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ERROR LEARNING AND RETURN-TO-NORMALITY IN PUBLIC FORECASTS: AN EMPIRICAL NOTE

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1. Introduction

The following paper adopts a somewhat unconventional approach to the assessment of public forecasts. The *formation* of public forecasts is analyzed using techniques commonly employed to examine the formation of private expectations. Attention is paid only to the revisions of forecasts in response to the flow of new information generated by realized forecast errors. The actual procedures used to make the forecasts are not considered, *i.e.* the forecasting techniques and the information base are treated as a "black box".[1]

For our purposes *public forecasts* are defined as statements about future events regularly made and brought before the public by government agencies or by private research institutes.[2] The regularity is important in our case because we are interested in the temporal behaviour of successive forecasts and forecast errors.

Our aim is to use time-series data to assess whether successive forecasts exhibit any systematic pattern. It should be stressed that the accuracy of public forecasts is not of interest *per se* in this paper.

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[1] For a description of the system of analyzing and forecasting short-term macroeconomic fluctuations in Finland, see Hämäläinen (1977).

[2] As far as macroeconomic forecasting is concerned government agencies and private research institutes are in different positions.Government agencies often control one or more policy variables and are thus able to influence a set of target variables, whereas private institutes must forecast the future policy actions of the authorities.

Forecasts are normally revised before final information about current conditions is available. Therefore we assume that the most recent forecast for the current period contains all available information about the current value of the variable under consideration.

Two hypotheses are considered. The first one, the *error learning hypothesis*, assumes that forecasts are revised proportionally with respect to the latest realized forecast error. Forecast errors are viewed as containing new information which the forecaster can use. The second hypothesis, the *return-to-normality hypothesis*, postulates that the variable in question has a long-run normal level, *e.g.* a trend rate of growth, towards which the variable tends to move provided enough time is allowed to elapse.

Our data set consists of three series of forecasts of seven major macroeconomic variables (see Appendix). One series is made up of forecasts prepared by the Ministry of Finance and the other two are forecasts made by the Research Institute of the Finnish Economy. The data cover 1971-1978, a period in which forecasting procedures underwent little change. Because of the shortness of the series rigorous statistical tests of the two hypotheses are not possible. Conclusions are mainly based on the visual inspection of scatter diagrams. In some cases simple regressions have been run but, needless to say, the results are, at best, only suggestive.

The plan of the paper is as follows. In section 2 the two hypotheses and the relationships between them are elaborated. The data are described in section 3, and the results are presented and commented upon in section 4. Conclusions are drawn in the final section.

2. Elaboration of the Hypotheses

The following notations will be used:

$E_t X_{t+k}$ = forecast made in period t about the value of X in period t+k, k > 0;

X_t = realization of X in period t;

N_t = the "normal" value of X in period t.

2.1 *Error Learning Hypothesis*

The (discrete) error learning hypothesis states that forecasts are revised periodically using information on the most recent realized forecast error:

$$(1) \qquad E_t X_{t+1} - E_{t-1} X_t = \alpha (X_t - E_{t-1} X_t)$$

The proportionality coefficient α, which is assumed to lie between zero and unity, tells how fast forecasts react to the flow of new information.

A coefficient of unity would imply that

$$(2) \qquad E_t X_{t+1} = X_t$$

i.e. the forecasts of X for the next period is equal to the current value of X. Forecasts of this kind are often called *static*.

If coefficient $\alpha = 0$ the forecasts are completely unaffected by new information.

The error learning hypothesis is better known as the *adaptive expectations* hypothesis. Since it was first proposed by Cagan (1956), it has been widely used in both theoretical and empirical work on the formation of private expectations. Recently members of the so-called rational expectations school (Muth, 1961; Sargent and Wallace, 1977) have questioned its validity. They argue that rational agents do not use mechanical rules like the one described by the adaptive expectations hypothesis but instead use all available information as efficiently as possible when forming expectations. Adaptive expectations would then be rational in only very special cases.

Testing the "rationality" of public forecasts is outside the scope of this paper. First, we do not know what the rational expectations theory of public forecasts would look like.[3] Secondly, we are aware of the existence of systematic forecasting errors over a number of years for many of our variables[4], which suggests that the rational expectations approach may not be valid in this case. Furthermore, as Benjamin Friedman (1979) has pointed out, rational expectations may be adaptive after all. In principle, Friedman's results should also hold for public forecasts: assuming that the forecaster does not have accurate information about the structural parameters of the economy but instead has only uncertain estimates of the parameters based on finite information, then the process of frequent re-estimation and updating will produce forecasts which appear to be adaptive even though the specification of the model describing the structure of the economy is approximately correct and all available information is used.

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[3] A rather sophisticated game-theoretic framework would presumably be needed since account should be taken of the fact that publishing a forecast may affect the behaviour of the public, see Grunberg and Modigliani (1954) and Johansen (1978, 236-250).

[4] This is especially true for inflation and unemployment forecasts, see Hämäläinen (1977, 115-116) and Pekkarinen and Suvanto (1979).

2.2. *Return-To-Normality Hypothesis*

According to this hypothesis, the forecaster assumes that the variable in question has a long-run normal level towards which it converges provided that enough time is allowed to elapse. All students of macroeconomics are familiar with the analogous *regressive expectations* hypothesis which is associated with Keynes's treatment of the determination of interest rates (see, *e.g.* Branson, 1972, 228-232).

Following Kane and Malkiel (1976) we write the return-to-normality hypothesis as follows:

$$(3) \qquad E_t X_{t+h} - X_t = - \beta(h) [X_t - N_t].$$

The coefficient $\beta(h)$ is assumed to lie between zero and unity. A negative $\beta(h)$ would imply a flight from normality, while a value of $\beta(h)$ greater than unity would imply overshooting. If $\beta(h) = 0$, the forecasts would be static. We also assume that $\beta(h)$ depends positively on the forecasting horizon h, *i.e.* $\beta'(h) > 0$. This follows directly from our assumption of a constant speed of adjustment towards the normal level. If the period is long enough, the system has time to return to normality, whereas in a very short period only a small move in that direction is possible.

Kane and Malkiel (1976) call return-to-normality forecasts (expectations) *non-autoregressive*. In this way they contrast them with error learning forecasts, which are *autoregressive*.[5] In some cases, however,

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[5] It is well known that the adaptive expectations formula, eq (1) can be written in an equivalent form in which the expected value of X is expressed as a geometrically distributed lag of all past realizations of X.

even optimal autoregressive forecasts may look exactly like return-to-normality forecasts. Assume, for instance, that z_t follows a stationary first-order autoregressive process with a constant mean n and with a positive autocorrelation coefficient

(4) $$z_t - n = \phi(z_{t-1} - n) + a_t;\ 0 < \phi < 1$$

where a_t is a white noise residual. The one period forecast conditional on the history of z is

(5) $$E_t z_{t+1} = \phi z_{t-1} + (1-\phi)n.$$

Subtracting the realization z_t from both sides gives

(6) $$E_t z_{t+1} = (1-\phi)(Z_t - n)$$

which is equivalent to formulation (3) with the assumption of a constant normal level $N_t X = n$. The interpretation would, however, be different.

