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Forecasting aggregate demand components
with opinions surveys in the
four main EC-Countries -
Experience with the BUSY model (*)

Michel Biart

Peter Praet (**)

Internal Paper



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The Directorate-General for Economic and Financial Affairs,
Commission of the European Communities,
200, rue de la Loi
1049 Brussels, Belgium

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(**) Michel Biart is Principal Administrator in the Directorate-General for Economic and Financial Affairs, Commission of the European Communities, Brussels; Peter Praet is associate professor at the "Université libre de Bruxelles"

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TABLE OF CONTENT

	<u>page</u>
I. Introduction	3
II. General structure of the model	6
III. Realization equations	9
IV. Expectations equations	21
V. Forecasting performances	26
VI. Concluding remarks	29
References	30
List of Economic Papers	32

I. INTRODUCTION

This paper presents the results of the work undertaken by the European Commission on the contribution of opinion surveys in econometric modeling, in view of their practical use in very short-term forecasting.

Two main considerations have guided the research :

- surveys are to be used in forecasting. Several studies (1) have privileged the analytical exploitation of surveys, for example to test schemes of formation of expectations or to assess the role of expectations in economic theory. These results are not always of direct use in forecasting. Even when the main focus is forecasting, the specific contribution of surveys can be considered in different ways depending on the accent one puts on them. Survey variables can be incorporated in traditional econometric models (structural models) in order to improve the specification of some equations (2); alternatively they can be considered as the main predictors of economic variables. In this research the latter perspective is taken.
- surveys provide information only for the very near future. The comparative advantage of survey-based models results from the fact that they rely on direct, recent and rapidly available information. Knowing expectations at time t for a number of variables it is possible to infer within realization functions actual outcomes for time $t + \theta$, where θ represents the horizon of expectations. In traditional models, the exogeneous variables have first to be guessed before forecasts can be made.

This also shows the limits of survey-based models since for a forecasting horizon greater than the horizon considered in the surveys, opinions themselves will have to be guessed ("endogenized"). The necessity to predict people's opinions to predict their actual behavior considerably reduces the usefulness of surveys. Since surveys usually give information

(1) See in particular, Batchelor's extensive research on the EC business and consumer surveys (1984).

(2) This is typically the case of the French METRIC model.

for the next one or two quarters, their main use should be confined to very short-term forecasting i.e. provide estimates of present economic conditions (consider that national accounts data are published with long delays) and for the next one or two quarters. This is not to say that surveys cannot be used to generate longer-term forecasts, but this is not where their comparative advantage lies. We do believe that a forecasting horizon of 3-4 quarters should constitute a maximum for such models. This may look disappointing, but in the present context where markets and policy-makers are looking permanently for signals the importance of very short-term forecasts should not be underestimated, in particular because of the ability of surveys to predicts turning points.

The very short-term forecasting optic implies that the models we are looking for must be as compact as possible, i.e. it should not take longer than about one day per country to run the model (including updating).

Rather simple relationships have thus been tested in view of finding equations with good predictive power rather than models based on more elaborate theories. Particular attention was paid to the number of exogenous variables to be predicted in forecasting exercises.

According to the strict version of the rational expectations theory it is not necessary to collect empirical expectation data because an objective probability distribution of outcome exists for every set of information; according to this theory expectations of the average of the economic agents can therefore be simulated.

Many empirical studies have demonstrated that the assumption of strictly rational expectations is unduly rigourous, however. All in all, the findings of several empirical studies are arguments in support of a "weak" version of the rational expectations theory. The relevant literature refers to "semi-rational" expectations. It is assumed here that economic agents do not possess all the relevant information and that adjustments do not take place as promptly as is postulated in the "strict" version of the theory. Rather, cost-benefit considerations of economic agents determine the amount of information they possess and hence the duration of both the learning and adjustment processes.

The main implications for empirical economic research are that a mechanistic expectations-forming process (autoregressive expectations) cannot be assumed and that decisions and actions are not taken in such a rational fashion as postulated in the rational expectations theory. If the theory were right on the latter point, it would be sufficient, given an effective price mechanism, to keep a close watch solely on price movements in order to ascertain the expectations of economic agents.

For the above reasons, both the expectation-forming process and the decision-making process are much more complex and cannot be predicted using conventional econometric methods. There is, therefore, no substitute for empirically ascertained data on expectations such as those yielded by the EEC business and consumer surveys. However, many studies have clearly demonstrated that making optimal use of the planning data does not mean converting them directly into quantitative forecasts. Instead, it is better to incorporate planning data into an estimation model together with other information.

Empirical expectation variables of the type received as results of business and consumer surveys have not played a prominent role in econometric forecasting. Nevertheless even the rather fragmentary incorporation of empirical anticipations data has shown that this can help to improve the forecasting accuracy significantly (3).

The main difference between those approaches and the BUSY model (4) lies in the fact that the latter has been designed exclusively to take full advantage of the EC-business-, investment- and consumer survey results and thus use the judgements of consumers and entrepreneurs in a formalized way. How crucial judgements are in forecasting has been pointed out very explicitly by Evans (1983): "forecasts based strictly on econometric models - even though they accurately incorporate all present knowledge at the time of the estimation - will give inaccurate forecasts unless tempered with a large degree of judgement" (p.44). The authors think that it is a better way to use empirical judgements of the economic agents - collected on a representative basis - than to rely on the rather subjective way of fine-tuning by the econometrician.

