default. He subsequently makes use of regression analysis based on Canadian data to support his claim. To the extent that certain classes of borrowers are dependant on bank credit this can lead to a decline in output and employment²⁶.

²⁵ Although Friedman argues that the natural rate of unemployment should remain invariant to the rate of inflation in the very long run (which, he argues, may last for decades), he does contend, nevertheless, that the overall productivity of the economy will remain adversely affected.

²⁶ See, for example, Gertler and Gilchrist (1993) and Kashyap and Stein (1994) who stress the importance of the credit channel and its effects on output.

Both Leijonhufvud (1981) and Selody (1990) argue that strike activity increases with inflation. It is argued that inflation creates uncertainty with respect to wage and salary negotiations. Such uncertainty means that negotiations are undertaken more often, providing ground for disagreement and strike activity. Selody provides some suggestive supporting data and cites the studies covered in Lacroix and Dussault (1979) as supporting this hypothesis. Also connected with the above cost is the increased likelihood of wage-price spirals in an inflationary environment, together with the damaging recessions which usually follow, as argued by Bonin (1993). Britain's boom-bust cycles since the 1970s are a classic example of the adverse effects of wage price spirals.

Another cost is the risk premium on interest rates demanded by lenders to compensate them for the possibility of unanticipated inflation²⁷. Furthermore, in an inflationary environment, the central bank may suffer from a lack of credibility which lessens the efficacy with which it can carry out its policies. Some authors, such as Konieczny (1993) argue that a zero inflation objective is the most credible, on the basis that it provides stability to money's central role as a unit of account. Selody (1990) also argues that price stability is likely to be the most credible on the basis that it is the only goal which fulfils the basic mandate of central banks. Crow (1988) also supports such a viewpoint by stating that "if the authorities were unwilling to act to get the rate of inflation down from, for example, 4 per cent, why should anyone believe that they would be any more willing to get it back to 4 per cent if, for one reason or another, upward pressures on prices led the inflation rate to rise to 5 per cent?". Feldstein (1996) also makes the argument that a history of price stability may bring a credibility bonus which helps in dealing with inflation shocks.

On the other hand, however, Summers (1991) argues that it is very difficult to persuade people that the rate of inflation will remain at zero if the costs of inflation around zero are perceived as small, while the benefit of some small inflation is seen as positive. Fischer (1993) also contends that monetary authorities which have succeeded

²⁷ A concrete example of such an effect is the risk premium demanded by purchasers of Irish government and corporate bonds, which is due at least in part to the risk of inflation. Such a risk premium can lead to an overall lowering of investment in the economy.

in keeping inflation at low but, nevertheless, positive levels have reaped rewards in terms of credibility gains. He does, however, concede that there is a possibility that a central bank with a record of zero inflation over long periods could be far more credible than any existing central bank.

Finally, there are the menu costs associated with changing prices which may have wider macroeconomic implications, the displacement of certain activities from the marketplace and the greater standardisation of products than would otherwise be the case²⁸.

2.3 Overall Assessment

A number of points emerge from the above discussion. The wide variety of costs associated with inflation and the subtlety of their effects is noteworthy. This is hardly surprising, given the varied and incredibly complex informational and allocational roles which prices perform in a market economy. Given such subtlety, it is quite possible that the above table merely represents the “tip of the iceberg” insofar as the costs of inflation are concerned. Keynes’ citation, presented at the beginning of the paper, wherein he argues that the debauching of the currency (i.e. inflation) wreaks destruction “in a manner which not one man in a million is able to diagnose” is of relevance in this regard. Given the subtle nature of many of the effects of inflation listed in Table 1 above, it is also not surprising that their welfare costs remain largely unmeasured (or perhaps even unmeasurable). Howitt (1990b), for example, argues that welfare analysis of inflation is very difficult because “the institution of money is so deeply embedded in our economy that inflation has a systematic effect not restricted to any particular market. Conventional cost-benefit analysis is ill-suited for analysing effects that are not isolated to a few markets. This difficulty is compounded by the inability of conventional economic theory to make much sense at all of the institution of money” (p. 108)²⁹.

²⁸ See Mankiw (1985), Laidler (1990) and Carlton (1982) for discussions of these three effects.