2.3. *Dimensionality and the Forecast Profiles*

When these models are used to analyze public forecasts (private expectations) it is important to make clear the assumptions concerning the dimension of the variables, in particular, whether the models are in terms of *levels* or in terms of *rates of change.*

In our sample, the forecasts of five out of seven variables are expressed in terms of annual rates of change. Yet it is possible that the underlying view (or model) is based on the notion of a constant trend, so that the forecasts are made in terms of deviations from trend rather than in terms of rates of growth. For example, in theoretical models and discussions of economic policy it is often assumed that the trend rate of growth of real GDP is determined by exogenous factors such as technological change and population growth and that it does not vary much despite short-term (cyclical) fluctuations in recorded growth.

The implications of dimensional choices can be illustrated by comparing the *forecast profiles* implied by the different cases. The forecast profile is expected movement in the variable over the entire future horizon. It can be derived in a straightforward way by applying the chain rule to the forecasts. Figure 1 presents the profiles drawn on the assumption that the variable in question grows at a constant rate up to a certain point (the present) when an unanticipated absolute decline in the series occurs. It can be seen that views about the future implied by the two models depend to a great extent on the choice of the dimension.

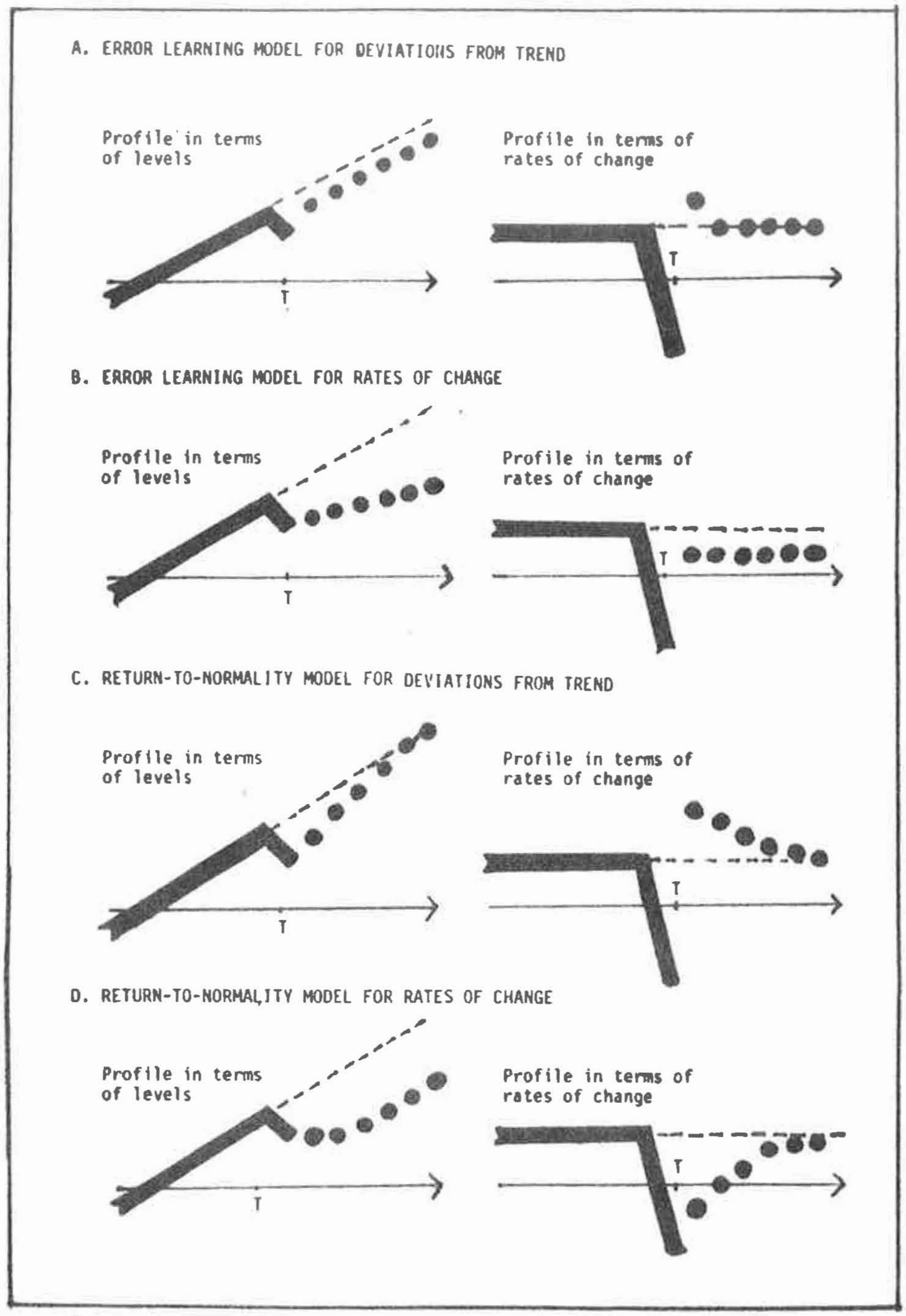
Figure 1 illustrates an interesting relationship between error learning and return-to-normality models in the special case of static forecasts for deviations from trend. In this case profiles A and D become exactly equivalent. The reason why this is so can be seen if the error learning model for trend deviations is written as follows:

$$(7) \qquad \ln(E_tY_{t+1}/\hat{Y}_{t+1}) - \ln(E_{t-1}Y_t/\hat{Y}_t) = \alpha^*[\ln(Y_t/\hat{Y}_t - \ln(E_{t-1}Y_t/\hat{Y}_t)]$$

where the hat over a variable indicates the trend level. This can be rewritten as

$$(8) \qquad \ln E_tY_{t+1} = \ln(1+g) + \alpha^*\ln Y_t + (a-\alpha^*)\ln E_{t-1}Y_t$$

FIGURE 1 FORECAST PROFILES



▬ history of the variable to be forecasted

----- historical trend ●●● forecasts made in period T.

where $g = \ln(Y_{t+1}/Y_t)$ is the trend rate of growth.

Subtracting $\ln X_t$ from both sides gives

$$(9) \qquad E_t\dot{Y}_{t+1} \equiv \ln(E_tY_{t+1}) = \ln(1+g) + (1-\alpha^*)\ln(Y_t/E_{t-1}Y_t).$$

In the case of static expectations $\alpha^* = 1$ and

$$(10) \qquad E_t\dot{Y}_{t+1} = \ln(1+g) \cong g$$

which is a special case of the return-to-normality model for rates of change

$$(11) \qquad E_t\dot{Y}_{t+1} - \dot{Y}_t = \beta^*(\dot{Y}_t - g);$$

when $\beta^* = 1$.

Recall that in cases when the error learning model and the return-to-normality model are compared in the same dimension, the assumption of static expectations implies a return-to-normality model with $\beta = 0$.

