

# Comment on “Inflation and activity” by Olivier Blanchard, Eugenio Cerutti and Lawrence Summers

By Laurence Ball<sup>60</sup>

This paper reports two important findings. First, recessions in advanced economies are typically followed by persistently low levels of output relative to pre-recession trends, or even lower growth rates of output. One reason for this finding, the authors suggest, is hysteresis: recessions cause long-term damage to economies.

Second, Phillips curves in advanced economies flattened between the 1970s and early 1990s, but their slopes have been stable since then. Today, in a typical country, a one-percentage-point rise in unemployment reduces inflation by about one-quarter or half of a percentage point.

Regrettably, from the point of view of writing an entertaining discussion, I find the authors’ analysis sensible and mostly agree with their conclusions. I will nevertheless highlight some key evidence and discuss policy implications, which are profound.<sup>61</sup>

## 1 Long-term damage from recessions

The authors examine how recessions affect the economy in the medium run – three to seven years after the recessions end. They find that output over this period is below the pre-recession trend in 66% to 73% of episodes, depending on how the trend is estimated. Averaging across all episodes, a recession reduces medium-run output by about 5%. In 30% to 34% of cases, the post-recession output loss rises significantly over time.

This finding probably reflects several phenomena. An adverse supply shock may trigger a recession and also reduce long-run output. Anticipation of a growth slowdown may cause a recession by reducing current consumption and investment. Or a recession may leave long-term scars on the economy.

This last possibility – the hysteresis hypothesis – is a major challenge to the macroeconomic models that appear in textbooks, and that guide policy-making at central banks. In those models, the long-term path of output and short-run fluctuations are determined by different factors. The effects of a recession disappear within a few years.

I agree with the authors that the cleanest test for hysteresis is to examine recessions caused by intentional disinflations. These shifts in monetary policy are demand shocks that should not have persistent effects on output, according to conventional models.

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<sup>61</sup> At the conference where the paper was presented, the authors and I disagreed strongly about the part on the Phillips curve. However, we have since had a meeting of minds.

Of the 122 recessions examined by the authors, they attribute 28 to intentional disinflations. Between 57% and 71% of those recessions caused persistent output losses, and the average effect on medium-run output is 3% or 4%. This effect is slightly smaller than the 5% average for all recessions, but still substantial. I think these findings are important evidence for hysteresis.<sup>62</sup>

Only 18% to 21% of the disinflations lead to output losses that grow over time. I find this low figure reassuring because, as the paper points out, growth-rate effects of demand shocks are an extreme form of hysteresis that may not be plausible. I would like to take the paper as finding that demand shocks often reduce output levels, but usually not growth rates.

A critical question is why many disinflations (57% to 71%) reduce output permanently, but some (29% to 43%) do not. I believe a key factor is what policy-makers do after the initial tightening that reduces output and inflation. In some episodes, such as the Volcker disinflation in the United States, policy quickly shifts toward expansion, pushing output back to its pre-recession path (the “morning in America” celebrated by Ronald Reagan). In other episodes, such as the Thatcher disinflation in the United Kingdom, policy stays tight for longer and that causes permanent output losses (Ball (1999)).

I tried to test this idea with the data from this paper, but I ran into a problem. The authors estimate pre-recession output trends with several different methods, and they are agnostic about which method is best. They emphasise that their results about the average effects of recessions are robust. Unfortunately, the estimated trends make a big difference for the costs of individual recessions. For recessions caused by disinflation, the correlation of medium-run output gaps with trends based on four-year and ten-year windows (not adjusted for credit booms) is only 0.44. With a four-year window, the largest gap is 29% for the recession in Portugal, 1992-93; with a ten-year window, the gap for that episode is -8%. With a four-year window, the gaps are 12% for the Volcker disinflation and -23% for the Thatcher disinflation; with a ten-year window, the gaps for both of those episodes are close to zero.

Since it is unclear which recessions have the largest costs, it is hard to identify factors that determine the costs. To make progress on this issue, we need an accurate method for estimating pre-recession trends. Developing such a method is a challenge for future research.