(3) See Adams and Duggal (1974)

(4) For a description of the BUSY model, see Dramais (1982)

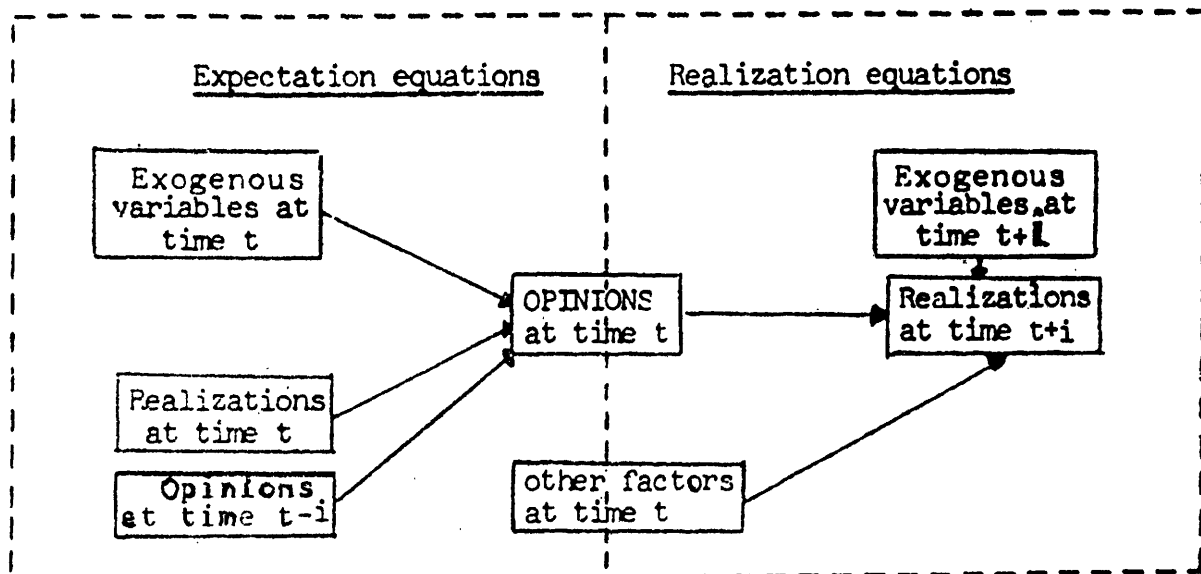
The paper is organized as follows. We start with a brief description of the general structure of the model (section 2) and comment on the main characteristics of the equation retained : realization equations (section 3) and expectation equations (section 4). The forecasting performances of the model are assessed in section 5.

II. GENERAL STRUCTURE OF THE MODEL

The general framework of the model was originally set up in the form of a macro-econometric model including businessmen's opinions only (BUSY model). The model was rather classical in that opinions intervened as determinants of a few economic variables (mainly production and selling prices). The present version of the model differs in that opinions have become the main determinants of actual outcomes and that extensive use is made of the opinions collected in the four surveys organized by the Commission of the European Communities i.e. the business survey, whereby industrialists give their point of view on the state of their business, the survey on the industrial investments planned and realized; an inquiry in the construction sector; and another one among consumers.

The model includes two main blocs : expectation equations and realization equations. The articulation of the two blocs is depicted in diagram 1.

Diagram 1. General articulation of the model



Opinions expressed at time t are determined by a set of information available at time t (mainly exogenous factors at time t , past realizations of the variable being expected and past opinions). In turn, opinions determine with other factors at time t realizations at time $t+1$. Realizations at time $t+1$ feedback into the expectation equations.

The mere existence of a bloc of expectation equations can be criticized since if expectations can be explained there is no need to include them in the realization equations. Hence, endogenous variables can directly be explained by the determinants of expectations. One should however bear in mind that opinions follow to a large extent autoregressive processes.

This weakness of opinion-based models has to be weighted against the advantage of the leading properties of opinion variables. This explains why the forecasting horizon of such models is generally limited to the very short-term. It should then be clear that the bloc of expectation equations is only necessary for forecasting periods extending beyond the horizon considered by survey respondents. For most endogenous variables estimates for the recent past and forecasts for the next quarter or two will be directly obtained from the realization equations (5). Surveys would be expected to be good predictors of actual outcomes, provided survey

(5) The Naggl model for Germany essentially belongs to this class of models (see Naggl, 1984).

respondents are well informed and rational to a large extent. Since all information available at the time opinions are expressed would be considered in expectation formation the "other variables" should play no role (or a limited role) in the prediction. Of course, errors of expectations do occur, since between t and $t+1$ (the expectation period) new information becomes available. The lesser economic agents are able to react to new information during the t --- $t+1$ period the closer the relationship between expectations and actual outcomes. The degree of sophistication of realization equations differs according to :

- the correspondance between the survey question and the variable to predict,
- the impact one attaches to new information within the expectation period.

For example, in a "pure survey" model private consumption in the next periods is mainly determined by expectations of the personal financial situation. The model is closed if one believes that all new information between t and $t+1$ will not significantly modify consumption plans. While this is a rather strong simplification (implying rigidities of behaviours) it is not necessarily too unrealistic in very short-term forecasting. Empirical evidence should help in deciding the tolerable degree of simplification.

