THOMAS J. SARGENT

University of Minnesota

"Rational Expectations": A Correction

I HAVE DISCOVERED an error in the computations of regression (3) and the regressions in Table 1 in my paper in *Brookings Papers on Economic Activity* (2:1973), on pages 452–53 and 460. With the exception of the lagged unemployment rates in those regressions, the instrumental variables in θ_t were all inadvertently lagged four more quarters than is reported in the paper. For example, m_{t-1} in equation (3) is actually m_{t-5}. The correct calculations are reported here in regression (3) and Table 1.

The F-statistic for regression (3) is now 4.5, which exceeds the value of 2.503 reported in my paper, and so is even more significant statistically. Thus, the test continues to point toward rejection of the natural rate hypothesis. The corrected results for Table 1 now detect neither a short-run nor a long-run Phillips curve using the log of the GNP deflator, p, the coefficient on the systematic part of Δp having t-statistics close to zero. The t-statistic on the systematic part of wage inflation in regression (5.2) is now -1.28, and fails to support rejection of the natural rate hypothesis. However, the coefficient on the "random" part of w in (5.2) is now larger than before both in absolute value and in statistical significance, so that the amended results for w are more favorable to the hypothesis of a tradeoff between unemployment and the surprise component of wage inflation.

(3) $\quad Un_t = 54.556 + 0.773 \; Un_{t-1} - 0.357 \; Un_{t-2} - 0.027 \; Un_{t-3}$
$\qquad\quad$ (15.819) $\;$ (0.175) $\qquad$ (0.212) $\qquad\quad$ (0.136)

$\qquad - 2.809 \; m_{t-1} - 10.046 \; m_{t-2} + 4.868 \; m_{t-3} - 0.003 \; Def_{t-1}$
$\qquad\quad$ (7.109) $\qquad$ (12.522) $\qquad$ (7.434) $\qquad$ (0.013)

$\qquad -0.240 \; Def_{t-2} - 0.023 \; Def_{t-3} - 17.151 \; p_{t-1} - 7.967 \; p_{t-2}$
$\qquad\quad$ (0.018) $\qquad\quad$ (0.016) $\qquad\quad$ (17.468) $\qquad$ (21.767)

$\qquad -14.502 \; p_{t-3} + 28.156 \; pc_{t-1} + 13.122 \; pc_{t-2} + 10.917 \; pc_{t-3}$
$\qquad\quad$ (18.157) $\qquad$ (20.014) $\qquad\quad$ (22.101) $\qquad\quad$ (19.059)

$\qquad +13.274 \; wr_{t-1} - 11.730 \; wr_{t-2} + 11.546 \; wr_{t-3} + 2.536 \; g_{t-1}$
$\qquad\quad$ (6.969) $\qquad\quad$ (9.164) $\qquad\quad$ (7.079) $\qquad\quad$ (2.620)

$$-7.224\ g_{t-2} + 0.345\ g_{t-3} - 11.132\ ng_{t-1} + 2.311\ ng_{t-2}$$
$$(3.652) \qquad (2.745) \qquad\quad (7.237) \qquad\quad (11.061)$$

$$- 0.938\ ng_{t-3} - 16.814\ y_{t-1} + 15.477\ y_{t-2} + 3.840\ y_{t-3}.$$
$$(8.519) \qquad\quad (5.240) \qquad\quad (6.562) \qquad\quad (5.544)$$

$\bar{R}^2 = 0.9652$; standard error of estimate $= 0.216$; Durbin-Watson statistic $= 1.941$;
$F\ (24,48) = 4.500$.

Table 1. Regression Results for Alternative Tests of the Natural Unemployment Rate Hypothesis[a]

Variable and regression statistic	Regression			
	4.1	*4.2*	*5.1*	*5.2*
Variable				
Constant	0.420	0.420	0.696	0.696
	(0.218)		(0.220)	
Unemployment rate lagged one quarter, Un_{-1}	1.715	1.715	1.666	1.666
	(0.115)		(0.116)	
Unemployment rate lagged two quarters, Un_{-2}	−1.046	−1.046	−0.999	−0.999
	(0.198)		(0.196)	
Unemployment rate lagged three quarters, Un_{-3}	0.245	0.245	0.216	0.216
	(0.115)		(0.114)	
Random (unexpected) part of inflation, based on the GNP deflator, p, or the wage index, w				
$p - \bar{p}$	30.322	...	...	...
	(19.976)			
$\hat{p} - \bar{p}$	...	61.848	...	...
		(37.420)		
$w - \bar{w}$	...	...	−11.924	...
			(9.447)	
$\hat{w} - \bar{w}$	...	...	...	−100.852
				(56.064)
Systematic (expected) part of inflation				
$\bar{p} - p_{-1}$	−0.170	−0.170	...	...
	(11.380)	(11.627)		
$\bar{w} - w_{-1}$	...	...	−13.282	−13.282
			(7.154)	(10.361)
Regression statistic				
$\bar{R}^2$	0.925	...	0.928	...
Durbin-Watson statistic	1.935	...	1.958	...
$\hat{a}$	1.01	1.00	−0.11	0.87
t-statistic	−0.01	−0.01	−1.86	−1.28

Source: Derived from equations (24) and (24′) of original article, using relevant official U.S. series from the data bank of the Wharton Econometric Model.

a. The period of fit is 1952:1–1970:4. The dependent variable is the unemployment rate. Standard errors are in parentheses. The standard errors for coefficients for regression (4.2) and (5.2) are asymptotic. For detailed definitions of symbols, see text of original article.