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A POLITICO-ECONOMIC MODEL OF THE U.K.: NEW ESTIMATES AND PREDICTIONS

We are grateful for Chrystal and Alt's extensive comments and criticisms of our politico-economic model as applied to the United Kingdom and the period 1959–74, i.e. from the government of Macmillan to the (second) government of Wilson (Frey and Schneider 1978). The two authors raise so many points and criticise our model in so many respects that for reasons of space it is quite impossible for us to go fully into each one of them. The main point of Chrystal and Alt's article is certainly that our model breaks down when it is extended beyond the estimation period (e.g. up to 1977) and – more fundamentally – that the popularity (lead) function and the policy function are mis-specified.

If these criticisms do indeed hold true, the functions we estimated for the earlier period (1959–74) would show insignificant and/or wrongly signed coefficients and the model would be incapable of providing good forecasts. Thus, instead of discussing the individual points on a purely theoretical level, we intend to show here that our politico-economic model also yields *statistically satisfactory* results if estimated for a more recent period (1958.1–1976.3) and that moreover our model yields superior *ex ante forecasts* for 1976.4–1979.3 compared to the 'permanent income' model suggested by Chrystal and Alt.

I. THE LEAD-FUNCTION

Estimating the lead function (1) used in our original paper over the more recent period 1958.1–1979.3 (OLS estimate) gives

$$\begin{aligned} LEAD_t = {} & \underset{(0\cdot89)}{13\cdot4} + \underset{(7\cdot25)}{0\cdot603^{**}}\, LEAD_{t-1} - \underset{(1\cdot84)}{0\cdot491}\, \Delta I_t - \underset{(-2\cdot49)}{1\cdot19^{*}}\, U_t \\ & + \underset{(2\cdot03)}{0\cdot217^{*}}\, GDY_t - \underset{(-2\cdot54)}{0\cdot743^{*}}\, NE_t - \underset{(-3\cdot11)}{0\cdot384^{**}}\, DEP_t; \qquad (1) \\ & \bar{R}^2 = 0\cdot69, \quad h = 1\cdot27, \quad \text{D.F.} = 75. \end{aligned}$$

The figures in parenthesis are *t*-values. * denotes *t*-value significantly different from zero at 5 %, ** at 1 %. All the parameter estimates are statistically significant at the 5 % level (or even 1 % level) – except for the *change* in the rate of inflation ΔI_t (we introduce this absolute difference $I_t - I_{t-1}$ in order to take the increasing trend in the rate of inflation into account). All the parameters have the theoretically expected signs, in particular an increase in the rate of unemployment U decreases, and an increase in the growth rate of real disposable income GDY increases, government lead. It may be noted that the coefficients are not dramatically different from those estimated for the earlier period in the original paper. The equation 'explains' 69 % of the variance, and the *h*-test suggests that there is no autocorrelation of the residuals.

Estimating the government popularity function used by Chrystal and Alt with the *same data* and the *same period* (and also introducing changes in the inflation rate) we get

$$\underset{}{\textit{Govt Pop}} = \underset{(34\cdot2)}{40\cdot2} - \underset{(-3\cdot80)}{0\cdot387^{**}}\ \textit{Trend} - \underset{(-3\cdot08)}{0\cdot491^{**}}\ \textit{Cycle} - \underset{(-1\cdot54)}{0\cdot301}\ \Delta I_t$$

$$- \underset{(-0\cdot98)}{0\cdot483}\ U_t + \underset{(1\cdot74)}{0\cdot193}\ GDY; \qquad (2)$$

$$\bar{R}^2 = 0\cdot50, \quad \text{D.W.} = 0\cdot98, \quad \text{D.F.} = 77.$$

The D.W. statistic suggests autocorrelation of residuals and 'only' 50 % of the variance is statistically accounted for. None of the economic variables is statistically significant.

The two functions (1) and (2) are now estimated with data for the period 1958.1–1976.3 and are then used to forecast the lead and popularity in the period 1976.4–1979.3 which lies *outside* the sample period (*ex ante* forecast), see Table 1.

Table 1

Ex ante Forecast of Government Lead and Popularity 1976.4–1979.3†

Statistical measures	Lead eq (1)	Popularity eq (2)
Theil's inequality coefficient	0·241	0·655
Average mean error of deviation (in %)	3·594	4·991

† For the ex ante forecasts the functions used for the forecasts are estimated over the period 1958.1–1976.3.

Both Theil's inequality coefficient and the percentage average mean error of deviation of the actual from the forecast figures indicate that the lead function (1) used by us has superior forecasting properties compared to the popularity function (2) used by Chrystal and Alt.

This suggests at least indirectly that the *economic* variables *do* contribute to explaining the government's standing with the voters. (A similar result is reached by Pissarides 1980).