²⁹ Leijonhufvud (1981) argues even more strongly against the various attempts to quantify the welfare costs and benefits of inflation by means of the use of social welfare functions: “Is a choice-theoretical formulation always the *sine qua non* for ‘rational’ conduct of policy? ... Squeezed into the apples and oranges frame, the world is portrayed ‘as if’ understood ... When the ‘as if’ clause hides more in the way of unrecognised distortion than of probabilistic approximation of the situation, the ‘constructivist error’ is afoot. And that way lies the ‘Collectivisation of *Hubris*’ ” (p. 289). The above arguments are

Of the various costs which have been quantified, it seems clear that the shoe leather costs are relatively unimportant at moderate inflation rates and set to decline further over time. Furthermore, it remains the case that a clear link between economic growth at such rates has not yet been satisfactorily established. As discussed earlier, however, higher inflation may not reduce economic growth rates and still have significant welfare effects if it reduces the level of income each year.

Certain channels have, however, been identified through which inflation may impose large costs even at low inflation rates. For example, the way in which inflation interferes with money's role as a unit of account represents a potentially large cost of even low inflation. Such a possibility has been stressed by many observers, and is given some empirical backing by Ball and Romer (1993), as discussed earlier. The welfare effects of the interaction of inflation with imperfectly indexed taxation systems have also been much discussed and measured. As noted earlier, Feldstein (1996) and Black, Macklem and Poloz (1993) both illustrate that, due to the interaction of inflation and partially indexed taxation systems, the welfare costs of low inflations can be highly significant.

Furthermore, it is likely that the welfare costs of inflation are understated using the usual partial equilibrium style of analysis. This point emerges quite clearly from two recent general equilibrium studies of the costs of inflation- Black, Macklem and Poloz (1993), which was discussed above, and which uncovered large welfare effects of inflation, and Dotsey and Ireland (1996). The latter paper, using a general equilibrium monetary model in which inflation distorts a variety of marginal decisions, uncovered welfare effects as high as 1% of GDP per annum associated with a steady inflation rate of 4%. The authors find that, despite the fact that none of the distortions are individually very large, their combined influence involves substantial welfare effects.

Overall, it has been demonstrated that inflation can have pervasive and damaging effects on an economy, even at low rates. Taking the unmeasured costs into account

not meant to suggest a full retreat from the attempt to quantify the various costs of inflation. Their

this conclusion would perhaps be strengthened considerably. As a result, the desirability of aiming for a zero rate of inflation must be seriously entertained. Before doing so, however, we first turn our attention to the possible costs associated with attempting to achieve a zero inflation goal.

3. Price Stability - Transitional Costs

3.1 Introduction

The widespread and pervasive costs associated with inflation do not in themselves provide sufficient reason for moving to price stability. This is because there can be substantial welfare losses associated with disinflation; accordingly, the possibility that such transitional costs may outweigh the benefits of price stability must be considered. Certain authors, such as Feldstein (1996), argue that, because the welfare gains associated with price stability are permanent, while the losses associated with moving towards this state are temporary, only small gains are necessary to substantially outweigh the transitional costs involved. There exists, however, a further strand of opinion which holds that there may in fact be permanent welfare reductions associated with price stability. This section analyses the transitional costs of moving to price stability. Subsequently, Section 4 concentrates on the possibility of there being permanent costs associated with price stability and then briefly examines whether implementing strategies to “live with” moderate rates of inflation are feasible.

purpose is, instead, intended to illustrate some of the difficulties involved in attempting to do so.

3.2 Transitional Costs of Moving to Price Stability

It is widely agreed among the economics profession that there are output costs associated with disinflation, at least in the short run³⁰. Gordon (1982), for example, documents the costly nature of various disinflations over a variety of countries in the past. The ratio of the temporary reduction in real GDP to the fall in inflation is referred to as the sacrifice ratio. It is affected by many factors, including the degree of inflation inertia, the credibility of disinflationary policies, the speed of the disinflation, the level of inflation from which the disinflation is being effected, and the extent of nominal wage and price rigidity. As such, the sacrifice ratio for a particular economy should not be taken as given and should instead be viewed as being capable of influence, to a certain extent at least.

