le sixième colloque international sur la prévision

Paris, 15~18 Juin 1986

Par June 15 18 1986

the sixth international symposium on forecasting

Le Maire de Paris *Paris, le*

C'est avec un très grand intérêt et un vif plaisir que Paris accueille cette année le sixième Symposium international de prévision qui rassemble les personnalités les plus éminentes dans ce domaine.

Recherchant sans cesse de nouvelles techniques, la prévision est devenue un élément déterminant de toute prise de décision.

Or aujourd'hui plus que jamais se trouve vérifié l'adage fameux "gouverner c'est prévoir".

Aussi, dans tous les secteurs de la vie contemporaine, finance, planification, politique économique et sociale, ceux qui sont investis de la responsabilité de faire des choix pour l'avenir trouvent dans ceux qui manient la délicate science de la prévision des auxiliaires précieux.

Votre spécialité nous permet en effet de faire reculer les limites de l'incertain. Sans donner, certes, d'illusoires garanties ou une sorte d'assurance contre les aléas du futur, la prévision permet de tempérer la rigueur de la belle formule de Paul VALERY selon laquelle "nous entrons dans l'avenir à reculons".

Paris a également pour ambition de conjuguer passé, présent et futur, de préserver son patrimoine en préparant ses lendemains, de trouver un équilibre harmonieux entre une histoire prestigieuse, mais qui pourrait la condamner à devenir ville-musée, et sa volonté affirmée d'aller de l'avant, avec dynamisme.

C'est pourquoi je me réjouis sincèrement que la capitale française ait été choisie pour la tenue de votre réunion à laquelle je souhaite la bienvenue, au nom de la municipalité parisienne, en formant des voeux très chaleureux pour le succès de ses travaux.

JC

THE MAYOR OF PARIS

It is with great interest and pleasure that Paris hosts this year the Sixth International Symposium on Forecasting which attracts the most eminent personalities of the field.

Through a continuous search for new techniques, forecasting has become a critical element in all forms of decision making.

Today more than ever the famous saying "governing is forecasting" seems true.

Also, in all aspects of modern life, finance, planning, political economy and social affairs those who are given the responsibility for making future choices find valuable help from forecasters.

Your speciality allows us, in effect, to push back the boundaries of uncertainty. Without giving illusory guarantees or assurances against the vagaries of the future, forecasting can temper the effects of Paul Valery's well known quotation according to which "we enter the future backwards [blind]".

Paris is interested in combining past, present and future, in preserving its inheritance while preparing for tomorrow, in finding a harmonious equilibrium between a prestigious history, (which could condemn it to become a city-museum) and its expressed wish to go forward, with dynamism.

This is why I am sincerely delighted that you choose the French capital to hold your conference this year. I wish you welcome, in the name of the Parisian municipality, and send very warm wishes for the success of your gathering.

Signed
Jacques CHIRAC

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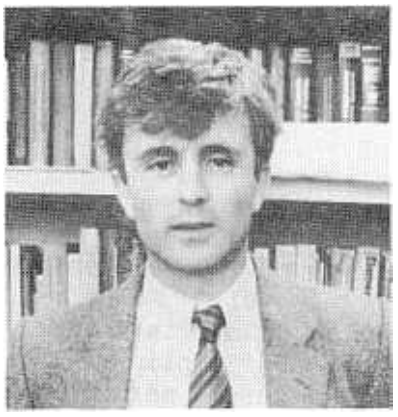
Message from the General Chairperson



On behalf of the ISF 86 organizing committee and the International Institute of Forecasters I welcome you to the Sixth International Symposium on Forecasting.

Forecasting has witnessed a tremendous growth in the last 30 years. Theoretical developments, empirical studies and practical utilization have contributed to give it a solid scientific reputation and widespread applications in a variety of fields.

Our theme is the need to enlarge the scope and utilization of forecasting. We aim to improve its theoretical foundations, increase its practical usefulness and close the gap between the theory and practice of forecasting.

The papers to be presented during the symposium cover most disciplines and applications. They are of an impressive standard and, as usual, a selection of them will be published in the International Journal of Forecasting. In addition to formal presentations, one of the greatest pleasures of participating is the opportunity for academics and practitioners from all over the world to meet and exchange ideas.