II. THE POLICY FUNCTION

Estimating the Frey–Schneider policy function for the more recent period 1958.1–1979.3 with the GLS method gives the results shown in Table 2 for the policy instruments government consumption (*CON*), subsidies (*SUB*) and total revenues (*TR*). It may be noted that all parameters are statistically significant and have the signs which we theoretically derived in our original paper.

Table 2

Policy Function for the United Kingdom, 1958.1–1975.3

(GLS-estimates)†

Instruments	Constant (α_0)	Re-election effort: government lead deficit (α_1)	Ideological goals: Conservative government ($\alpha_3 C$)	Ideological goals: Labour government ($\alpha_3 L$)	Adjustment: With respect to ideological goals (α_2)	Adjustment: With respect to re-election effort (α_4)	Economic constraints: Balance of current account (α_5)	Economic constraints: Cost factors: Real wage rate (α_6)	Economic constraints: Cost factors: Unemployment (α_7)	$\bar{R}^2$	h	D.F.
CON	0·107	0·011**	0·012*	0·029**	0·513**	0·814**	0·017**	0·018**	—	0·99	1·07	74
	(0·87)	(2·82)	(2·02)	(3·51)	(24·23)	(29·47)	(3·07)	(5·41)				
SUB	−0·381	0·024**	0·009*	0·032**	0·604**	0·837**	0·013*	0·021**	0·274**	0·99	0·84	73
	(−1·84)	(3·11)	(2·13)	(3·78)	(15·47)	(19·47)	(2·61)	(4·31)	(3·51)			
TR	−0·431	−0·027**	0·014*	0·039**	0·547**	0·784**	−0·019**	0·038**	—	0·99	0·91	73
	(−0·74)	(−3·28)	(2·28)	(3·89)	(12·43)	(17·47)	(2·77)	(5·46)				

† As it is assumed that the various instruments are not independently used by the British government, it is very likely that the disturbances from them are correlated. If so, the technique of multivariate regression gives more efficient estimates, and is used here. The figures in parentheses below the parameter estimates indicate the t value. One asterisk indicates statistical significance at the 5 %, two asterisks at the 1 % level, using a two-tailed test, $\bar{R}^2$ is the corrected coefficient of determination; and h indicates the h-test statistic for autocorrelation of the residuals with lagged dependent variables; D.F. are the degrees of freedom.

Using the *same data* and the *same period*, the Chrystal-Alt policy function – their equation (3) – gives (by TSLS estimation)

$$CON = \underset{(-2\cdot99)}{-2\cdot719^{**}} + \underset{(3\cdot73)}{0\cdot0884^{**}}\ Y + \underset{(14\cdot54)}{0\cdot764^{**}}\ CON_{t-1};$$

$$\bar{R}^2 = 0\cdot99, \quad h = 1\cdot41, \quad \text{D.F.} = 79; \tag{3}$$

$$SUB = \underset{(-5\cdot45)}{6\cdot296^{**}} + \underset{(6\cdot23)}{0\cdot1564^{**}}\ Y + \underset{(18\cdot47)}{0\cdot794^{**}}\ SUB_{t-1}$$

$$\bar{R}^2 = 0\cdot99, \quad h = 1\cdot53, \quad \text{D.F.} = 79.$$

Judging from the test statistics, this estimate of the policy function looks satisfactory.

Table 3 compares the *ex ante forecasting* power of the Frey-Schneider model compared to the Chrystal–Alt policy function.

Table 3

Ex ante Forecast using the Policy Functions CON, SUB, and TR, 1976.4 – 1979.3†

	Frey–Schneider model			Chrystal–Alt model	
Statistical measures	*CON*	*SUB*	*TR*	*CON*	*SUB*
Theil's inequality coefficient	0·377	0·329	0·551	0·781	0·874
Average mean error of deviation (in %)	1·097	1·243	1·886	2·678	2·149

† For the *ex ante* forecasts the instruments are estimated over the period 1958.1–1976.3; for both forecasts the theoretical values of the lagged endogenous variable and the actual for the exogenous variables were used for the calculations.

Without exception all the statistical measures of the deviation of the actual from the forecast figures suggest that the Frey–Schneider model has a superior forecasting power. It should be noted that the *ex ante* forecasting period 1976.4–1979.3 includes a general election. One reason why the Chrystal–Alt function has a comparatively weak performance may be due to the fact that it is rather *ad hoc*, and is not based on theoretical reasoning with respect to voters' and politicians' behaviour.

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REFERENCES

Frey, B. S. and Schneider, F. (1978). 'A politico-economic model of the United Kingdom'. ECONOMIC JOURNAL, vol. 88, pp. 243–53.

Pissarides, C. A. (1980). 'British Government popularity and economic performance'. ECONOMIC JOURNAL, vol. 90, pp. 569–81.