First, the sacrifice ratio may be dependant upon the credibility of the central bank. If the public do not believe the central bank's commitment to price stability then the sacrifice ratio will be large. Conversely, however, if policy announcements concerning a move towards price stability are believed by the public, then the transitional costs may well be close to zero. Taylor (1980, 1983) demonstrates theoretically that if an announced disinflation policy is credible, then inflation can be lowered without any cost in terms of lost output, even in the presence of staggered wage contracts. Furthermore, Sargent (1982) has demonstrated the plausibility of costless disinflations, using evidence from previous recoveries from hyperinflations. Buiter and Miller (1985) and Aiyagari (1990) argue, however, that fiscal policy must ultimately be supportive of monetary policy if the latter is to be credible. On a closely related front, it has also been argued that policies which make the central bank more independent may also improve the nature of the sacrifice ratio. Recent empirical studies surveyed by Eijffinger and De Haan (1996) suggest the opposite relationship appears to hold empirically, however. Such results are, in our view, highly counterintuitive, however, and would certainly warrant further research before any firm conclusions could be reached.

³⁰ Howitt (1990a) argues that there will, in addition, be redistribution costs associated with disinflation, with debtors, for example, suffering and creditors gaining.

The speed with which inflations are carried out is also important. Both Ball (1994) and Yates and Chapple (1996) have found evidence supporting the view that the sacrifice ratio is smaller if a disinflation is carried out quickly. On the other hand, King (1996) argues that the optimal speed of disinflation from a moderate initial position involves a gradual approach and that there should also be some accommodation of temporary shocks.

Briault (1995) and Edey, Funke, Kennedy and Palerm (1995) argue that the trade-off between inflation and output may become worse at low inflation rates. Any such worsening of the trade-off may arise, for example, if wage and price adjustments become less frequent when inflation is low. If this was the case the economy would have to suffer more extensive output losses as an inflation rate of zero was being approached. The latest empirical results provide a mixed picture on the above view. Ball, Mankiw and Romer (1988) and Yates and Chapple (1996) find that the tradeoff is indeed worse as inflation is lowered. Edey (1994) argues, however, that the empirical findings in this area are not conclusive. Furthermore, Edey et al. (1995) contend that contrasting the sacrifice ratios of the low inflation 1950s/1960s with those of the post-1973 period for the US, Japan and Germany do not provide much support for such a proposition.

Where markets are more flexible the scope for disinflating without large output losses is greatly improved. Estimates suggest that the costs of disinflation are lower, for instance, in economies with more flexible labour markets. See, for example, OECD (1989). Furthermore, Ball (1994) confirms that the sacrifice ratio increases with nominal wage rigidity, while Ball (1996) argues that the duration of welfare benefit payments is also an important factor in this regard. Finally, while Romer (1993) argues that the sacrifice ratio becomes lower as an economy becomes increasingly open, Ball (1994) does not find any evidence to support this.

Ball (1994) estimates that the sacrifice ratio varies considerably among countries, with some sacrifice ratios being close to zero and others approaching 3. He estimates an average sacrifice ratio of 0.72 for Ireland. Using such a ratio, together with a real discount rate of 5% it would merely take a permanent gain of 0.014% of GNP to be

associated with the movement from 2% inflation to price stability to offset the transitional costs of getting there. It can be seen from this calculation that even if a very large sacrifice ratio held in Ireland, only very modest annual gains associated with price stability would be required to offset this.

4. Price Stability - Permanent Costs

4.1 Labour Market Hysteresis

If moving to a regime of price stability from a regime of low inflation brought with it only temporary costs, as is assumed in most of the sacrifice ratio literature, the case for price stability would remain very strong. There is, nevertheless, an emerging body of opinion which holds that the costs of moving to price stability may be permanent. It is argued, for example, that policies designed to lower inflation can result in increases in unemployment which become permanent³¹. This may arise, for example, where the unemployed gradually lose their skills and find it impossible to reintegrate into the labour market after the disinflation has ended. In a paper which supports this hysteresis view, Ball (1996) contends that the main cause of the rising non accelerating-inflation rates of unemployment (NAIRU's) in the OECD in the 1980s was the tight monetary policies countries pursued to reduce inflation. He argues, moreover, that this result is crucially dependant on the unemployment benefit system: those countries which disinflated most and who made unemployment benefits payable for long periods, suffered the worst rises in unemployment. In fact, contrasting the unemployment experienced of Ireland and Italy throughout this period, Ball argues that the main reason for the varying unemployment performance of both countries was the unemployment benefit system: benefits last indefinitely in Ireland but only for six months in Italy. Ball's conclusions are highly controversial, however, and should be regarded as tentative. The idea that disinflations from the high rates seen in the late 1970s and early 1980s cause permanent increases in unemployment does not command widespread acceptability³². The fact that this may be the case for very low inflation

³¹ When a negative shock leads to a permanent increase in the natural rate of unemployment, this is referred to as full labour market hysteresis. Although it is commonly believed that the unemployment rate in most OECD countries is highly persistent, there is little support for the possibility of there being full hysteresis. See Elmeskov (1993) for a review of topic of unemployment persistence.

