

## **Fears of Deflation Then and Now\***

Richard C.K. Burdekin  
Department of Economics  
Claremont McKenna College  
500 E. Ninth Street  
Claremont, CA 91711

Pierre L. Siklos  
Department of Economics  
75 University Avenue  
Wilfrid Laurier University  
Waterloo, ON  
CANADA  
N2L 3C5

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Richard C.K. Burdekin  
Claremont McKenna College  
e-mail: [rburdekin@mckenna.edu](mailto:rburdekin@mckenna.edu)

Pierre L. Siklos  
Wilfrid Laurier University  
e-mail: [psiklos@wlu.ca](mailto:psiklos@wlu.ca)  
Home Page: [www.wlu.ca/~wwwsbe/faculty/psiklos/home.htm](http://www.wlu.ca/~wwwsbe/faculty/psiklos/home.htm)

## Summary

Surveys of the kind conducted by Shiller (1997) have confirmed the view that the public understands the costs of inflation, even if neither the public nor policy makers can agree on a definition of price stability. However, there is relatively little understanding of the consequences of deflation. In part this is due to the fact that episodes of sustained falls in consumer prices have been rare since the 1930s. In addition, until recently perhaps, it has also been implicitly assumed that, in the case of asset prices, there is a significant asymmetry between rising and falling asset prices. The dichotomy between consumer and asset prices on the one hand, and the belief that there are only negative consequences from deflation on the other, is neither well understood nor has the issue been adequately analyzed. During the Great Depression both goods and asset prices fell and the economy slumped. Although this experience does not characterize the entire history of deflationary episodes (BIS 1999, 78-80), Sylla (1991) suggests that nineteenth century US evidence does offer further examples of widespread speculative excesses apparently triggering a cycle of boom and bust that produced not only financial disturbances (or “panics”) but full-blown economic depression. Moreover, Sylla (1991, p. 10) argues that, while depressions did not follow all such financial disturbances, in each case where this *did* happen “speculation took place on a number of fronts simultaneously and ... at least some of these fronts were unlikely to have panned out financially even if financial disturbance and depression had not ensued.”

The premise that deflation, especially in consumer prices, is very costly for the economy as a whole itself has a long history in the economics profession. Keynes (1923), for example, argued strongly that deflation is worse than inflation (also see Laidler 1999, p. 109; Meltzer 1988, p. 47). Policymakers also seem to have shared this view. In an interview shortly before taking office, the Governor of the Bank of Canada, David Dodge, stated: “I think the costs of going down to [zero inflation] are high, and there are real asymmetries when you get into price deflation. We haven’t got much evidence that things work a lot better at zero than they do at one or two” (Thorsell, 2001). John Taylor, reflecting on the recent Japanese experience with deflation, echoes the Governor’s thinking by stating that: “I get worried about deflation and that is another reason to have an inflation target” (Snowdon and Vane 1999, p. 201). Contrasting this position is the view expressed by the Governor of Japan, for example, that in a low inflation environment with productivity gains, deflation is possible and a monetary policy that sets out to aggressively counter such price declines might be counterproductive. Indeed, Hayami (2001) states that “at a time when prices decline on account of

productivity gains based on rapid technological innovation, a forceful reduction in interest rates with a view to raising prices may amplify economic swings.”

In this paper, we explore public and policy maker perceptions and reactions to deflations. We analyze the views of economists and the financial press, primarily in North America and the United Kingdom, at the time of the deflation in the second half of the 19<sup>th</sup> and the first thirty years of the 20<sup>th</sup> century. During these episodes both consumer and asset prices fell. We compare these experiences to the recent case of deflations in both asset prices and consumer prices in China and Japan. We rely on econometric and descriptive evidence throughout.

We conclude that there is some similarity between the sequence of events observed in China and Japan in the 1990s and those of the United States following the Wall Street Crash of 1929. In each case large asset price declines accompanied by monetary contraction are later followed by outright deflation and falling goods prices. While the limited data available on the Chinese and Japanese experiences are insufficient to establish a demonstrable causal link between asset prices and consumer prices, a more consistent predictive role for asset prices – particularly housing prices – has been suggested by Goodhart and Hoffman (2000). The question of whether asset prices should actually be targeted in central bank policymaking remains highly controversial but has recently received increasing attention in the literature (see, for example, Kennedy et al., 1998; Bernanke and Gertler, 1999; Filardo, 2000; Vickers, 2000; Bryan, Cecchetti and O’Sullivan, 2001; and Goodfriend, 2001).

One of our objectives is to address the question of whether today’s fears of deflation are well-founded, both in relation to what is known from economic analysis as well as from the reactions of the public and policy makers. Another key issue is the effectiveness of, and rationale for, policy initiatives aimed at combating deflation and whether these initiatives should take into account the movements in asset prices.