3. Data and Procedures

The data consist of three sets of successive forecasts of seven major macroeconomic variables:

(i) volume of exports (rate of change)

(ii) export prices (rate of change)

(iii) volume of private investment (rate of change)

(iv) gross domestic product at constant prices (rate of change)

(v) consumer prices (rate of change)

(vi) unemployment rate (per cent)

(vii) current account balance (billions of *Markka*)

The first two variables are normally considered exogenous in the case of a small open economy. The third variable, private investment, is also often seen to be dominated by an exogenous component which is difficult to forecast. The remaining four variables are important endogenous variables which receive much attention in the formulation of economic policy.

One forecast is made by the *Ministry of Finance* (*VVM*) and is published every autumn together with the National Budget proposal for the following year. The two other forecasts are made by a private research institute, *The Research Institute of the Finnish Economy* (*ETLA*) and published in the spring and the autumn.

The period is limited to 1971-1978 (*VVM* and *ETLA Autumn*) and to 1972-79 (*ETLA Spring*). It is our belief that forecasting procedures and underlying view (model specifications) have not changed much during this period.

The data are presented in the Appendix.

The procedure is very simple. The preliminary and, in fact, most conclusive analysis is carried out using scatter diagrams for the following two pairs of observations (cf. eqs. 1 and 3).

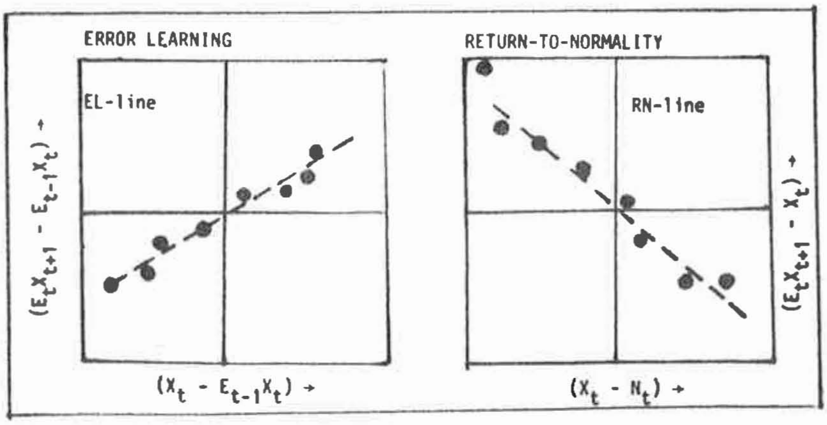
$$(E_tX_{t+1} - E_{t-1}X_t) \textit{ versus } (X_t - E_{t-1}X_t)$$

for the error learning model, and

$$(E_tX_{t+1} - X_t) \textit{ versus } (X_t - N)$$

for the return-to-normality model. If the forecasts are dominated by a error learning process the pairs of observations should lie approximately on an upward sloping line in the first diagram with the slope coefficient being equal to or less than unity. If, on the other hand the return-to-normality process dominates, the observations whould lie more or less on a downward sloping line in the latter diagram, the absolute value of the slope coefficient being equal to or less than unity. These cases are illustrated in Figure 2.

FIGURE 2 SCATTER DIAGRAMMES: AN ILLUSTRATION



As most of the published forecasts are expressed in terms of rates of change, we first assume that the underlying view is also based on this dimension (the exceptions being unemployment and the current account balance which are expressed in terms of levels). Subsequently this assumption is modified in two cases, *viz.* exports and gross domestic product.

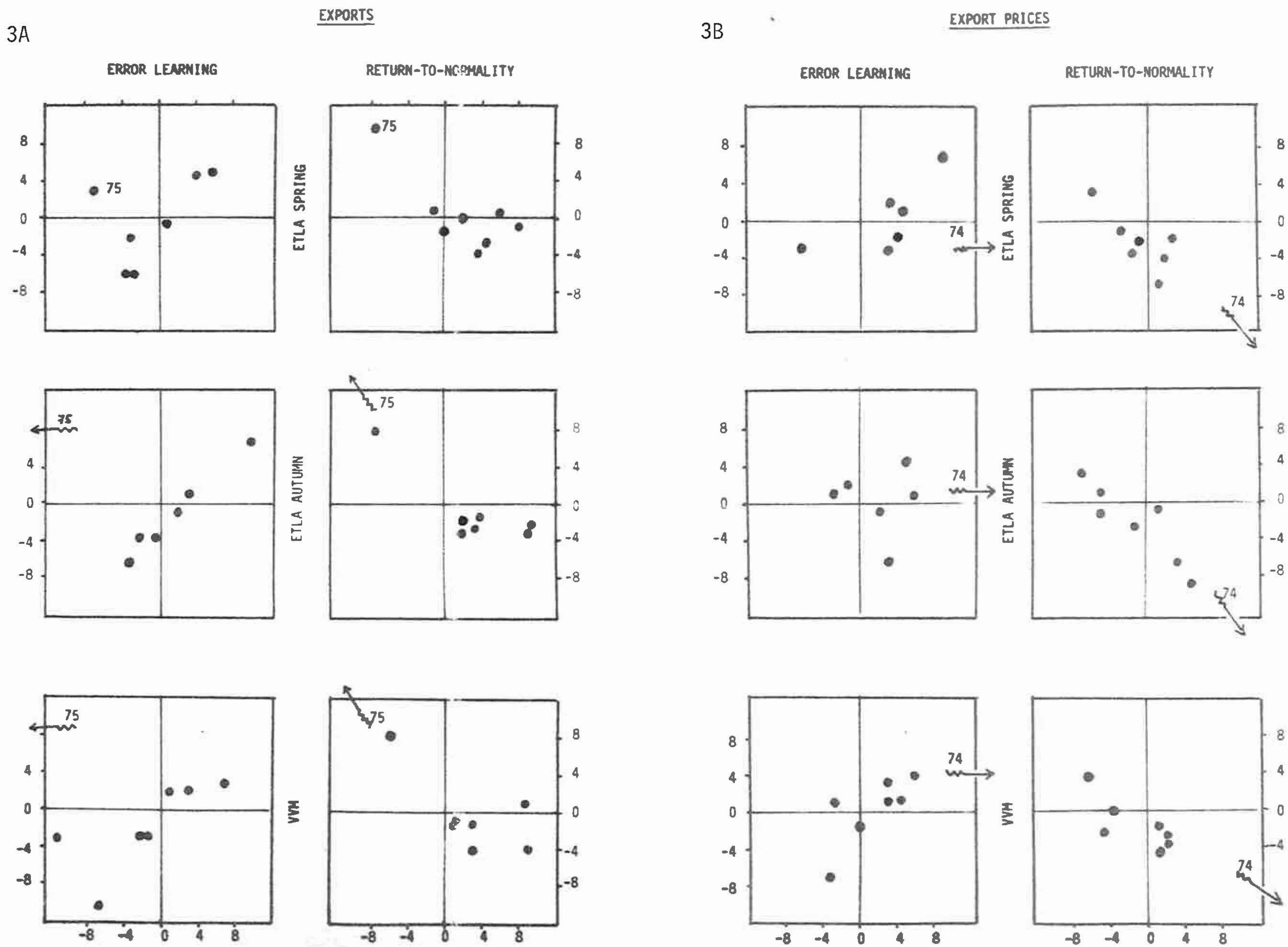
Because we are not interested in the accuracy of forecasts *per se* but only in how the forecasts are revised, we cannot use the final values for X since these are generally not known when the forecast is made. Therefore, we must rely on the most recent forecast of X for current year t as representing all information obtainable at the time the forecast is made. Forecast E_tX_{t+1} always refers to the next year.