I would like to thank all the people who have made ISF 86 a reality. In addition, my special thanks to the keynote and other speakers for their willingness to contribute.

I hope that you will find ISF 86 an exciting and informative place. Enjoy Paris and our social events.

I hope you will also be able to join us next year in Boston.

Spyros Makridakis
Research Professor
INSEAD
Bld de Constance
77305 Fontainebleau
France

Message de bienvenue

Le 6ème Symposium marque la poursuite et l'accélération de l'ouverture de la communauté des spécialistes de la prévision aux sciences sociales et politiques.

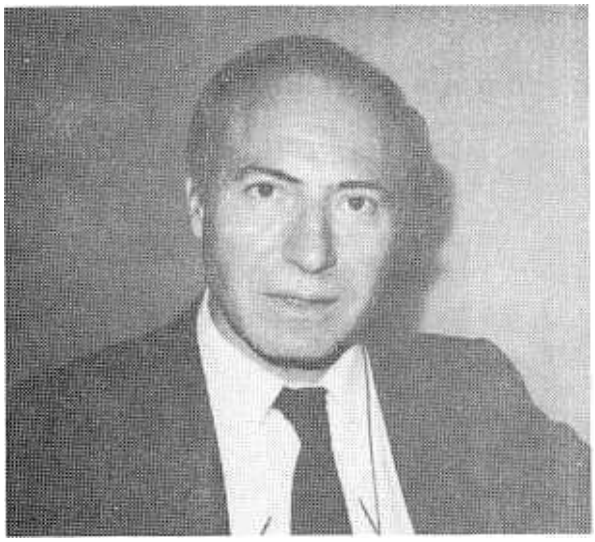
Phénomènes électoraux, relations internationales, comportements collectifs de consommation, modes de gestion publique, fonctionnement et développement des organisations : la liste est longue des apports de ces disciplines. La plus-value attendue est aussi méthodologique : les données sociales modifient radicalement le raisonnement pour la décision, pour l'entreprise comme pour les pouvoirs publics. Enfin, les sciences sociales et politiques obligent les spécialistes de la prévision à des révisions fondamentales de leur paradigme de l'action.

Connaître mieux la réalité pour agir moins aveuglément : le "Challenge" du Symposium de Paris est aussi de faire éclater quelques vérités reçues, pour obliger le prévisionniste et ses clients à prendre en compte la complexité du social, au niveau micro comme au niveau macro.

Jean-Claude THOENIG
Directeur de Recherches au CNRS
(Groupe d'Analyse des Politiques Publiques, Paris) et INSEAD

Message de bienvenue de

Maurice DESPLAS



Program Chairperson/Président du Comité de Programme

Les précédents Colloques sur la Prévision ont réuni beaucoup de personnes à des titres divers : leur compétence académique, leur qualification professionnelle en tant qu'utilisateurs de la Prévision, quelquefois la simple curiosité pour certains néophytes dont la motivation était le souhait de ne pas rester ignorants d'une discipline qui s'est rapidement développée et répandue dans des domaines de plus en plus divers.

Je crois savoir que les Congrès de Philadelphie, Londres et Montréal - pour ne citer que les derniers - ont reçu un accueil favorable de tous leurs participants, et c'est la raison pour laquelle l'organisation et les thèmes de la Conférence de Paris seront un peu du même type, avec une double spécificité cependant. Nous souhaitons d'une part que le thème que nous avions initialement retenu "l'élargissement du domaine et des utilisations de la Prévision" permette d'apporter les plus récents développements, théoriques ou appliqués, dans l'état de l'art. Nous avons d'autre part consacré nos efforts pour ouvrir davantage le domaine de la Prévision aux pays européens et en particulier au pays d'accueil de la Conférence : nous avons encouragé les auteurs à donner en français le plus grand nombre possible de leurs communications, nous avons édité aussi en français (et en anglais) la plaquette annonce, et nous assurerons le plus grand nombre possible de traductions simultanées. Ce sera là la principale nouveauté de ce 6ème Colloque International de Prévision. Tous mes voeux sont que cela vous agrée assez pour que cela puisse se renouveler dans des Conférences ultérieures.