In order to obtain forecasts for longer periods than the horizon considered by respondents opinions have to be endogenized. The specification of the bloc of expectation equations should take into account the fact that predictions of opinions for one or two quarters only are required (and not more). Simple models based on auto-regressive, moving average, error-learning processes supplemented by policy variables playing the role of news should provide a sufficient approximation (see below). It should be emphasized that, given our forecasting perspective, we do not necessarily need to "explain" opinions.

III. REALIZATION EQUATIONS

The interrelations between the variables in the realization bloc are represented in diagram 2. The endogenous variables have been kept aggregated, limiting the number of variables to explain to only six : total private consumption, equipment investment, construction investment, changes in inventories, exports and imports of goods and services (all variables in real terms).

a) In a first step each component of private domestic demand is estimated on the basis of opinions and a few exogenous variables :

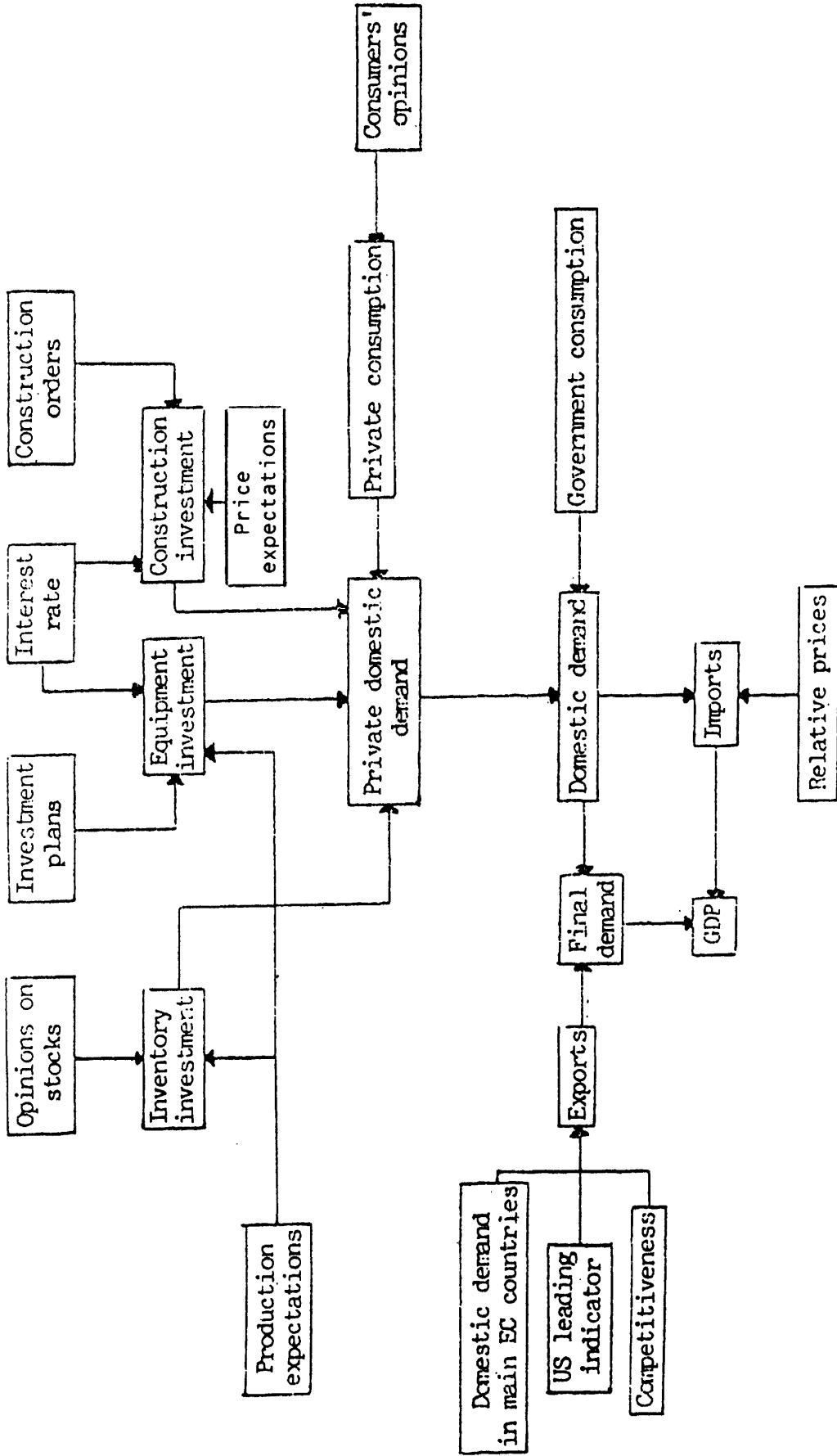
Private consumption

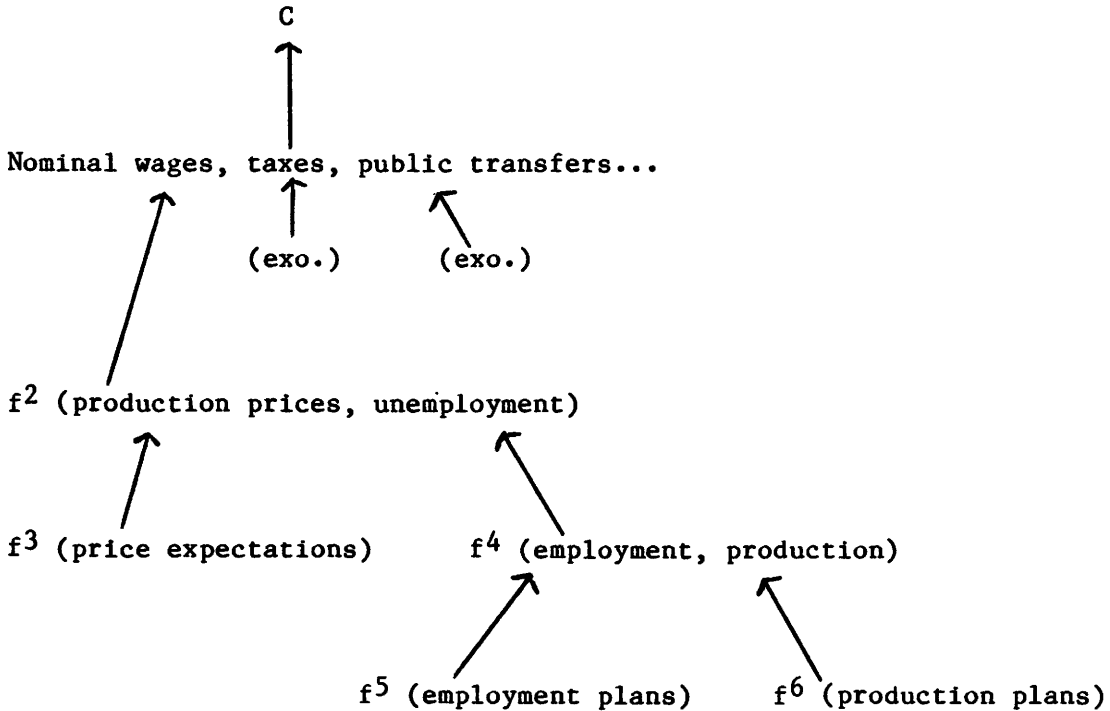
Changes of consumption ($\Delta_4 C$) are mainly explained by consumers' opinions on the general economic or personal economic or financial situation.

The specifications are based on Praet's work (1984) which showed that :

- . in spite of important measurement problems consumption functions incorporating opinion variables perform well in absolute and in comparison with standard economic models;
- . consumers'opinions predict changes in consumption only for the very short-term (between one and three quarters), notwithstanding the fact that survey questions refer to yearly periods;
- . econometric models based on selected opinions perform slightly better than models using the European Commission Consumer Confidence index.

The use of the consumer survey leads to a considerable simplification of the model. For example in the Naggl model for Germany the procedure for private consumption runs like this :





Production plans serve to forecast production which, with employment plans determine employment. Producer prices are predicted by price expectations from the business surveys. Output, prices and employment serve to forecast wages, which are a major determinant of consumption. In our specification, changes in real private consumption are directly obtained from the consumer surveys.

Investment

Gross domestic capital formation is split up into equipment and construction investment. Such disaggregation significantly improves the regression performances.

