

Comment on Charles Wyplosz,  
“Do We Know How Low Inflation Should Be?”\*

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Charles Wyplosz [13] has produced a very interesting and challenging paper on a very important topic. It is about the relation between equilibrium unemployment and long-term inflation, whether inflation brings “grease” (lower unemployment) or “sand” (higher unemployment). It is about the slope of the long-run Phillips curve; whether it is vertical or not. This has implications for the choice of the operational definition of price stability and the level of an inflation target.

Charles’s approach is to estimate Phillips curves for Germany, France, Italy, the Netherlands and Switzerland, and then to infer a polynomial representation of the long-run Phillips curve. His main results are displayed in his figure 3. He finds that the long-run Phillips curves are nonlinear and not vertical. He, quite surprisingly, finds a sand effect at low levels of inflation. For Germany, he finds a grease effect at a higher inflation, in the range of 4–10% (at an annual rate) .

As we know, Charles is a great academic scholar, and he is careful to emphasize, with admirable honesty, a number of caveats and weaknesses of his results. For instance, the confidence intervals are wide, and the estimated long-run Phillips curve is barely significantly different from a traditional vertical long-run Phillips curve. Furthermore, he explicitly shows that the Phillips-curve estimates are very problematic. (Also, the results for the UK that were presented at the conference were highly implausible.) As a consequence, his results displayed in figure 3 must be deemed to be very unreliable. It is much too early to take them seriously and, as often, more research is required before we can give any weight to the findings.

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\*A revised version of comments presented to the First ECB Central Banking Conference, *Why Price Stability?*, Frankfurt, November 2–3, 2000.

Incidentally, if the results and these curves are taken seriously, it is apparent from the figure that zero inflation is a good inflation target for France and Germany.

One potential source of problems is Charles's main measure of inflation expectations. He takes inflation expectations to be given by the yield curve, more precisely as the difference between a long bond rate and a measure of the world real interest rate. Furthermore, his measure of inflation expectations is quite important for his approach to estimate long-run Phillips curves; indeed, his long-term inflation is defined as a moving average of the measure of inflation expectations.

Obviously, there are other alternatives for estimating inflation expectations. Some sensitivity analysis is warranted, on how the results depend on alternative measures and estimates of inflation expectations. One alternative measure of inflation expectation, based on the European Commission's and the OECD's forecasts, is incorporated in the revised version of the paper. Figure 5 reveals that the results are quite sensitive to the measure of inflation expectations used.

As another possible alternative, let me mention the approach used in the paper by Stefan Gerlach and myself, [4]. The focus in that paper is on the role of monetary indicators in the Euro area. In examining the role of monetary indicators, we estimate various Phillips curves, using synthetic Euro-area data. With regard to inflation expectations, we assume that they depend on a Euro-area "inflation objective", denoted  $\hat{\pi}_t$ , and lagged inflation,  $\pi_{t-1}$ . The inflation objective is assumed to reflect the average ERM central-bank commitment to reduce inflation to the German level, and it is assumed to gradually converge to Bundesbank's "inflation target" (what, over time, was called "unavoidable inflation," "normative inflation" and "medium-term price assumption"). With these inflation expectations, our Phillips curves fit very well. This is illustrated in table 1 of Gerlach and Svensson [4], reproduced below. Column (4) shows a regression of the inflation deviation from the inflation objective,  $\pi_{t+1} - \hat{\pi}_{t+1}$ , on lagged inflation deviations,  $\pi_t - \hat{\pi}_t$ , the output gap,  $y_t - y_t^*$ , and lags of oil-price inflation. We see that the output gap is highly significant, with a sizeable coefficient, and that the adjusted R-squared is substantiable.

Clearly, in this equation, the dependent variable is the output gap, not the unemployment gap, as in Charles's equations. Furthermore, the data is aggregate synthetic Euro-area data, not actual national data. Still, the good fit suggests that it may be a good idea to run Charles's equations for a number of alternative assumptions on expectations formation.