Je tiens à remercier ici, au nom du Comité de Programme du Colloque, toutes les personnes et institutions qui nous ont aidés, et selon la tradition, il va sans dire que nous sommes seuls responsables des imperfections que vous aurez constatées dans l'organisation.

Bienvenue à vous tous, et fasse le Ciel que vous repartiez satisfaits ....

Maurice Desplas
Professeur à l'Université de Droit
d'Economie et de Sciences Sociales de Paris
(Paris - 2)

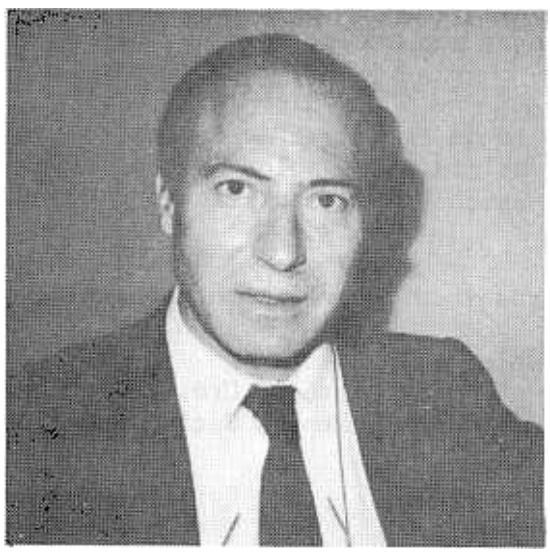
C O M I T E D'O R G A N I S A T I O N

O R G A N I Z I N G C O M M I T T E E

Spyros MAKRIDAKIS

Jean-Claude THOENIG

Organisateurs Généraux / General Chairpersons



Maurice DESPLAS
Président du Comité de Programme
Program Chairperson

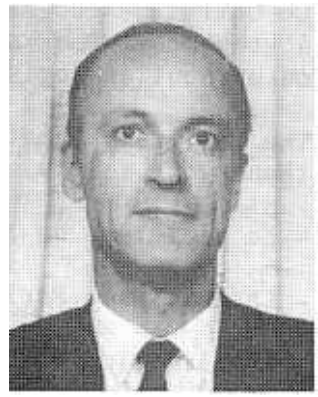
Une partie du Comité
de programme

Alain CHEVALIER

Nicolas CURIEN

Michel GODET

Jean-Pierre INDJEHAGOPIAN



Jean-Claude MILLERON

Alain MONFORT

Alain THOMAZO

REMERCIEMENTS / ACKNOWLEDGEMENTS

Le Comité de Programme du 6ème Colloque International sur la Prévision tient à remercier les institutions suivantes qui ont apporté un soutien financier ou un soutien logistique ou offert des réceptions:

The Program Committee of the 6th International Symposium on Forecasting thanks the following institutions for their financial or logistical support:

- Le Ministère de la Recherche et des Universités.
- La Mairie de Paris.
- La Direction Générale des Télécommunications
- Le Sénat.
- L'Institut Européen d'Administration des Affaires (INSEAD).
- L'Université de Droit, d'Economie et des Sciences Sociales de Paris (Paris-2).
- La Banque Paribas
- La Direction de la Prévision.
- La Fondation Nationale pour l'Enseignement de la Gestion (FNEGE).

INFORMATIONS A TOUS LES PARTICIPANTS

ENREGISTREMENT/INSCRIPTIONS:

Comptoir situé au Niveau A, avant d'arriver aux stands d'exposition. On y trouve en particulier une messagerie: un panneau comportera les messages à l'intention des participants, ainsi que toute modification de dernière heure du programme du colloque.

SECRETARIAT DU COLLOQUE:

Le secrétariat du colloque occupe le salon Van Dongen (Niveau A).

MICRO-ORDINATEURS:

Plusieurs micro-ordinateurs sont gratuitement à la disposition des conférenciers qui souhaiteraient utiliser des logiciels pour leurs communications: on peut les obtenir en s'adressant à Maine A (Niveau A).