Let's turn to policy. If hysteresis effects are significant, that fact has a simple but vitally important implication: **A central bank should not have a single mandate for price stability.**

The case for a single mandate rests on the theory that monetary policy affects only nominal variables in the long run. Hysteresis means that policy has long-run effects on employment and output, so a central bank may succeed at producing price stability but also cause economic stagnation. Policy-makers should have a dual mandate that reflects their influence on the real economy.

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<sup>62</sup> I computed average effects of the 28 disinflations from the data in the paper's web appendix.

The danger of a single mandate is illustrated by Jean-Claude Trichet's remarkable statement at a press conference in 2011. Challenged to defend ECB policy, Trichet said:

"We were called on by all the democracies of Europe to deliver price stability ... We have delivered price stability over the first 12-13 years of the euro! Impeccably! I would like very much to hear some congratulations ... "

In 2011 the unemployment rate in the euro area was over 10%. Unemployment was 15% in Ireland, 18% in Greece and 21% in Spain. The ECB needs a dual mandate so no policy-maker can expect congratulations in these circumstances.

## 2 The Phillips curve

The paper reports two findings about changes over time in the Phillips curves of advanced economies. First, short-run inflation expectations have become more anchored, in the sense that inflation depends more on long-term expectations ( $\pi^e_t$ ) and less on actual inflation rates in the recent past. Most of this shift occurred between the mid-1980s and mid-1990s (Chart 7 in the paper).

The terminology here is potentially confusing. Other researchers use the term "anchoring" for a different phenomenon: long-term expectations,  $\pi^e_t$ , have become less responsive to actual inflation, and stayed near the 2% targets of central banks. This change has occurred since the late 1990s. The two types of anchoring, while distinct, have complementary effects: both reduce the persistence of shocks to inflation.<sup>63</sup>

Second, Phillips curves became flatter – the effects of unemployment on inflation fell – from the 1970s to the early 1990s. Since the 1990s, however, Phillips-curve slopes have been roughly constant. In a typical country, a one-percentage-point rise in unemployment reduces inflation by one-quarter or half a point.

These results differ significantly from the past International Monetary Fund (IMF) research on which the paper builds (WEO (2013)). That work found that the Phillips curve has flattened since 2000 and attributed the change to the interaction of low inflation and downward nominal wage rigidity. The current finding of constant slopes since the 1990s, when inflation was higher in most countries, suggests that downward wage rigidity has *not* had important effects on the Phillips curve.

The earlier research in the WEO posited a Phillips curve with four unobservable, time-varying parameters. As Blanchard et al. discuss, they changed their mind about the slope of the curve after simplifying the WEO specification. Their paper reminds us that parsimonious specifications can be vital for credible empirical work.

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<sup>63</sup> To make this point more formally – the paper's Phillips curve includes a weighted average of long-term expectations and past inflation:  $\lambda\pi^e_t + (1-\lambda)\pi_{t-1}$ . Suppose  $\pi^e_t = \omega\pi^* + (1-\omega)\pi_{t-1}$ , where  $\pi^*$  is the central bank's inflation target. Combining these expressions, a reduced-form Phillips curve includes  $\lambda\omega\pi^* + (1-\lambda\omega)\pi_{t-1}$ . The current paper finds that  $\lambda$  has risen, and previous work finds that  $\omega$  has risen. Both of these changes have reduced  $1-\lambda\omega$ , the effect of past inflation on current inflation.

For even greater transparency, I modify Blanchard et al.'s analysis in several ways. First, I aggregate the euro area into one economy and study its Phillips curve along with that of the United States. Second, I omit the import-price variable (which presumably is less important for Europe as a whole than for individual countries). Finally, to reduce the noise in quarterly inflation rates, I study core inflation as measured by the weighted median of industry price changes (which is calculated by the Cleveland Fed for the United States and by Andrieu et al. (2013) for Europe).

As a robustness check, I estimate Phillips curves that include output as well as unemployment. My specification is

$$\pi_t = \pi_t^e + \alpha x_t + \epsilon_t$$

where again  $\pi^e$  is long-run expected inflation as measured by surveys, and  $x$  is the level of economic activity. I measure activity with a four-quarter moving average of detrended unemployment or detrended log output, computed with the Hodrick-Prescott filter. I estimate the equation for the United States since 1985 and for Europe since 1999.