It is, of course, impossible do discuss the issues of unemployment, wage formation, and inflation without reference to the, by now, classic paper by Akerlof, Dickens and Perry (ADP) [1]. The ADP paper provides evidence of downward nominal rigidity and argues that low inflation implies higher unemployment.

Table 1. Inflation, 1981:4–1998:4, Dependent variable:  $\pi_{t+1} - \hat{\pi}_{t+1}$

Equation	(1)	(2)	(3)	(4)	(5)	(6)
Estimation	OLS	SURE	OLS	OLS	OLS	OLS
$\pi_t - \hat{\pi}_t$	.354** (.095)	.385** (.089)	.351** (.098)	.437** (.103)	.464** (.103)	.390** (.103)
$\tilde{m}_t - \tilde{m}_t^*$	.284** (.057)	.281** (.054)	.285** (.092)	–	–	–
$y_t - y_t^*$	–	–	.028 (.087)	.219** (.075)	–	.188* (.075)
$\Delta_4 m_t - \Delta_4 m_t^*$	–	–	–.031 (.099)	–	.207* (.084)	.162* (.083)
$\Delta q_{t+1}$	.223** (.066)	.242** (.062)	.233** (.067)	.271** (.072)	.246** (.075)	.251** (.072)
$\Delta q_t$	.002 (.073)	–.011 (.068)	.003 (.074)	–.012 (.081)	–.016 (.082)	.000 (.079)
$\Delta q_{t-1}$	–.199** (.068)	–.205** (.064)	–.197** (.069)	–.203** (.075)	–.218** (.077)	–.206** (.074)
$\Delta q_{t-2}$	.283** (.057)	.264** (.053)	.277** (.059)	.232** (.063)	.275** (.065)	.260** (.063)
$\bar{R}^2$	.71	.71	.70	.65	.63	.66
SEE	.72	.72	.73	.80	.81	.78
DW	2.20	2.28	2.19	2.20	2.20	2.20

Given the way the ADP paper is written, many readers interpret it as a warning against inflation targets below 3%, on the ground that lower inflation targets would increase unemployment permanently. However, even if the ADP results are taken at face value, that fact is that they imply that an inflation target of 2% is quite all right, since there is hardly any increase in unemployment at that level of the target (see their figure 3.).

Furthermore, I believe that the ADP results have generally been oversold and should not be taken at face value. Indeed, I think no reader should form an opinion about the ADP paper before reading Gordon’s [5] very sceptic and, in my mind, quite appropriate comment. For instance, the paper relies on data with inflation higher than 2–3%. Furthermore, the ADP

analysis disregards that wage-setting behavior may change with a transparent and credible low-inflation policy. Ironically, since the paper was published, US inflation and unemployment have both reached record lows, very much counter to the ADP prediction.

As emphasized in José Viñals paper to this conference [10], there is evidence that European wage behavior is different from that in the US. Work by Layard, Nickell and Jackman [7] and Viñals and Jimeno [11] provide evidence that Europe is characterized by more real-wage rigidity and less nominal rigidity than in the US. An extensive survey by Yates [12] finds no support for the ADP results for Europe.

Interestingly, the new ADP paper, [2], is very different. There the authors find grease at low positive inflation. However, as emphasized in the comment by Blinder [3], this result relies on workers having permanent monetary illusion and a sizeable proportion of the population being indefinitely fooled by a small positive inflation cutting into their real wages. I remain very sceptical about this result. In addition, I believe one objective of a transparent monetary policy is to help people avoid monetary illusion and instead make informed decisions and this way improve the resource allocation.