³² Many other factors, such as union power, labour market legislation, minimum wages and tax wedges have been suggested by various authors as the underlying causes of the increase in unemployment which occurred in the 1980s. (See, for example, Browne and McGettigan, 1993 for

rates has been gaining ground in the recent past, however, and it is this possibility which we now consider.

4.2 Downwardly Rigid Nominal Wages

Although the possibility that very low inflation rates might be costly in terms of lost output and employment was entertained by earlier observers such as Tobin (1972), the publication of a recent article by Akerlof, Dickens and Perry (1996) has led to a renewed interest in this topic. In essence, Akerlof et al. argue that inflation greases the wheels of the labour market by allowing real wages to fall even when nominal wages are downwardly rigid. Hence, although firms can engineer needed real wage cuts in times of difficulty in a positive inflation era, this may not be possible when the price level is stable. Accordingly, the reluctance of workers to countenance nominal wage cuts interferes with the ability of firms to deal with economic shocks and can, therefore, lead to closures and cutbacks. When the rate of inflation approaches zero the number of firms so constrained increases and this leads to greater output and employment losses. According to the authors these permanent costs swamp the permanent benefits of price stability.

Many arguments can, however, be levelled at the above conclusions. For instance, Gordon (1996) and Mankiw (1996) contend that, if a policy of price stability is pursued, nominal wage reductions should no longer be seen as unusual and the widespread reluctance to countenance nominal wage cuts may disappear. Gordon also draws lessons from the 1890s and the 1920s in the United States. Although both periods were characterised by price stability, unemployment did not behave as predicted by the authors. Mankiw (1996) also makes the point that, although nominal wage rigidity may cause real wages to be too high in certain periods, many firms and workers are engaged in long-run relationships, and the effects of such real wage overruns may not, therefore, be as severe as suggested by the authors. Overall, he contends that the “idea that inflation greases the wheels of the labour market is still more an intriguing conjecture than a well-confirmed theory”. Mullins Jr. (1996) argues

such explanations of the rise in Irish unemployment during this period.) Ball acknowledges this and tests for the inclusion of a variety of such variables in his regressions but none emerges as statistically significant.

that the sole focus on downwardly rigid nominal wages is misplaced. He contends that employers are left with “two degrees of freedom”, i.e. the possibility of adjusting non-wage benefits and hours of work which “should provide ample grease for the wheels of the labour market” (p. 206). Finally, as admitted by Akerlof et al. themselves, their arguments really only gather force when average productivity growth rates are quite low, as in the United States³³. In an economy such as Ireland, where productivity growth is far greater, the alleged wage rigidity costs of price stability may not be as relevant³⁴.

4.3 Monetary Policy Under Price Stability

The argument that monetary policy might be less effective under a regime of stable prices has also been put forward. Such a possibility has been labelled the *Summers effect*. In essence, Summers (1991) argues that at certain times it may be necessary for an economy to have negative real (i.e. inflation-adjusted) interest rates. For instance, in the midst of a deep recession, negative real interest rates may be a necessary tool for policymakers. As the nominal interest rate cannot be negative, given that people would move into cash if such rates were imposed, the economy foregoes this possibility when there is price stability³⁵. Thus, price stability may lead to more persistent recessions and to distortions in the capital market when there are warranted negative real interest rates³⁶.

Whether or not there are ever *warranted* negative real interest rates is, of course, open to debate. Freedman (1996) stresses that the achievement of price stability would lead to a dampening of business cycle fluctuations, given that postwar periods of deep recession have typically been preceded by periods of high inflation. If this was the

³³ Greenspan (1996) contends that if “we are getting rising productivity as the inflation rate falls, the nominal distribution of earnings will move to the right and, hence, even the issue of negative nominal changes in wages becomes less significant” (p. 48).

³⁴ It may not, however, be wise to expect the exceptionally high productivity growth rates of recent years to continue *ad infinitum*.