Equipment investment (IE) (in level) is mainly explained by investment plans derived from the investment survey, production expectations from the business survey and the long term interest rate (nominal). The investment survey is difficult to use as such because it provides figures in current prices and because it is conducted only twice a year, in March/April and in October/November. Ex ante real investment plans were derived by deflating the survey results by the forecasted developments of the gross fixed capital formation deflator (exogenous to the model).

Construction investment (IH) (in level) is explained by opinions on construction order books and by price expectations in preceding periods, the confidence index in industry and the long term interest rate.

Changes in inventories (ΔSt) (first difference of stocks) are explained by opinions on stocks, by production and price expectations (business survey) and by short term interest rates.

Total domestic demand is obtained by adding government expenditure (exogenous) to the above-mentioned items.

b) In a second step exports and imports of goods and services are estimated :

- imports (M) are made dependent upon private or total domestic demand and of the ratio between imports and GDP prices (lagged), as well as of an index of competitiveness (6)

- exports (X) of a country depend upon an index of total domestic demand in the three main other EC countries (derived from step one), the US leading indicator and the index of competitiveness (lagged).

The precise list of explanatory variables with their lags is given in Table 1 for each country. The four private domestic demand variables are explained by the following numbers of opinion and exogenous variables :

	<u>F</u>	<u>G</u>	<u>I</u>	<u>UK</u>
opinion variables :	6	6	5	8
exogenous variables :	4	3	3	3

(6) Competitiveness is defined as the ratio between the domestic wholesale price index and the competitors' corresponding weighted index, expressed in a common currency. The presence of this variable in some of the import functions is justified by the high import content of exports.

The lagged values of endogenous variables appear in the equipment investment equation, in all countries but the United Kingdom, and in the construction investment equation except for Germany. As shown in diagram 2 opinions do not directly intervene in the specification of the import/export functions but they contribute to the explanation via the domestic demand of the four countries.

The qualitative opinion variables have been measured by their balance statistic showing the difference between positive and negative replies (7). Studies by Fansten (1976), Abou and Szpiro (1984) for France show that the gain of precision due to alternative quantification methods (like the Carlson-Parkin derived methods) is very small.

The detailed regression results are given in table 2.