What levels of inflation targets have some representative central banks in industrialized countries chosen? In New Zealand, the Reserve Bank of New Zealand has a target range of 1–3%, and hence a midpoint target of 1.5%. In the Euro area, we have the embarrassing situation that the announced definition of price stability is somewhat ambiguous and asymmetric (see, for instance, Svensson [8] and [9]). The target range is from either 0 or some small positive number to 2%, which leaves the midpoint ambiguous. Working backwards from the construction of the M3 reference value, one gets to a point inflation target of 1.5%, the same level as in New Zealand (which however seems to be higher than the midpoint of the Eurosystem’s target range, unless the target range is as narrow as 1–2%). In Switzerland, the Swiss National Bank abandoned monetary targeting in December 1999 and adopted the Eurosystem definition of price stability (although without the much criticized two-pillar strategy; instead relying on an inflation forecast to guide policy). In Canada and Sweden, Bank of Canada and Sveriges Riksbank have a point target of 2% with a tolerance interval of  $\pm 1\%$ . In the UK, Bank of England has a point inflation target of 2.5%, and in Australia there is an inflation target over the business cycle that can arguably be interpreted as a 2.5% point target.

Thus, these point targets or midpoints range from 1.5% to 2.5%. I believe that there is no reason to believe that wage formation in Europe would provide difficulties for inflation targets

in that range.

First, a bit of productivity growth does wonders. Suppose the inflation target and average inflation is 2%, and suppose that productivity growth is also 2%, not an unrealistic number. This means that average wages can rise at a rate of 4%. But then, one wage can be constant at 0% and another can rise at a rate of 8%, with the average still at a rate of 4%. This means that an inflation target and productivity growth at these levels still allow for substantial relative wage flexibility.

Second, even if there would be downward nominal wage rigidity, a low-inflation environment provides strong incentives to get around this restriction, for the benefit of both workers and firms. For instance, there are strong incentives in favor of flexible bonus and profit-sharing systems. If there is a bonus, which is positive on average but shrinks to zero during bad times, some effective nominal wage flexibility has been introduced.

Third, a credible low-inflation policy means that inflation expectations are anchored on the inflation target. If the inflation target is credible among the labor market parties, this implies that a natural starting point for wage negotiations is the inflation target plus the productivity increase. Here, a symmetric point target has great advantages over a somewhat ambiguous target range. With a symmetric point inflation target, it is natural that this number becomes one of the agreed inputs in the wage negotiations. In contrast, with an ambiguous range or an ambiguous midpoint, the starting point may vary by several tenths of a percent, which is not innocuous since the wage settlements often concern a few tenths of a percent.

A clear and transparent monetary policy should help the labor-market parties understand the rules of the game under a low-inflation monetary policy. It is instructive to see how this is done under inflation-forecast targeting. Suppose that inflation-forecast targeting is implemented so that the central bank's instrument rate is set so that a 2-year-ahead inflation forecast is close to the inflation target. Let the inflation forecast depend on the instrument rate and nominal wage levels, and hold for simplicity other inputs in the forecast constant. If wage negotiations result in increases in nominal wages, everything else equal, this will raise the 2-year-ahead inflation forecast above the inflation target. Consequently, the central bank has to raise the instrument rate so as to contract the economy, reduce employment, and bring the inflation forecast down towards the target.

Since the central bank thus maintains low inflation (and a forecast of low inflation), from the point of view of trade unions, nominal wage increases lead to real wage increases, which lead to

higher unemployment. Thus, trade unions are forced to internalize the effect on unemployment of their wage demands, and there are strong incentives to adapt wage demands to the inflation target.

Explaining the above and convincing the trade unions to internalize the effect on unemployment of their wage demands is an important part of a transparent monetary policy. The Swedish experience during the last few years is quite instructive. By a consistent conduct and presentation of its policy, the Riksbank has achieved almost perfect credibility of the 2% inflation target, with inflation expectations a few years ahead anchored almost exactly on 2% (see chart 1 in Lars Heikensten's comment [6] on José Viñal's paper [10]). Furthermore, trade-union officials now seem to understand and accept the inflation-targeting regime, and indeed seem to internalize the effect of wage demands on unemployment. Indeed, Lars Heikensten, First Deputy Governor of the Riksbank, can tell you how he has many times during recent years personally met trade-union officials to gather support for new regime and to explain how inflation targeting works and what the new rules of the game are. In full consistency with this, unemployment in Sweden has come down rapidly the last few years, while inflation has remained low.

In conclusion, I find no evidence that wage formation in Europe provides a case against a symmetric point inflation target as low as 2% or even 1.5%.

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