When the scatter diagrams appeared to support one of the two hypotheses, we calculated the slope of the line in question using linear regression techniques. In drawing the return-to-normality diagrams we first made a rough guess of the normal level and, when the hypothesis received support, estimated the normal value using the intercept of the line in question.

4. Results

The results are presented in figures 3A-3G. Some summary statistics concerning best models are shown in table 1. We shall comment the diagrams variable by variable.

FIGURE 3 ERROR LEARNING AND RETURN-TO-NORMALITY IN PUBLIC FORECASTS: SCATTER DIAGRAMS

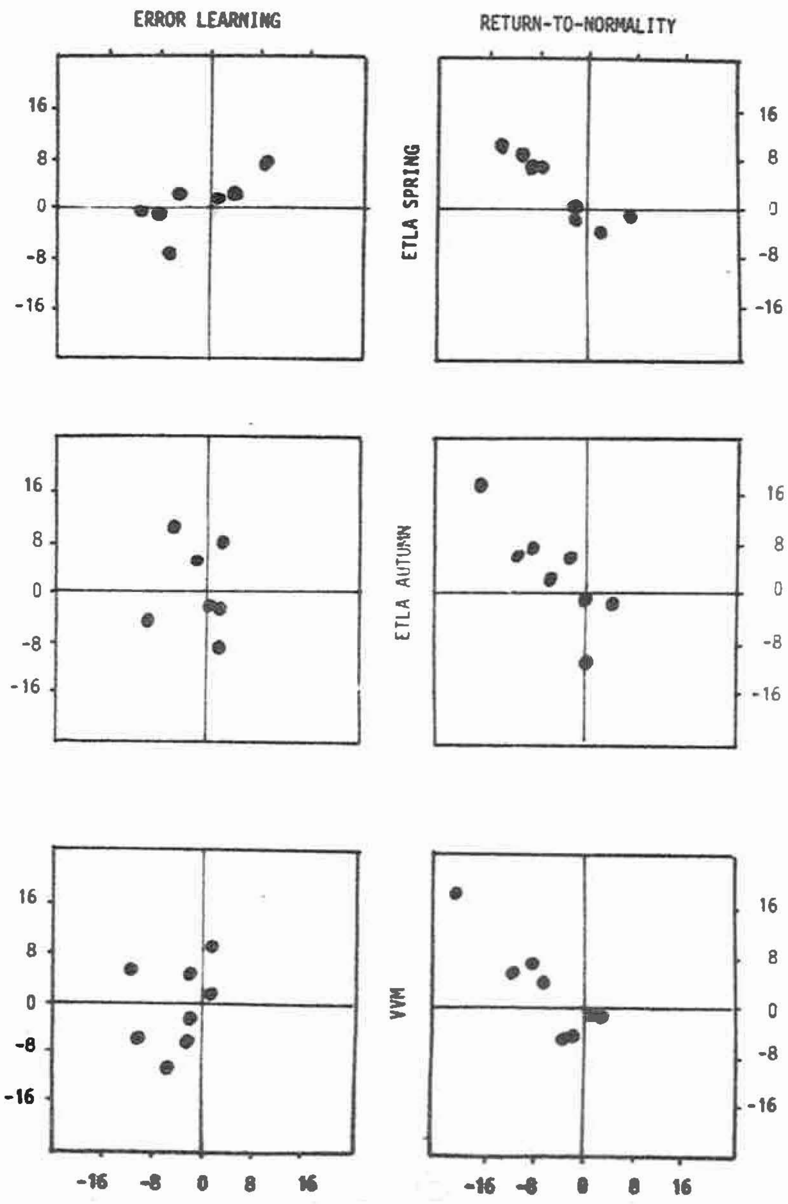


(cont.)

FIGURE 3 (cont.)

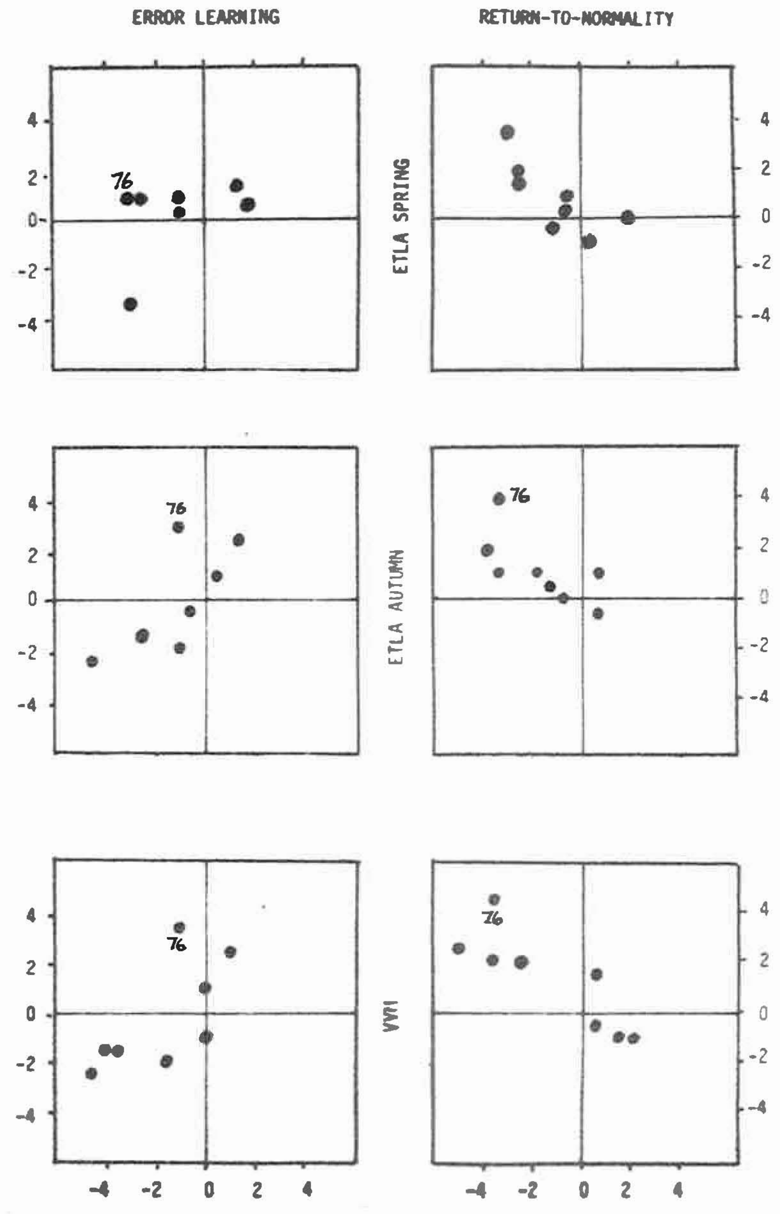
3C

PRIVATE INVESTMENT (VOLUME)