(7) As presented by the European Commission in "European Economy", Supplement B.

Table 1. List of the explanatory variables and their lags (a)

Explanatory variables	OPINION VARIABLES	OTHER VARIABLES
<u>Equip.invest.</u>	F Invest.plans(b), Prod.expect.(0) G Invest.plans(b) I Invest.plans(b), Prod.expect.(-1) UK Invest.plans(b), Prod.expect.(-1), Opin. on capacit.(-2)	Lagged endo., Time Lagged endo., L.T.interest rate(-2) Lagged endo. Time
<u>Construct.invest.</u>	F ----- G Construction orders(-3), Price expect.(construct.)(-7) I Construction orders(-3) UK Price expect.(construct.)(-5), Industr.confid.indic.(-2)	Lagged endo., L.T.interest rate (-2) ----- Lagged endo., L.T.interest rate (-2) Lagged endo.
<u>Inventories</u>	F Opinions on stocks(-2), Prod.expect.(-1) G Opinions on stocks(-2), Prod.expect.(-1) I Price expectations (construction) (-1) UK Price expectations (industry) (0)	Time S.T. interest rate (-1) S.T. interest rate (-1) S.T. interest rate (-2)
<u>Pr.consumpt.</u>	F Consumers'opinions(-1), inflation expect.(-3) G Consumers'opinions(0) I Changes in consumers'opinions on purch.of durables (0) UK Consumers'opinions(-2), changes in saving intent.(0)	Propensity to consume (-4) Propensity to consume (-4) Propensity to consume (-4) Propensity to consume (-4)
<u>Imports</u>	F ----- G ----- I ----- UK -----	Dom.dem.(0), Relat.prices (-2), Time Dom.dem.(0), Competitiveness (0), Time Dom.dem.(0), Relat.prices (-3), Time Dom.dem.(-3), Relat.prices (-5), Competitiveness (-2), Time
<u>Exports</u>	F ----- G ----- I ----- UK -----	For.dem.(-1,-2), Competitiveness(-1), Time For.dem.(0,-2), Competitiveness(-2), Time For.dem.(0,-2), Competitiveness(-2), Time For.dem.(0,-2), Competitiveness(-4), Time

(a) Lags are indicated between parenthesis
(b) Investment plans refers to four quarters

Table 2. Regression results

A. Private consumption (100 x Ln(C/C -4))

		Period	R ²	RHO1	RHO2	DW	COND.
FRANCE	0.124 SFAD ₋₁ - 0.059 PRAP ₋₃ - 34.076Ln(C/YD) ₋₄ (0.003) (0) (0)	1973-2-1985-3	0.95	0.45 (0.001)	-	1.98	7.0
GERMANY	0.051 GRO - 14.514 Ln(C/YD) ₋₄ (0) (0)	1972-3-1985-3	0.85	-	-	2.03	1.2
ITALY	0.152Δ ₄ ACHT - 7.671 Ln (C/YD) ₋₄ (0) (0.002)	1973-3-1985-3	0.87	0.72 (0)	-	1.99	1.1
UNITED KINGDOM	3.208+0.061 UKO ₋₂ +0.109Δ ₄ EPAP-10.271Ln(C/YD) ₋₄ (0.002) (0) (0.004) (0.15)	1975-1-1985-3	0.73	-	-	1.92	11.3

Symbols

SFAD = consumers'opinions on their personal financial situation

PRAP = consumers'opinions on future price trends

YD = disposable income

GRO = consumer confidence indicator composed of the expected financial situation, the expected general economic situation and purchase intentions

ACHT = consumers'opinions on purchase of durable goods

UKO = consumer confidence indicator composed of the expected financial situation and the perception of the general economic situation

EPAP = consumers'opinions on saving intentions

Between brackets : Probability that the t-statistic exceeds in absolute terms, the ratio of the value taken by the estimated coefficient on its standard error

R² = Coefficient of determination corrected for the number of degrees of freedom. It is uncentered when the regression has no constant term

RHO1 and RHO2 = Cochran-Orcutt coefficients for the first - and the second - order auto-correlations

DW = Durbin-Watson Statistic

B. Equipment investment (IE)

		Period	\bar{R}^2	RHO1	RHO2	DW	COND
FRANCE	0.823 IE-1 + 30.199 IC + 25.460 YFB + 47.057 TIME (0) (0.007) (0) (0.001)	1973-1-1985-3	0.9996	-	-	2.01	43.1
GERMANY	0.269 IE-1 + 0.424 IE-2 + 0.148 IC - 0.733 IRL-2 (0.05) (0) (0) (0)	1974-1-1985-3	0.9990	0.02 (0.85)	-0.45 (0.001)	1.98	105.7
ITALY	0.617 IE-1 + 5.404 IC + 2.478 YFB-1 (0) (0) (0)	1974-1-1985-3	0.9986	-	-	1.93	36.7
UNITED KINGDOM	12.058 IC + 3.219 YFB-1 + 3072.3 CAP-2 + 17.083 TIME (0) (0.09) (0) (0)	1976-2-1985-3	0.9981	-	-	2.10	34.6

Symbols

- IC = index of investment plans in industry for the current year, in real terms, based on the survey conducted in the autumn of the preceding year
- YFB = production expectations in industry
- IRL = long term nominal interest rate
- CAP = rate of capacity utilization, in industry, estimated through surveys