Prior to World War II, a review of the academic and business press clearly reveals that concern over the consequences of deflation focused almost entirely on commodity prices, and agricultural prices in particular. By contrast, the focus of the recent alarm over the possibility of deflation centers around the behavior of asset prices, especially financial asset prices. In a sense this is not surprising since a striking difference between pre WWII and post-war economies stems from the relatively small fraction of the labor force in non-agricultural pursuits and the tremendous growth in financial sophistication, especially in the industrial world. Bordo and Jonung (1987; also see Siklos (1993) and Bordo, Jonung and Siklos (1997)) document these features of economic history in five countries (Canada, Sweden, the UK, the US, and Norway).

However, there is also nowadays a more general concern over the potential of deflation in an index of overall prices due to the widespread adoption of inflation objectives, either of the implicit or explicit varieties. Nor are worries about the behavior of commodity prices entirely a relic of the past. The BIS (1999, Graph IV.9) claims that inflation targeting countries are characterized by a relatively large fraction of exports to GDP. In addition, of course, these same countries are also small open economies that can conceivably suffer the twin shocks of lower commodity prices and a falling exchange rate. <sup>1</sup> The latter can conceivably be inflationary, at least in the short-run, and may lead to an interest rate response in order to prevent inflation from failing to meet stipulated objectives. The former, if it feeds into the rest of the economy, can possibly lead to a “deflationary spiral”. Therein lies the importance placed on the symmetric response to deviations in inflation from some central objective. If, instead, consumer prices continue to rise, then commodity and consumer prices will diverge. This is, in essence, a modern manifestation of the “scissors” problem familiar to policy makers in the early part of the century. The problem originally referred to the divergence between agricultural and industrial prices and the overall impact this distortion is said to have had on the flow of resources from one sector of the economy to the other. Of course, as commodity-based industries have fallen considerably in importance, the closing of the “scissors” is no longer as great a policy issue as it once was. Nevertheless, the divergence between overall prices and financial asset prices raises similar questions with potentially important consequences.

In reviewing how thinking about the consequences of deflation has evolved over time it is important to keep in mind that, whereas reactions in the 1990s are usually framed within some “model” of the economy, the pre-1940s discussion tends to be descriptive and not analytical. A significant reason, as explained by Morgan (1990), and

Woodford (1999), is that macroeconomics as a discipline was still in its infancy, while statistical tools and the necessary data to uncover the determinants of business cycle fluctuations were only being developed or introduced by the 1920s.

Theories of the business cycle were narrative and only the simplest of interactions between markets were considered. Yet, these views, while largely accurate, are surely over-simplifications in the sense that there were attempts to achieve a consensus of sorts about the desirability of price stability, although in the context of a “model” where business cycles were thought to be more or less inevitable. Bellerby (1924), for example, goes so far as to argue for an inflation target of 3% growth in the price level, although not calling it as such, together with exemptions “in cases of real emergency”. However, the proposal “would allow the continuance of either prosperity or slight depression over long periods of time” (op.cit., p. 178). Keynes (1925) also advocated a ‘managed currency’ in terms of commodity prices, to reduce instability in trade and mitigate its impact on employment, in a scathing review of a report on the Bank of England. But it was to no avail as his views, and those of other advocates of some form of price level or inflation targeting, fell on deaf ears among policy makers and many academics blinded by the ideology of the Gold Standard (see Eichengreen 1992). The experience of the Great Depression further reinforced the desirability of price stability not so much to prevent deflation at all costs but to reduce the variability in prices. “As to the larger conclusion, we know this: Periods of serious price disturbances are periods of industrial and financial disturbance and social unrest. Practically never one without the other. And periods of price stability are periods of industrial and social equilibrium and sanity.” (Snyder 1935, p. 202). It would take the economics profession over 60 years to work out formally the notion that inflation targeting, while desirable, must confront the trade-off between the variability of inflation and output. Nevertheless, the concern over these issues is not new.

Then there is the question of expectations. Thus, while expectations play a role in descriptions of the process of deflation (and inflation) they are viewed as being more or less exogenous, if not almost deterministically driven so that depression and deflation could become self-fulfilling prophecies. “The continuous expectation of a further fall in prices has had a very restricting influence on the buying power of the general public. The steady reduction in prices has made it impossible in a great many cases to pay back money borrowed at a time when prices were higher.... Further, restriction of credit have followed, with the result that prices have been forced down still more...” (New York Times, November 27, 1921, page 8, col. 1)

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<sup>1</sup> Recall that a proper inflation targeting regime requires a floating exchange rate regime.

There were also doubts expressed about the efficacy of monetary policy, other than perhaps in the short-run, but these had to confront the lack of hard evidence about the connection between falling prices and the real economy. These considerations make the common view that rising prices brought about by monetary causes are beneficial to production at least doubtful. It is still true that ‘One wants very much stronger statistical evidence than one yet has to prove that a fall in prices diminishes perceptibly, and in the long run, the total productiveness of industry’ ” (Pigou 1923; the quote is by Alfred Marshall from the report of the Gold and Silver Commission).