3D

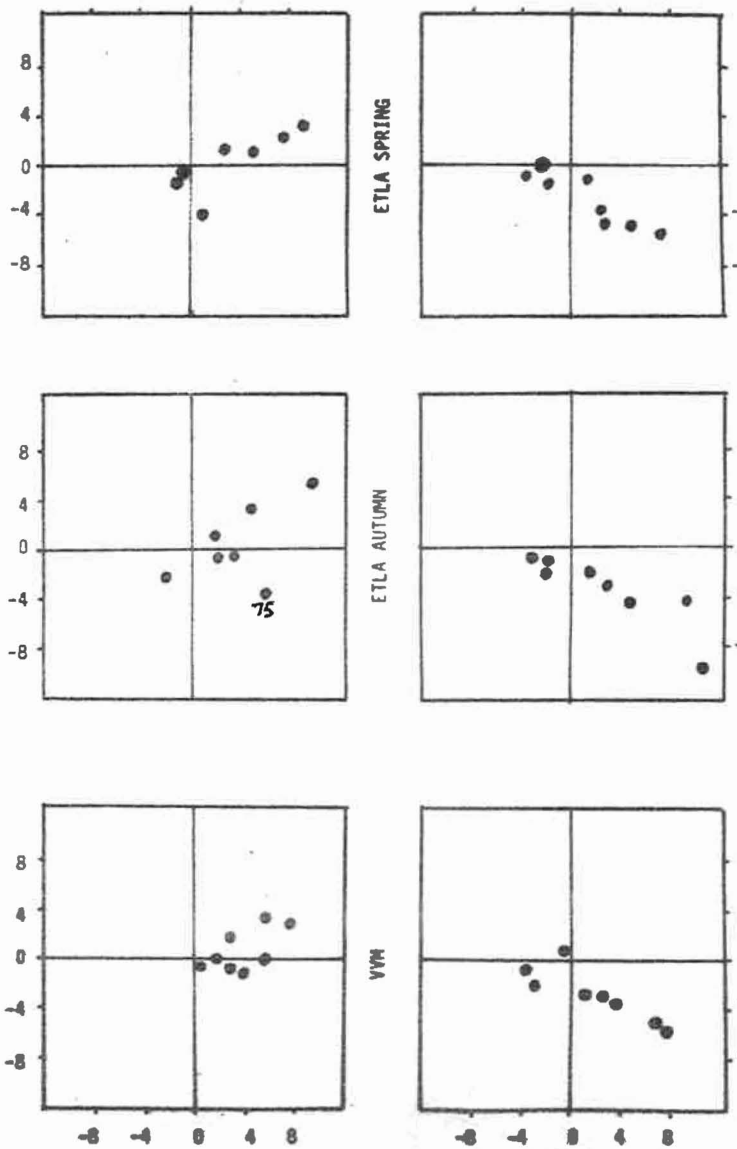
GROSS DOMESTIC PRODUCT (VOLUME)



(cont.)

3E

CONSUMER PRICES



3F

UNEMPLOYMENT RATE

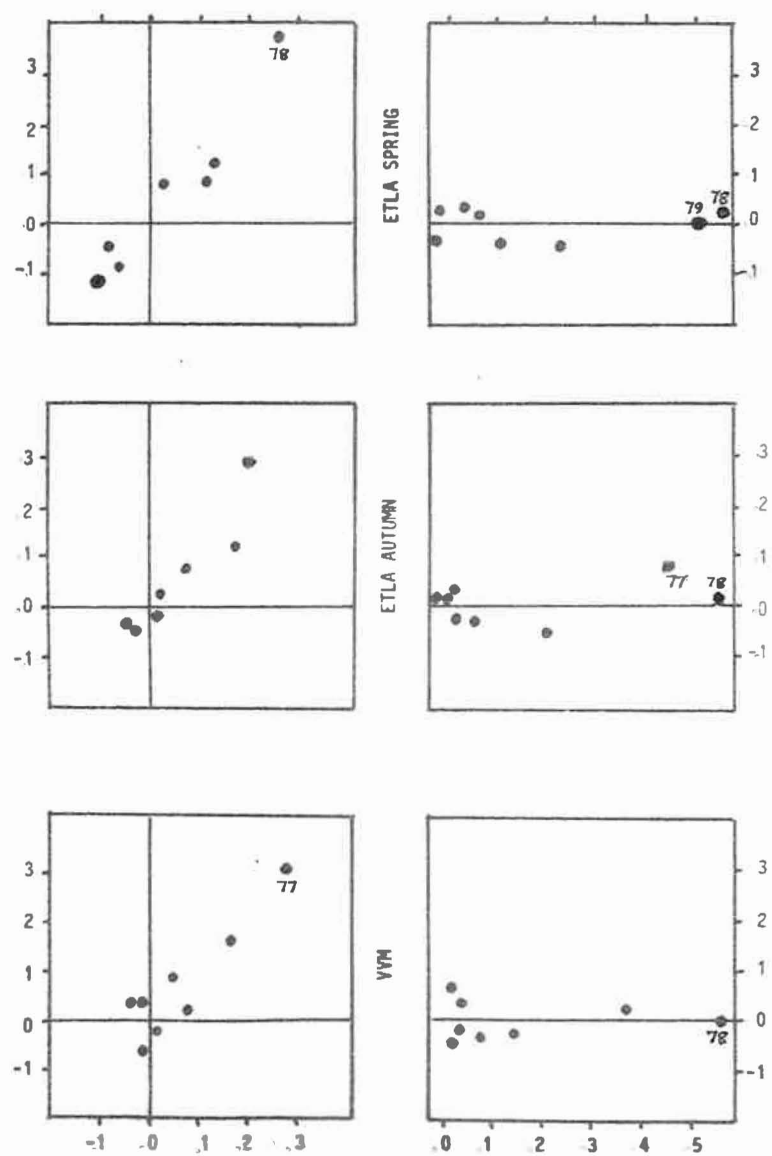
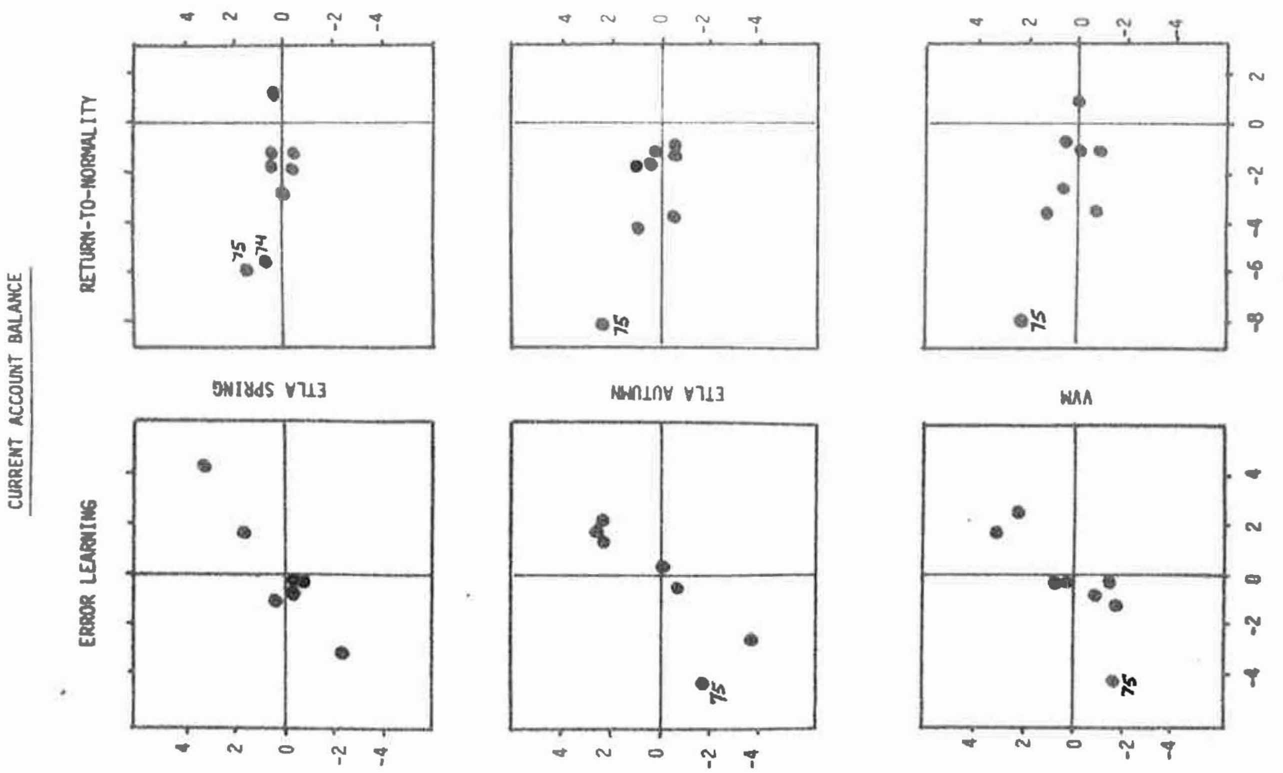