C. Construction investment (IH)

		Period	\bar{R}^2	RHO1	RHO2	DW	COND
FRANCE	$2775.19 + 0.945 \text{ IH}_{-1} - 101.817 \text{ IRL}_{-2}$ (0.004) (0)	1970-3-1985-3	0.97	-0.06 (0.64)	0.21 (0.12)	2.02	43.3
GERMANY	$55.016 + 0.130 \text{ COB}_{-3} - 0.048 \text{ CPRE}_{-7}$ (0) (0.002)	1975-4-1985-3	0.64	-	-	1.98	7.4
ITALY	$1.049 \text{ IH}_{-1} + 0.699 \text{ COB}_{-3} - 4.946 \text{ IRL}_{-2}$ (0) (0.06) (0.003)	1975-4-1985-3	0.9999	-	-	1.93	21.6
UNITED KINGDOM	$3155.73 + 0.491 \text{ IH}_{-1} + 3.711 \text{ CPRE}_{-5} + 7.905 \text{ CI}_{-2}$ (0) (0) (0.005)	1978-3-1985-3	0.88	-	-	1.98	71.8

Symbols

- IRL = long term nominal interest rate
- COB = opinions on order books in the construction sector
- CPRE = price expectations in the construction sector
- CI = confidence indicator in industry

D. Changes in inventories (ΔSt)

		Period	\bar{R}^2	RHO1	RHO2	DW	COND
FRANCE	$2.076 - 0.059 STB_{-2} + 0.111 YFB_{-1} + 0.052 TIME$ (0) (0)	1970-1-1985-3	0.65	0.17 (0.21)	-0.32 (0.02)	1.99	6.8
GERMANY	$6.291 - 0.126 STB_{-2} + 0.167 YFB_{-1} - 0.697 IRR_{-1}$ (0) (0.007) (0) (0.001)	1975-1-1985-3	0.63	-	-	1.97	6.9
ITALY	$15.04 PSB_{-1} - 34.623 IR_{-1}$ (0) (0)	1972-1-1985-3	0.76	0.22 (0.10)	-0.20 (0.14)	2.00	5.5
UNITED KINGDOM	$21.754 PSB - 68.138 IR_{-2}$ (0) (0)	1976-2-1985-3	0.64	0.13 (0.45)	-0.19 (0.25)	1.97	3.6

Symbols

- STB = opinions on the level of stocks in industry
- YFB = production expectations in industry
- PSB = selling prices expectations in industry
- IR = short term nominal interest rate
- IRR = short term real interest rate

E. Imports of goods and services (M)

		Period	\bar{R}^2	RHO1	RHO2	DW	COND
FRANCE	- 52.887 + 0.447 DD - 0.070 PMGS-4 + 0.228 TIME (0) (0) (0.002) (0)	1968-1-1985-3	0.998	0.55 (0)	0.34 (0)	1.99	26.8
GERMANY	0.354 DD - 0.302 COMP + 0.423 TIME (0) (0) (0)	1971-4-1985-3	0.9998	0.59 (0)	-	1.99	40.6
ITALY	- 1508.9 + 0.299 DD - 6.600 PMGS-3 + 22.140 TIME (0.002) (0) (0)	1970-4-1985-3	0.98	0.43 (0)	-	2.10	56.6
UNITED KINGDOM	0.303 DDG-3 - 31.213 PMGS-5 - 28.702 COMP-2 + 59.748 TIME (0) (0) (0.006) (0)	1972-3-1985-3	0.999	0.77 (0)	-0.38 (0.004)	2.08	36.1

Symbols

- DD = domestic demand from the private sector
- PMGS = ratio of import deflator to GDP deflator
- COMP = competitiveness index based on relative wholesale prices (a fall in competitiveness corresponds to an increase of the index)
- DDG = total domestic demand

F. Exports of goods and services

		Period	R ²	RHO1	RHO2	DW	COND
FRANCE	0.240 EEC-1 + 0.105 US-2 - 0.105 COMP-1 + 0.434 TIME (0.005) (0.008) (0.02) (0)	1971-3-1985-3	0.9997	0.61 (0)	0.24 (0.07)	2.01	23.8
GERMANY	1.123 EEC + 0.207 US-2 - 0.699 COMP-2 + 0.332 TIME (0) (0.002) (0) (0.06)	1975-3-1985-3	0.9996	0.33 (0.02)	-	1.99	118.9
ITALY	33.536 EEC + 11.865 US-2 - 24.132 COMP-2 + 23.854 TIME (0) (0) (0)	1974-3-1985-3	0.9994	0.43 (0.007)	-0.26 (0.08)	1.91	94.4
UNITED KINGDOM	101.982 EEC + 24.580 US-2 - 37.898 COMP-4 + 61.420 TIME (0) (0.005) (0)	1971-3-1985-3	0.9992	0.12 (0.36)	-	1.99	55.0

Symbols

EEC = indicator of total domestic demand in the three other main EC countries

US = US index of leading indicators

COMP = competitiveness index based on relative wholesale prices (a fall of competitiveness corresponds to an increase of the index)

Our judgement (8) on the quality of the regressions is synthesized in Table 3.