PHOTOCOPIES

Un service de photocopie se trouve à Maine B: la duplication s'effectue sur la base de 0.50 F par copie. La plupart des papiers présentés au colloque peuvent ainsi être dupliqués à Maine B, (Niveau A).

EXEMPLAIRES SUPPLEMENTAIRES DU PROGRAMME

On peut obtenir à Maine A des copies supplémentaires du programme au prix de 50 F. Après le colloque, les exemplaires supplémentaires peuvent s'acquérir, en écrivant à l'adresse suivante: International Institute of Forecasters, INSEAD, Boulevard de Constance 77305 Fontainebleau, France, en envoyant un chèque de 70 F (port compris) à l'ordre de International Institute of Forecasters.

PAUSES CAFE:

Café, thé et boissons non alcoolisées sont disponibles. On les trouvera en allant vers les stands d'exposition et les Salles Utrillo 1 à 5.

RESTAURATION:

Les déjeuners sont inclus dans les frais d'inscription et vous avez reçu les tickets correspondants dans le dossier qui vous est remis à votre arrivée. Les déjeuners sont servis au Restaurant aux heures suivantes:

Petit déjeuner : 16, 17, et 18 Juin de 7h30 à 8h30

Déjeuner : 16 et 17 Juin de 12h15 à 13h40

IMPORTANT: N'OUBLIEZ PAS D'APPORTER VOS TICKETS A L'ENTREE DU RESTAURANT

De plus on peut acquérir des tickets supplémentaire pour les conjoints ou toutes personnes accompagnant les participants, bien entendu dans la limite des places disponibles.

RECEPTIONS ET FESTIVITES:

Les réceptions et festivités suivantes sont à l'intention des participants inscrits au programme de trois journées:

Dimanche soir: réception de bienvenue (Hôtel Montparnasse Park à 19h45)

Lundi soir: réception à l'Hôtel de Ville de Paris à 18h

Mardi soir: dîner sur la Seine (Bateau-Mouche) à 19h45

La réception à l'Hôtel de Ville est offerte par le Maire de Paris à tous les participants ainsi qu'à leurs conjoints et leurs accompagnateurs. Ces derniers peuvent acquérir des tickets (Salon Van Dongen) pour les manifestations du Dimanche soir et Mardi soir (toujours dans la limite des places disponibles). Il en est de même des personnes qui se sont inscrites pour une journée (ou deux) et qui n'ont pas de tickets dans leur dossier.

INFORMATIONS TOURISTIQUES:

Le dossier qui vous a été remis comporte un document de l'Office du Tourisme de Paris. De plus une personne pouvra vous aider pour préparer vos visites de Paris. Cette personne pouvra aussi effectuer vos réservations ou changements de billets d'avions.

STANDS D'EXPOSITION:

Ces stands se trouvent entre les salles de conférence: vous les trouverez en allant de Monparnasse ABC à UTRILLO 1,2,3,4,5. Les stands peuvent se visiter aux horaires suivants:

Dimanche 15 Juin de 19h45 à 22h00

Lundi 16 Juin de 10h00 à 18h00

Mardi 17 Juin de 10h00 à 18h00

Mercredi 18 Juin de 10h00 à 13h00

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Mercredi 18 Juin de 10h00 à 13h00

IMPORTANT INFORMATION

REGISTRATION/INFORMATION

The registration and information desk is located on level A of the conference facilities, just before the Exhibit Hall. Program information and changes will be posted up next to the registration desk, and messages for participants can also be left here.

CONFERENCE OFFICE

The conference office is located in the Van Dongen Room (Level A).

MICROCOMPUTERS

Several microcomputers are available free of charge for participants wishing to demonstrate the use of computer programs. They are located in Maine A on Level A of the conference hall.

COPYING SERVICES

Copying services are available in room Maine B (level A). Duplicating costs are 0.50F per copy. Most papers presented at the Symposium are available at the copying center for those who wish to have a copy made.

ADDITIONAL COPIES OF PROGRAM BOOK

Additional copies of the ISF86 Program are available at the Conference Office (Van Dongen Room) at a cost of 50F. After the Symposium, additional copies may be acquired by writing directly to The International Institute of Forecasters, INSEAD, Bd. de Constance, 77305, Fontainebleau, France. Please include a cheque for 70F (includes postage) made payable to The International Institute of Forecasters.