FIGURE 3 (cont.)

(cont.)

FIGURE 3 (cont.)



3G

TABLE 1 Slopes and Correlation Coefficients from the Best Models

Variable Forecast	Model	Slope	Correlation coefficient	Normality
Exports [a)]	EL			
ETLA Spring		1.24	.96	-
ETLA Autumn		0.97	.99	-
ETLA VVM		0.56	.72	-
Export prices	RN			
ETLA Spring		-1.12	-.96	7%
ETLA Autumn		-1.16	-.96	7%
VVM		-0.76	-.98	6%
Export prices [b)]	RN			
ETLA Spring		-0.83	-.79	7%
ETLA Autumn		-0.86	-.90	6%
VVM		-0.62	-.78	7%
Private investment	RN			
ETLA Spring		-0.71	-.93	5%
ETLA Autumn		-0.90	-.82	2%
VVM		-0.87	-.90	2%
Gross domestic product	RN			
ETLA Spring		-0.66	-.77	5%
ETLA Autumn		-0.58	-.70	4%
VVM		-0.57	-.77	5%
Consumer prices	RN			
ETLA Spring		-0.52	-.96	5%
ETLA Autumn		-0.52	-.89	6%
VVM		-0.46	-.89	5%
Unemployment rate	EL			
ETLA Spring		1.03	.99	-
ETLA Autumn		1.17	.75	-
VVM		1.00	.85	-
Current account balance	EL			
ETLA Spring		0.79	.94	-
ETLA Autumn		0.91	.88	-
VVM		0.79	.85	-

a) excluding 1975; b) excluding 1974

Exports. The decline in the volume of exports by 14 per cent in 1975 was perhaps the most severe real shock that Finland experienced in the 1970's. It came largely as a surprise. The error learning pattern seems to describe the forecasts for all years except this exceptional one relatively well. For the *ETLA* series, the correlation is very high and the slope of the error learning line is approximately one implying static forecasts for normal years (*i.e.* other than 1975).

Export prices. In 1974 most countries experienced a considerable deterioration in their terms of trade as a result of the increase in oil and other raw material prices. However, Finland did not witness any such deterioration because her export prices rose by 38 per cent in the same year. This rise was largely unanticipated. Even though the *ETLA Spring* and *VVM* forecasts exhibit some conformity with the error learning model when 1974 es excluded, the return-to-normality model is superior in all cases. Correlation coefficients are above 0.96 in absolute value, and the slope of the return-to-normality line is around -1 for both *ETLA* forecasts and -0.75 for the *VVM* forecasts.

Private investment. Successive forecasts behave very much as if they were based on a stable return-to-normality model. Correlation coefficients vary between -0.82 and -0.93, and the slope of the return-to-normality lines are between -0.7 and -0.9. A comparison of the *ETLA Spring and Autumn* forecasts suggests that the return-to-normality line is less steep for the spring forecasts than for the autumn forecasts, which does not support the hypothesis that the slope should be smaller the shorter the forecasting horizon.

Gross domestic product. In this case the evidence is mixed. *ETLA Spring* forecasts conform more closely to the return-to-normality model, whereas both models perform equally well (or equally badly) in the other two cases. The GDP forecasts are discussed in terms of deviations from trend below.

Consumer prices. Private inflation expectations are frequently modelled using the error learning hypothesis. Somewhat surprisingly, the public inflation forecasts in our sample conform more closely to the return-to-normality view than to the error learning view. In this respect the forecasts by the two different bodies are rather consistent. Correlation coefficients range between -0.89 and -0.96. The slope of the return-to-normality line is around -0.5. The implied normal level of inflation is between 5 and 6 per cent, which is about 5 per cent below the average rate of inflation in the 1970's. The systematic underestimation of the actual rate of inflation as well as the obvious return-to-normality pattern in the forecasts may be the result of deliberate efforts by the Ministry of Finance to dampen inflationary expectations.

Unemployment rate. During the first half of the 1970's, the unemployment rate fluctuated around 2 per cent. In 1976 it started to increase very rapidly and rose to the postwar record of 8 per cent in 1978. It seems evident that the rapid increase in unemployment came as a surprise to the authorities (cf. data appendix, see also Pekkarinen and Suvanto, 1979, 171-172). The unemployment forecasts follow the error learning process quite closely. There is only one slight exception, *ETLA Autumn* 1977, to this otherwise consistent pattern. The slope of the error learning line is approximately unity in all cases, which means that unemployment forecasts have been essentially static in the 1970's. This would be consistent with the view that all unemployment is structural and that the structure of the economy changes only very slowly.

Current account balance. This is another case in which the error learning model is unambiguously superior to the return-to-normality model. The *ETLA Spring* forecast data provide particularly strong evidence for this conclusion. Only the observations for 1975 are consistent with the return-to-normality view and even then the implied speed of the return is very slow.