Table 3. Quality of the regressions

	France	Germany	Italy	UK
-Equipment investment	good	good (a)	good	good
-Construction investment	good (a)	weak	good(a)	good
-Changes in inventories	weak(a)	weak	weak(a)	weak(a)
-Changes in p. consumption	good (a)	good	good(a)	good
-Imports	good(a)	good (a)	good(a)	good(a)
-Exports	good(a)	good(a)	good(a)	good

(a) With correction for first and/or second-order auto-correlation

Among the 24 regressions 19 are considered as good. The weakest results are obtained for changes in inventories.

IV. EXPECTATIONS EQUATIONS

In order to get forecasts for periods longer than the ones implied by the lag structure some of the explanatory variables need to be predicted. Table 4 shows - for a forecasting horizon of the four quarters of a year and an observer at the end of the first of these - the number of figures which need to be predicted for both opinions and other explanatory variables.

(8) Based on the traditional statistical tests and on the examination of the stability of the regressions.

In practice we mainly need to endogenize production expectations and to a lesser extent opinions on stocks and consumers' opinions.

In the present state of the model expectations for the missing quarters are approximated by simple autoregressive schemes augmented by the nominal interest rate or the inflation rate. Detailed results for the expectations equations are reported in Table 5. It is worth mentioning that the nominal interest rate intervenes in the production expectation equations in the four countries.

Table 4. Four-quarter forecasting horizon : Number of quarters to be predicted for the explanatory variables (cf. Table 1)

	F	G	I	UK
<u>Opinions variables</u>				
Investment plans	0	0	0	0
Production expectations	3	2	2	2
Opinions on capacities	:	:	:	1
Construction orders	:	0	0	:
Price expectations (construction)	:	0	:	0
Industrial confidence indicator	:	:	:	1
Opinions on stocks	1	1	:	:
Price expectations (industry)	:	:	1	2
Consumers' opinions	2	3	3	1
Additional consumers' opinions	0	:	:	3
<u>Other exogenous</u>				
L.T. interest rate	1	1	1	:
S.T. interest rate	:	2	2	1
Propensity to consume	0	0	0	0
Government consumption	3	3	3	3
Relative prices	0	:	0	0
Competitiveness	2	3	1	1
US leading indicator	2	2	2	2

Table 5. Regression results for Expectation equations

A. Consumer opinions

		Period	\bar{R}^2	RHO1	RHO2	DW	COND
FRANCE	SFAD = - 0.765 + 0.910 SFAD-1 - 0.252 IRR (0.02) (0)	1972-4-1985-4	0.83	-0.65 (0)	-	1.90	3.4
GERMANY	GRO = 18.488 + 0.812 GRO-1 - 3.097 IR (0) (0)	1975-1-1985-4	0.96	-0.01 (0.93)	-0.43 (0.002)	1.83	7.2
ITALY	ACHT = - 0.944 + 1.121.ACHT-1 - 0.252 ACHT-2 (0.22) (0)	1975-1-1985-4	0.88	-	-	2.07	7.9
UNITED KINGDOM	UKO = 32.321 + 0.560 UKO-1 - 4.152 IR (0.001)	1978-1-1985-4	0.87	-	-	1.85	14.7
	EPAP = 2.838 + 0.782 EPAP-1 - 0.458 IR-1 (0.19) (0)	1974-2-1985-4	0.74	-	-	1.90	10.5

For the meaning of symbols, see Table 2 A, p. 11 (IR and IRR = short term nominal and real interest rates)

B. Production expectations in industry (YFB)

		Period	\bar{R}^2	RH01	RH02	DW	COND
FRANCE	11.288 + 1.346 YFB-1 - 0.634 YFB-2 - 1.053 IR-2 (0) (0) (0)	1971-1-1985-3	0.87	-0.36 (0.009)	-0.18 (0.17)	1.94	9.8
GERMANY	2.597 + 1.406 YFB-1 - 0.684 YFB-2 - 0.586 IR-2 (0.03) (0) (0)	1975-3-1985-3	0.83	-0.52 (0)	-0.43 (0.004)	2.03	9.1
ITALY	3.339 + 1.561 YFB-1 - 0.785 YFB-2 - 0.289 IR-1 (0.22) (0) (0)	1974-1-1985-3	0.76	-0.68 (0)	-0.28 (0.08)	1.89	12.2
UNITED KINGDOM	16.292 + 1.355 YFB-1 - 0.607 YFB-2 - 1.176 IR-1 (0.001) (0) (0)	1976-2-1985-4	0.87	-0.44 (0.004)	-	2.15	14.1

Symbols

IR = short term nominal interest rate

C. Selling prices expectations in industry (PSB)

		Period	R ²	RHO1	RHO2	DW	COND
ITALY	$1.409 \text{ PSB}_{-1} - 0.661 \text{ PSB}_{-2} + 10.489 \text{ DPGDP}$ (0) (0)	1971-1-1985-3	0.98	-0.13 (0.32)	-	2.02	13.4
UNITED KINGDOM	$33.450 + 1.470 \text{ PSB}_{-1} - 0.741 \text{ PSB}_{-2} - 0.627 \text{ IR}_{-2} - 0.338 \text{ TIME}$ (0) (0) (0.002) (0)	1976-2-1985-4	0.93	-0.47 (0.007)	-0.27 (0.11)	1.99	30.3

Symbols

DPGDP = 100 times the ratio of the values taken by the deflator of the GDP, in the current quarter and 4 quarters before
 IR = short term nominal interest rate

D. Competitiveness index (COMP)

		Period	R ²	RHO1	RHO2	DW	COND
FRANCE	$10.077 + 1.384 \text{ COMP}_{-1} - 0.487 \text{ COMP}_{-2}$ (0.006)	1968-1-1985-4	0.88	-0.004 (0.97)	-0.16 (0.18)	1.95	103.1
GERMANY	$6.830 + 1.114 \text{ COMP}_{-1} - 0.184 \text{ COMP}_{-2}$ (0.06) (0)	1967-3-1985-3	0.90	-	-	2.0	100.6

V. FORECASTING PERFORMANCES

The forecasts made with the help of the preliminary version of the model can now be assessed. They only refer to the years 1984 and 1985 and have thus an illustrative purpose.