In what follows we present some stylized facts for the US alone. In a future version of the paper we plan to add evidence from the UK, Canada, Sweden and Australia. Since deflation, as defined above, is a feature of the economic experience of the pre World War II era, data limitations preclude useful statistical testing beyond the annual frequency, especially for a cross-section of countries that we wish to emphasize.

One way of thinking about the consequences of deflation versus inflation is to examine their persistence properties. Burdekin and Siklos (1999) find, using a data set similar to the one being used here, that an AR(1) model of inflation, augmented with other variables (see below), adequately explains the evolution of inflation over long periods of time. We find that inflation is easier to predict, based on past history, than deflation, and this may be one reason for the unease with policies or events that lead to falling prices. If deflation is more difficult to forecast then unexpected movements are more likely. Overall, an AR(1) model with a memory of deflation only does a better job over the two centuries of inflation and deflation than the model that has a memory of inflation alone. An AR(1) model, while useful as a descriptive device, is hardly a complete model of inflation. Moreover, there are potentially many determinants of deflation and inflation. For example, a list of such additional determinants might include the following: stock prices, wholesale prices, NBER reference cycle dates, the term spread, a proxy for financial innovations, and the default spread. Wholesale price inflation proves to be the most reliable predictor in CPI inflation, followed by NBER recession dates, the terms spread, the proxy for financial innovation, the default spread, and, finally, stock prices. It is usually the case that inflation is better forecasted when default risk is a determinant of inflation than when financial innovations enter into the picture.

To date, however, we have not made use of the possible asymmetry between episodes of inflation or deflation. Shiller (1997), for example, reports that there is a substantial difference between the type of “model” used by wage and price setters and the models economists are fond of estimating via econometric techniques. Indeed, Kanheman

and Tversky (1979) argue that “editing” of information is commonplace. A related literature might be the one that deals with problems of “bounded rationality”. We also consider a variety of estimates based on Tobit models of the inflation process. We continue to find that deflation is more difficult to explain than is inflation, as evidenced by the considerably lower explanatory power of the relevant regressions.

Criticisms of this approach to consider in future work includes asking whether individuals actually “censor” some of the data when estimating a model of inflation or deflation, as well as whether it is appropriate or not to censor the CPI series but not the wholesale price data. Nevertheless, there are some interesting additional observations that can be made about some of the results we have found so far. First, censoring inflation, which, as noted above, is a likely scenario given the history of price movements in the United States, implies, for example, that the Great Depression could not have been anticipated, despite the deflation of the 1920s. Second, even if agents use all available information, they will consistently underestimate the *severity* of sharp inflations or deflations. Finally, a model that is based solely on, shall we say, “fears” of deflation may end up predicting that the deflation will end up becoming uncontrollable.

A critical element in the foregoing analysis is that inflation forecasts are based on purely backward-looking models. Fuhrer (1997) argues that the behavior of actual US inflation is best described using a mix of backward and forward looking features. In contrast, a purely forward looking model is found to be severely at odds with the data. He also notes that his conclusions, not surprisingly, may be model specific.

Accordingly, we also estimate a version of our baseline model that mixes forward-looking and backward looking behavior along the lines suggested in Fuhrer (1997). It is rather clear from our estimates that both forward and backward-looking elements help explain the inflation process since 1876. We also find that backward looking elements explain the process relatively better when inflation is low and stable, as in the 1960s, while forward looking elements rise when there are sharp changes in actual inflation as, for example, in the presence of the two oil price shocks of the 1970s. It also appears to be the case that both forward and backward-looking elements in inflation are rather unhelpful in forecasting deflation, as is readily apparent for the most part during the 1895-1920 period. The results are consistent with those of Chadha, Masson, and Meredith (1992) but our findings but stand in contrast with Fuhrer’s (1997) evidence that reports far higher estimates of the degree to which there is a forward-looking element in inflationary expectations.

As noted earlier, fears of deflation are perhaps best interpreted in light of the trade-off between the variability of inflation and output. Based on that framework, we

immediately see the desirability of inflation targeting certainly versus the Gold Standard (the differences are magnified when measured in terms of variances), and even a slight preference over the Bretton Woods era. While there are considerable differences in output performance as between wars, the Great Depression, inflation variability is comparable. Clearly, the decades of the 1930s and 1940s stand out both as highly volatile in output though not necessarily in terms of inflation. Even if inflation volatility may have been lower during some of the earlier decades of the 20<sup>th</sup> century or the late 19<sup>th</sup> century, output volatility is relatively lower in every decade since World War II.

We have, so far, concentrated on the behavior of consumer and commodity prices. Not to be forgotten is the role of financial asset prices, their connection to economic activity in general as well as their role in stoking fears of deflation. We intend to explore these connections in an upcoming version of this paper.