In the following we present scatter diagrams constructed on the assumption that the underlying view is based on deviations from trend rather than on rates of change. In this case the two hypotheses are as follows:

$$(7)\qquad \ln(E_tY_{t+1}/\hat{Y}_{t+1}) - \ln(E_{t-1}Y_t/\hat{Y}_t) = \alpha^* [\ln(Y_t/\hat{Y}_t) - \ln(E_{t-1}Y_t/\hat{Y}_t)] \qquad \text{(error learning)}$$

and

$$(12)\qquad \ln(E_tY_{t+1}/\hat{Y}_{t+1}) - \ln(Y_t/\hat{Y}_t) = -\beta^* \ln(Y_t/\hat{Y}_t) \qquad \text{(return-to-normality)}$$

Denoting $\ln E_tY_{t+1} = [\ln(1+E_t\dot{Y}_{t+1})Y_t]$, where the dot over a variable indicates the rate of change, and taking into account the fact that $\ln(1+z) = z$ for small values of z, equations (7) and (12) can be approximated as follows:

$$(13)\qquad E_t\dot{Y}_{t+1} = g + (1-\alpha)(E_{t-1}\dot{Y}_t - \dot{Y}_t) \qquad \text{(error learning)}$$

and

$$(14)\qquad E_t\dot{Y}_{t+1} = g - \beta^* \ln(Y_t/\hat{Y}_t) \qquad \text{(return-to-normality).}$$

where g is the trend rate of growth.

We can now use the same data on forecasts and realizations expressed in terms of rates of change to evaluate our two hypotheses. For the return-to-normality model we also need data on realized deviations from trend. These were calculated by first estimating a constant exponential trend for the period 1960-1975. In the scatter diagrams the vertical axis represents $(E_t\dot{Y}_{t+1} - g)$, and the horizontal axis represents $(E_{t-1}\dot{Y}_t - Y_t)$ and $\ln(Y_t/\hat{Y}_t)$, respectively.

Diagrams were drawn only for two variables, export volume and gross domestic product. The diagrams are shown in Figure 4.

In neither case do the observations exhibit any systematic pattern. If anything, the return-to-normality diagrams would imply that $\beta^* = 0$, *i.e.* forecasts of deviations from trend are static. This would imply that $\alpha^* = 1$ in the error learning model, which, on the other hand, implies that the rates of change of these two variables are forecast according to the return-to-normality model with $\beta = 1$ (cf. p. 8-9).

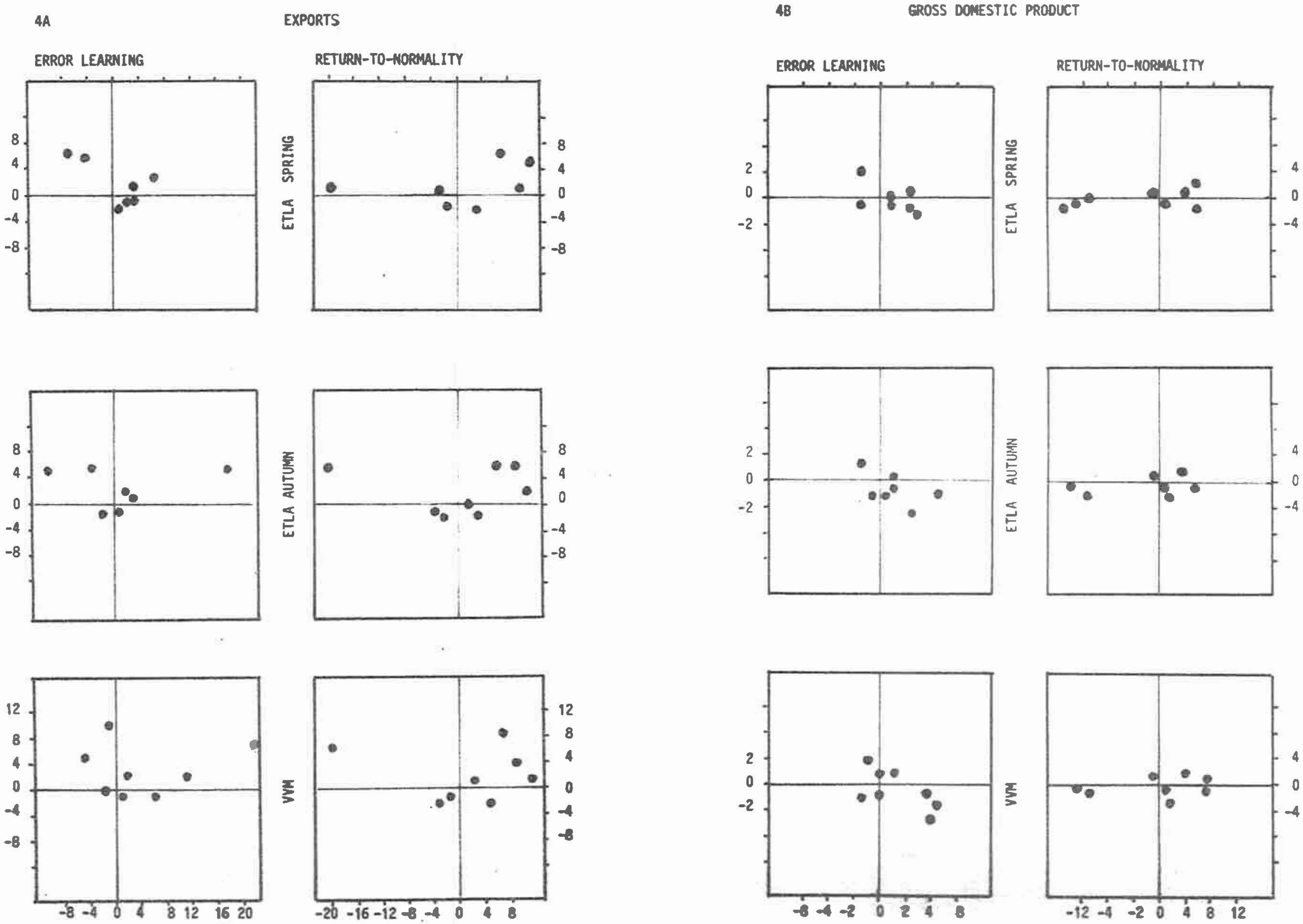
5. Conclusions

It could be argued that our way of looking at the formation of public forecasts is far too facile. We agree, at least to the extent that our data base is too limited to allow any firm conclusions to be drawn.

Unlike private expectations public forecasts are normally regarded as being produced in a fairly systematic manner: groups of people work together on a routine basis using econometric models and other forecasting aids. It might thus be asked whether it would be more reasonable to look at the forecasting procedures themselves and the properties of the models underlying the forecasts.

Forecasting procedures are, however, seldom purely mechanical. First, exogenous variables have to be forecast. Secondly, in practical work forecasts of endogenous variables are frequently manipulated in the light of

FIGURE 4 ERROR LEARNING AND RETURN-TO-NORMALITY: DEVIATIONS FROM TREND



outside information. An investigation of the behaviour of successive forecasts may give some idea of the 'view' of a forecaster even though he may not have worked out a formal model embodying that view.

R E F E R E N C E S

Branson, W. (1972). *Macroeconomic Theory and Policy*. Harper & Row: New York.

Cagan, P. (1956). "Monetary Dynamics of Hyperinflation". In *Studies in the Quantity Theory of Money*, ed. M. Friedman. Chicago: Chicago University Press.