**Table 1**  
Phillips curves

U.S., 1985Q1-2014Q4		
(1)	$\pi_t = \pi_t^e + \alpha \frac{1}{4}(\bar{y}_t + \bar{y}_{t-1} + \bar{y}_{t-2} + \bar{y}_{t-3}) + \epsilon_t$	
$\alpha$		0.265 (0.058)
$\bar{R}^2$		0.704
(2)	$\pi_t = \pi_t^e + \alpha \frac{1}{4}(\bar{u}_t + \bar{u}_{t-1} + \bar{u}_{t-2} + \bar{u}_{t-3}) + \epsilon_t$	
$\alpha$		-0.452 (0.084)
$\bar{R}^2$		0.732
Euro Area, 1999Q1-2014Q4		
(1)	$\pi_t = \pi_t^e + \alpha \frac{1}{4}(\bar{y}_t + \bar{y}_{t-1} + \bar{y}_{t-2} + \bar{y}_{t-3}) + \epsilon_t$	
$\alpha$		0.278 (0.046)
$\bar{R}^2$		0.494
(2)	$\pi_t = \pi_t^e + \alpha \frac{1}{4}(\bar{u}_t + \bar{u}_{t-1} + \bar{u}_{t-2} + \bar{u}_{t-3}) + \epsilon_t$	
$\alpha$		-0.553 (0.103)
$\bar{R}^2$		0.367

Note: OLS with robust (HAC) standard errors is used (standard errors in parentheses).

Table 1 reports the results. For both the United States and Europe, the coefficient on output is near 0.25, and the coefficient on unemployment is near -0.5. These results are consistent with an Okun's Law in which output rises by 2% when unemployment falls by one percentage point. The fit of the equations is good, especially for the United States (adjusted  $R^2 > 0.7$ ).

Chart 1 shows scatterplots of  $\pi - \pi^e$  against the output or unemployment gap, which confirm the good fit of the Phillips curve. Observations since 2007 are highlighted in red; we see no evidence that the inflation-activity relationship changed during the Great Recession.

What does the current state of the Phillips curve mean for monetary policy? Blanchard et al. stress that the effect of unemployment on inflation is smaller than it was 40 years ago, and conclude, "Trying to stabilise inflation may require very large movements in the unemployment gap". I think this statement is misleading, however. The biggest change in the Phillips curve is the anchoring of

expectations, and that makes it easier to stabilise inflation. If a shock pushes inflation up, anchored expectations push it back down without the need for a monetary tightening and higher unemployment.

A flat Phillips curve does, however, pose a problem for the euro area: it makes it difficult to restore competitiveness in the periphery by adjusting national price levels. Krugman (2015) provides an illustrative calculation for Greece, in which he assumes its real exchange rate is overvalued by 25%. He assumes the output coefficient in the Phillips curve is 0.25, which is close to my estimates in Table 1. With these numbers, Greece must

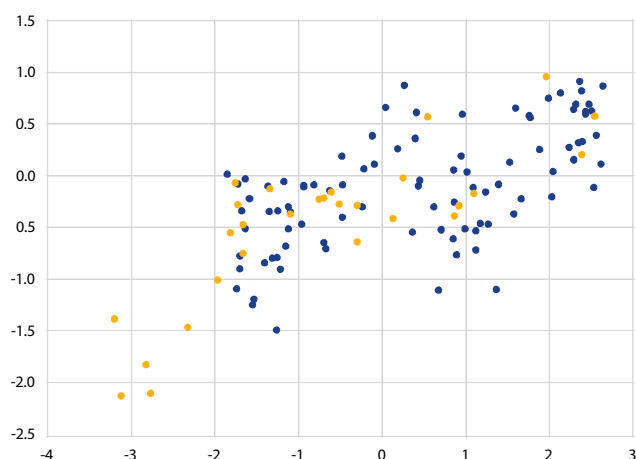
sacrifice 100% of a year's output to achieve the temporary decrease in inflation that it needs.