³⁵ There is, however, the possibility that small negative interest rates could be offered on deposits given that there might be some reluctance to convert fully to cash, given security and convenience considerations (see, for example, Bootle, 1996). Bootle dismisses, on the grounds of impracticality, suggestions that it may be possible to offer negative interest rates on cash by, for example, issuing dated notes that depreciate in value over time, or alternatively taxing note issues. It is also easy to envisage such schemes causing large welfare-reducing distortions by interfering with money’s role as a unit of account.

case, the need for negative real interest rates would be reduced. McPhail (1993) suggests that observed negative real interest rates in the past were probably due more to errors in anticipating inflation than to any economic need for such negative real rates. Furthermore, Edey et al. (1995) and Edey (1994) argue that, on the basis of historical experience, negative real interest rates occurred in periods where they were not necessary, and indeed quite damaging, as in the 1970s. Freedman (1996) contends that, even though nominal rates may be constrained at zero, this may in turn imply real interest rates significantly below their equilibrium value³⁷. It also seems to be the case that financial markets are increasingly reacting to higher expected inflation by selling bonds and causing the nominal interest rate to rise. Accordingly, the feasibility of engineering negative real interest rates, even if this were thought to be desirable, may be questionable in today's financial environment. In addition, engineering negative real interest rates is not the only demand management tool available to policymakers—exchange rate changes or fiscal policy measures can, for example, also be used.

Finally, it was pointed out by various participants at the recent Jackson Hole Symposium on “Achieving Price Stability” that monetary policy does not become powerless when it is not in a position to engineer negative real interest rates. For instance, it is widely argued that there are many direct links between money and/or credit and spending³⁸, and that many other asset prices other than short-term interbank rates are important in the monetary transmission mechanism³⁹.

4.4 Policies Designed to Live With Inflation

Although no consensus exists on the optimal inflation rate, it is widely agreed that there are costs associated with even the low inflation rate which currently prevails. An option that is sometimes put forward as an alternative to aiming for price stability is the

³⁶ See also Konieczny (1993) for a thorough discussion of the Summers effect.

³⁷ This begs the question of whether equilibrium real interest rates have been increasing over time. Freedman (1996) argues that financial market liberalisation may have led to an increase in the equilibrium real interest rate, while Summers (1996b) contends that if widespread fiscal consolidation occurs, this will lead to a reduction in such real rates. For accounts of the many factors determining equilibrium real interest rates, see, for example, Blanchard and Summers (1984) and Barro and Sala-i-Martin (1990).

³⁸ The direct link between money and spending is associated with the well-known real balance effect (see, for example, Patinkin, 1987), while the direct credit effect is well summarised by Gertler and Gilchrist (1993) and Kashyap and Stein (1994).

possibility of indexing to overcome some of the problems caused by inflation. Friedman (1974), Fischer (1993) and Aiyagari (1990) argue that the tax system should be fully indexed to deal with its interaction with inflation. Feldstein (1996) counters such suggestions by arguing that although there is a long history of proposals to index the tax system, most taxation systems remain unindexed. He suggests that this is due to various legal and administrative difficulties involved in indexing. He also makes the point that if indexing leads to less public support for anti-inflationary policies, this may result in a higher inflation outcome and a lower level of overall welfare⁴⁰. Friedman (1974) and Fischer (1993) also argue that the issuance of inflation-indexed government bonds would bring welfare gains. This seems likely to be true given that such indexation increases the range of investment instruments which are available, in addition to reducing the attractiveness of inflationary policies to governments. As long as the majority of bonds remained unindexed this should not serve to remove the counterinflationary influence of the bond market. The indexation of wages can, however, lead to problems of inflexibility and to a toleration of inflation, as was tellingly demonstrated by the adverse impact of the *scala mobile* in Italy⁴¹ until its recent abandonment. Finally, the indexation of general private contracts and accounting techniques, although perhaps desirable, is very difficult to envisage being introduced on a wide scale in practice.

Overall, the incentives for the introduction of widespread indexation were far greater in the inflationary environment of the 1970s. Given the lack of action on indexation in such circumstances, it seems unlikely that any moves on this front will be forthcoming in the current low inflation environment.

In summary, the desirability of indexing in order to deal with ongoing inflation is a very contentious issue. Although it may bring benefits in certain areas, it has also been challenged on the basis that it is impractical, unlikely to be enacted, and could lead to public attitudes that are more benign towards inflation, thus perhaps having adverse effects on welfare. One thing is clear, however: If the costs of inflation outweigh the

³⁹ See, for example, Mishkin (1995) and Brunner and Meltzer (1993).