Friedman, B. (1979). "Optimal Expectations and the Extreme Information Assumptions of 'Rational Expectations' Macromodels", *Journal of Monetary Economics* 5, 23-41.

Grunberg, E. and F. Modigliani (1954). "The Predictability of Social Events", *Journal of Political Economy* 62, 465-478.

Hämäläinen, Heikki (1977). *Taloudellisten vaihteluiden seuranta- ja ennakointijärjestelmän laadinta ja valvonta*. Helsinki: Elinkeinoelämän tutkimuslaitos A5.

Johansen, Leif (1978). *Lectures on Macroeconomic Planning. Part 2*. Amsterdam: North-Holland.

Kane, E.J.K. and B.G. Malkiel (1976). "Autoregressive and Non-autoregressive Elements in Cross-Section Forecasts of Inflation". *Econometrica* 44, 1-16.

Muth, J.F. (1961). "Rational Expectations and the Theory of Price Movements", *Econometrica* 29, 315-335.

Pekkarinen, Jukka and Antti Suvanto (1979) "1970-luvun talouspolitiikan keskeiset vaiheet". *Kansantaloudellinen aikakauskirja* 75, 159-164.

Sargent, T.J. and N. Wallace (1976). "Rational Expectations and the Theory of Economic Policy", *Journal of Monetary Economics* 2, 169-184.

Ministry of Finance, *Economic Survey*, various issues.

Research Institute of the Finnish Economy, *Economic Prospects in Finland*, various issues.

DATA APPENDIX

V V M   D A T A

		1971	1972	1973	1974	1975	1976	1977	1978	1979
(1)	GDP									
	E	5	3.5	6	5	3	1.5	5	2.5	3.5
	A	1.5	4.5	6	3.5	-1	0.5	0.5	2.5	
	T	2	7	6.5	4	1	0	0*	2*	
(2)	EXPORTS									
	E	10	7	10	7	4	12.5	14.5	4	5
	A	-1	14	8	5.5	-18	13.5	8	5.5	
	T	-1	14	7	-1	-14	14	9.5	8	
(3)	PRIVATE INVESTMENT									
	E	7	-2.5	6.5	7	4.5	-2	3.5	-1.5	3
	A	2	-2	7.5	5.5	3	-14	-7	-3.5	
	T	4	4	8	6	7	-11	-5*	-6*	
(4)	EXPORT PRICES									
	E	2	3	6	10	14	6.5	7.5	8.5	7
	A	5	6	12	40	11	3.5	12	8.5	
	T	5	6	13	43	7	7	14	6	
(5)	CONSUMER PRICES									
	E	3	5	5	8.5	11.5	11.5	10	9	8.5
	A	6	7	11	17	17,5	14.5	13*	8*	
	T	6	7	10	16	18	14	13	7.5	
(6)	UNEMPLOYMENT RATE									
	E	1.9	2.8	2.2	2.0	2.4	2.8	3.0	6.0	7.6
	A	2.4	2.6	2.3	1.9	2.1	3.5	5.7	7.6	
	T	2.3	2.5	2.3	1.7	2.2	4.0	6.1	7.5	
(7)	CURRENT ACCOUNT BALANCE									
	E	-0.5	-0.3	-1.0	-2.2	(-3.9)	-5.5	-2.2	-1.6	0.9
	A	-0.8	-1.0	-1.3	-3.5	-8	-3.6	-2.5	0.9	
	T	-1.4	-0.5	-1.7	-4.5	-8	-4.5	-0.6	2.4*	

E = autumn forecast for the next year
A = autumn forecast for the current year
T = final observed value (* preliminary)

(1)-(5) forecasts of annual rates of growth (per cent).
(6) forecasts of the unemployment rate (per cent).
(7) forecasts of the current account balance (bill.Fmk).

E T L A   D A T A

		1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
(1) GDP											
	E1			4.5	6	2.5	3.5	4.5	4	3	3.5
	E2		3	5.5	3.5	3	1.5	4.5	2	3	
	A1		3.5	6	3	1.5	1	3.5	1.5	4.5	
	A2	2	4.5	4.5	3	0.5	0.5	0	2.5		
	T	2	7	6.5	4	1	0	0*	2*		
(2) EXPORTS											
	E1			7	11.5	4.5	7.5	12.5	6.5	4.5	3.5
	E2		5	11.5	7.5	3.5	11.5	12	5.5	4.5	
	A1		7	11	8.5	-2.5	13	9.5	4	5	
	A2	-2.5	14.5	9	7	-16	14.5	8.5	7		
	T	-1	14	7	-1	-14	14	9.5	8		
(3) PRIVATE INVESTMENT											
	E1			3.5	10	2	2.5	1	3	2	3
	E2		0	7.5	6	3.5	-6.5	2.5	-2.5	2	
	A1		-3.5	12.5	4.5	6	-8.5	-4	-5.5	3	
	A2	-1.5	2	9	5	5.5	-12	-7.5	-4.5		
	T	4	4	8	6	7	-11	-5*	-6*		
(4) EXPORT PRICES											
	E1			5	7	4	10.5	7.5	8	4.5	6.5
	E2		4	6	10.5	11.5	5.5	6.5	7	6.5	
	A1		8.5	7.5	26	12.5	4	12	11	9	
	A2	5	5	11	34	14.5	3	13.5	9		
	T	5.5	6.5	12.5	38	7	7	14	6		
(5) CONSUMER PRICES											
	E1			5.5	6.5	10	12	8	9	7.5	7
	E2		6	6.5	9.5	15	11	10.5	10	7.5	
	A1		6.5	8	15	17.5	13	13	8.5	7	
	A2	7	8	11.5	19.5	21	14.5	13	8		
	T	6	7	10	16	18	14	13	7.5		
(6) UNEMPLOYMENT RATE											
	E1			2.9	2.0	2.7	2.2	3.0	4.2	8.1	7.0
	E2		2.9	2.4	2.3	2.0	2.4	3.8	6.8	7.8	
	A1		2.8	2.2	2.3	1.9	3.3	4.4	7.8	7.2	
	A2	2.5	2.6	2.4	1.8	2.1	4.1	4.7	7.7		
	T	2.3	2.5	2.3	1.7	2.2	4.0	6.1	7.5*		
(7) CURRENT ACCOUNT BALANCE											
	E1			-0.8	-1.7	-2.6	-4.9	-4.6	-2.9	1.8	1.5
	E2		-0.9	-1.5	-1.5	-4.1	-5.8	-3.4	-0.7	1.7	
	A1		-1.1	-1.1	-1.9	-5.7	-6.0	-2.9	1.5	1.3	
	A2	-1.1	-1.3	-1.3	-3.9	-8.2	-4.4	-1.7	1.5		
	T	-1.4	-0.5	-1.7	-4.5	-8	-4.5	-0.6	2.4*		

E1 = spring forecast for next year
E2 = autumn forecast for next year
A1 = spring forecast for current year
A2 = autumn forecast for current year
T = final observed value (* preliminary)

(1)-(5) forecasts of annual rates of growth (per cent).
(6) forecasts of the unemployment rate (per cent).
(7) forecasts of the current account balance (bill.Fmk).