## Chart 1

Scatterplots of  $\pi - \pi^f$  vs. activity variable (red points show 2007 data)

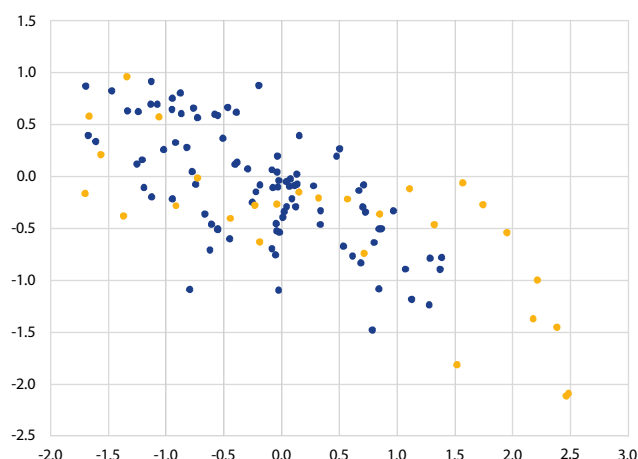
### a) United States; output gap

(y-axis: median- $\pi^f$ ; x-axis: YGAP (Avg. t...t-3))



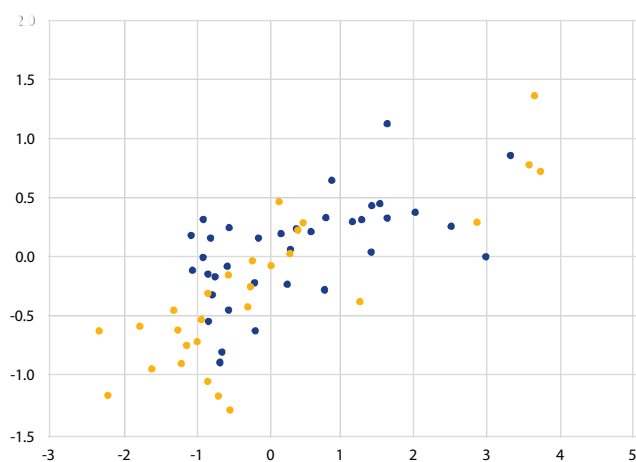
### b) United States; unemployment gap

(y-axis: median- $\pi^f$ ; x-axis: UGAP (Avg. t...t-3))



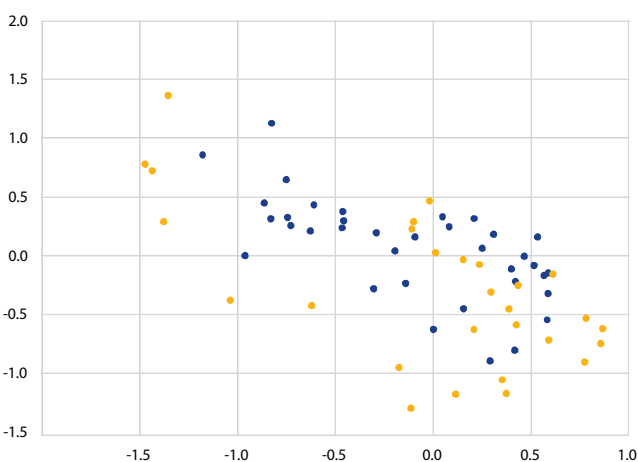
### c) Euro area; output gap

(y-axis: median- $\pi^f$ ; x-axis: YGAP (Avg. t...t-3))



### d) Euro area; unemployment gap

(y-axis: median- $\pi^f$ ; x-axis: UGAP (Avg. t...t-3))



This estimated cost is huge, yet it is conservative. The 100% figure is the total shortfall of output from its long-run level during Greece's adjustment. Krugman implicitly assumes that long-run output is not affected: hysteresis does not exist. If hysteresis effects are substantial, as Blanchard et al. find, then the cost of price-level adjustment is greatly amplified by long-term damage to the economy.

As many have noted, relative price adjustment in Europe could be accomplished either through lower inflation in the periphery or through temporarily higher inflation in the core. The costs of reducing inflation in already-depressed economies make a compelling case for the latter.

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