⁴⁰ See, for example, Fischer and Summers (1989), for a model which generates such an outcome.

⁴¹ The *scala mobile* automatically indexed wage payments in Italy.

putative benefits, then the first best solution is to eliminate inflation and not to deal, in a second-best manner, with an unwarranted inflation through indexation.

5. Summary and Conclusions

Since the 1970s, inflation rates in most industrialised countries have fallen dramatically. As a result a new debate has emerged among economists and policymakers alike: Should monetary authorities be content to let inflation settle at its current low levels, or, alternatively, should they attempt to move towards a position of price stability? This paper devotes its attention to this important topic.

Those who argue in favour of price stability base their recommendations on the many costs which are associated with inflation (see Table 1). Although some of these costs decline to negligible levels at the low inflation rates currently being observed, some studies, such as Feldstein (1996), Black, Macklem and Poloz (1993), Ball and Romer (1993) and Dotsey and Ireland (1996) find evidence in support of significant adverse welfare costs at low inflation rates. Interestingly, the two main general equilibrium approaches used thus far in analysing the costs of inflation (i.e. Black, Macklem and Poloz, 1993, and Dotsey and Ireland, 1996) uncover very large adverse welfare effects associated with even moderate inflation rates. This suggests that the partial equilibrium approach usually employed may understate the true costs of inflation.

The significant costs associated with the low inflation rates currently prevailing do not necessarily provide one with a convincing argument in favour of price stability, however. The reason is that there are costs associated with moving to a situation of stable prices. It was, however, tellingly demonstrated in the paper, that even if there were very large (but, nevertheless, temporary) costs associated with disinflation (which does not appear to be the case based on the available empirical evidence), these should be swamped by the welfare gains associated with price stability, because such gains are permanent. Unless the sacrifice ratio explodes as we move towards zero inflation, this argument should continue to hold.

There have, however, been a variety of arguments put forward recently, that there may in fact be permanent costs associated with a policy devoted to price stability and that

these may outweigh the putative benefits of such a policy. Such a charge, if warranted, would represent a much more serious challenge to the desirability of price stability than the conventional transitional costs argument. These arguments take three forms.

First, there is the argument that not only may there be temporary costs associated with transition to price stability, as the conventional sacrifice ratio literature argues, but that costs of a permanent nature may arise. Ball (1996) argues that the various disinflations of the 1980s were largely responsible for the recorded increase in the NAIRUs in OECD countries. It is fair to say, however, that this view is highly controversial, and that a wide variety of other factors have been put forward by various authors for the observed increases in the natural unemployment rates.

Second, there is Tobin's (1972) argument, recently elaborated in Akerlof, Dickens and Perry (1996) that price stability will lead to an increase in the natural rate of unemployment, given that inflation allegedly greases the wheels of the labour market by allowing real wages to fall, even when nominal wages are downwardly rigid. Many counterarguments have been levelled against this proposition, and these were outlined in the previous section. Perhaps the most damning argument which can be made against this proposition, however, is the fact that it relies upon continued money illusion and involves deliberately distorting the unit of account upwards in order to engineer lower sustainable unemployment rates. As Fischer (1996) argues, "money illusion is after all an illusion, one that is likely to yield eventually to the weight of facts" (p. 11).

The final main argument against price stability is predicated upon the so-called Summers effect. This centres on the possibility that monetary policy may not be as effective under a regime of price stability, as it is impossible to generate negative real interest rates in such an environment. It has been argued, however, that negative real interest rates may not be needed in practice, and that occurrences of such rates in the past have sometimes been problematic rather than helpful (the negative real rates of the 1970s being a case in point). Others have argued that monetary policy can retain its effectiveness even when negative real rates cannot be engineered given the many direct links between money and demand and, in addition, monetary policy's effects through a

wide variety of asset prices. Finally, exchange rate and fiscal policy could also be used as substitutes if the need arose.

Overall, it can be seen that although there appears, on the basis of the literature reviewed, to be a good case for moving towards price stability, this remains a highly controversial area of debate. Perhaps it would be better to allow the debate to move on further before committing to a policy of price stability which may not be optimal. We are, accordingly, forced to conclude our paper in the same manner as a number of other commentators in this area, viz. it is simply not possible, given the stage at which the current debate is at, to arrive at a definite value for the optimal rate of inflation. The debate thus far appears to lean towards the desirability of a price stability objective. However, in Scottish legal parlance, it is fair to say that the case remains *not proven*.

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