For 1984, the forecast may be called "ex post". The model - established in 1985 - was reestimated without the observations referring to that year. Figures for 1985 were then forecast, using for the exogenous variables (interest rate, public expenditure) the assumptions made by the Commission in 1984. It must be acknowledged that the selection of the BUSY equation was made with the benefit of hindsight. The 1985 figures are "ex ante" forecasts carried out in April 1985. They should therefore carry more weight when assessing the usefulness of the model.

Table 6 presents a comparison of the BUSY results with the CEC forecasts finalized in May/June of both years and with the actual data. Clearly, a simple econometric exercise such as our own cannot match the present forecasting procedures as regards GDP. The CEC data are constantly better for that variable

With respect to the components of GDP, the case is less clear. For 1984, the CEC forecasts were closer to the mark in 12 cases, the "ex post" BUSY figures in 10. The evidence for 1985 gives the advantage to the CEC in 16 instances and to the "ex ante" BUSY in 6.

The above presentation would be misleading if it led to infer that the two forecasting methods are seen as offering an alternative. BUSY can only aim at influencing the CEC forecasting exercises by providing, in the course of forecasting rounds, additional information systematically derived, to a large extent, from the CEC surveys. It can also be used as a tool for monitoring between forecasts.

All in all, in instances of significant discrepancies between a BUSY proposal and another figure considered by the Commission, BUSY might well be right and this would deserve another look at the case before the Commission finalizes its forecast.

Table 6. Forecast and actual annual growth rates

Germany

	Investment equip.	constr.	Δ Stocks (a)	Private consumption	Imports	Exports	GDP
BUSY forecast							
84	2.6	2.9	1.3	1.1	5.7	7.2	3.3
85	15.3	-1.7	1.1	1.1	4.0	6.4	3.4
CEC forecast							
84	6.4	4.7	1.3	1.2	6.6	8.6	3.0
85	9.8	-3.8	1.0	1.4	5.0	7.0	2.5
Actual							
84	-0.4	1.5	0.7	0.8	5.2	8.2	3.0
85	9.3	-6.2	0.8	1.7	4.7	7.2	2.4
(a) in % GDP for BUSY and CEC forecasts, in % GNP for actual data							
(b) Actual data on GNP							

France

	Investment total	Δ Stocks (a)	Private consumption	Imports	Exports	GDP
BUSY forecast						
84	1.3	2.2	0.6	4.8	11.2	4.0
85	0.6	1.1	0.2	3.6	6.3	0.8
CEC forecast						
84	0.5	0.7	0.9	3.4	5.2	1.1
85	0.3	1.1	0.9	2.8	4.2	1.1
Actual						
84	-1.3	0.7	1.1	3.6	7.2	1.5
85	2.8	0.4	2.4	5.2	2.4	1.3
(a) in % GDP						

United Kingdom

	Investment equip.	constr.	△ Stocks (a)	Private consumption	Imports	Exports	GDP
BUSY forecast							
84	6.1	5.9	0.7	3.7	9.1	8.2	4.5
85	1.9	-3.4	0.1	1.9	1.7	2.2	2.3
CEC forecast							
84	6.5	3.9	0.5	2.7	6.1	5.3	2.7
85	6.4	-0.4	0.2	2.0	4.5	7.7	3.5
Actual							
84	9.0	7.1	-0.1	1.9	9.5	7.2	1.9
85	6.1	-3.3	0.4	2.8	3.0	6.0	3.3
(a) in % GDP							

Italy

	Investment equip.	constr.	△ Stocks (a)	Private consumption	Imports	Exports	GDP
BUSY forecast							
84	5.9	1.9	1.1	1.4	6.9	8.6	3.5
85	14.3	3.9	1.5	3.2	6.9	5.1	4.7
CEC forecast							
84	1.6	2.9	0.3	2.1	6.6	5.6	2.4
85	6.7	1.3	0.6	2.3	5.6	4.2	2.6
Actual							
84	14.1	-0.5	0.5	1.9	9.2	6.5	2.8
85	9.9	-1.7	0.4	1.9	9.4	8.2	2.3
(a) in % GDP							

VI. CONCLUDING REMARKS

This paper presents for four main EC Countries a forecasting model of aggregate demand components based on the various tendency surveys conducted for the Commission of the European Communities. Our objective was to work-out a handy model both in terms of data requirement and computation as it is to be used regularly for very short-term forecasting. In spite of a great simplicity of the specifications the regression results prove quite acceptable.

Forecasting exercises have been performed and compare reasonably well with the results of more elaborate procedures.

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