COFFEE BREAKS

Coffee, tea and soft drinks will be available outside the Exhibit Hall and other locations in the mid-morning and mid-afternoon breaks on all three days of the Symposium.

MEALS

The following meals are included for those registered:

Lunch June 16 and 17, 1986
Hotel Restaurant from 12:15 to 13:40

Breakfast, June 16-17-18, 1986
Hotel Restaurant from 7:30 to 8:30

IMPORTANT : REMEMBER TO BRING YOUR MEAL TICKETS

STAND D'EXPOSITION / EXHIBITORS

LES EXPOSANTS PAR ORDRE ALPHABETIQUE SONT LES SUIVANTES:
EXHIBITORS ARE LISTED BELOW IN ALPHABETICAL ORDER:

Nom de la Société / Company Name	Adresse
APPLI-TECH Softwear Services	Broad Oak, Accrington BB5 2DJ, G.B.
APPLIED DECISION SYSTEMS	33 Hayden Av. Lexington, MASS 02173, USA
BUSINESS COMPUTER SYSTEMS (BCS)	91 rue du Fauborng Saint Honoré 75008 Paris, FRANCE
B.I.P.E	122 Avenue Charles de Gaulle 92522 Neuilly sur Seine, FRANCE
CHASE ECONOMETRICS	Avenue des Arts 52 B-1040 Bruxelles, BELGIUM
CISI-WHARTON	35 Boulevard Brune 75680 Paris, Cedex 14, FRANCE
CONCEPTEL	37 rue des Acaciss 75017 Paris, FRANCE
CORE ANALYTIC	674 Route 202-206 North Bridgewater, New Jersey 08807, USA
DATAMEDIA	Bernadottestrasse 10 D-2000 Hambourg 50, GERMANY
DRI-Europe Inc	13 rue du 4 Septembre 75002 Paris, FRANCE
FUTURIBLES	55 rue de Varenne 75007 Paris, FRANCE
G. JENKINS & PARTNERS Ltd	Parkfield Greaves Road, Lancaster LA1 4TZ, G.B.

HUDSON RESEARCH International Ltd	1 bis Avenue de Lowendal 75007 Paris, FRANCE
INTERNATIONAL INSTITUTE OF FORECASTERS	INSEAD, Bd. de Constance, 77305 Fontainebleau, FRANCE
LINCOLN SYSTEMS	P.O. Box 391 Westford, MA 01886 USA
MARKETING SYSTEMS	Postfach 23 01 09 Hungrückstrasse 9a D-4300 Essen 1, GERMANY
ELSEVIER SCIENCE PUBLISHERS	P.O. BOX 1991 1000 BZ Amsterdam HOLLAND
O.F.C.E.	69 Quai d'Orsay 75007 Paris, FRANCE
OFFILIB	48, Rue Gay Lussac 75005 Paris, France
SCIENTIFIC SYSTEMS, Inc	54 Cambridge Park, Cambridge, MASS, 02140, USA
TIMBERLAKE CLARK Ltd	THE UNITED KINGDOM
TOP INFORMATIQUE	1 Boulevard Ney 75018 Paris, FRANCE

Planning (résumé) des Sessions Spéciales
Summary (schedule) of Plenary Sessions

DIMANCHE 19.00 à 19.45 / SUNDAY 7:00 to 7:45 pm
Session Plénière/Keynote Speach

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Montparnasse A	Politique Scientifique et Prévision Scientific Policies and Forecasting	H. CURIEN	17

LUNDI 13.45 à 14.40 / MONDAY 1.45 to 2:40 pm
Sessions Plénières/Keynote Speaches

Montparnasse A	Analyse et prévisions Analysis and Forecasting	E. MALINVAUD	18
Montparnasse B	Intervalles de prédiction Predictive Intervals	R. WINKLER	19
Montparnasse C	Mise à jour des préferences Updating of Beliefs	R. HOGARTH	20

LUNDI 16.45 à 17.45 / MONDAY 4.45 to 5.45
Conférences Spéciales et Tables Rondes/Feature Speakers and Panels

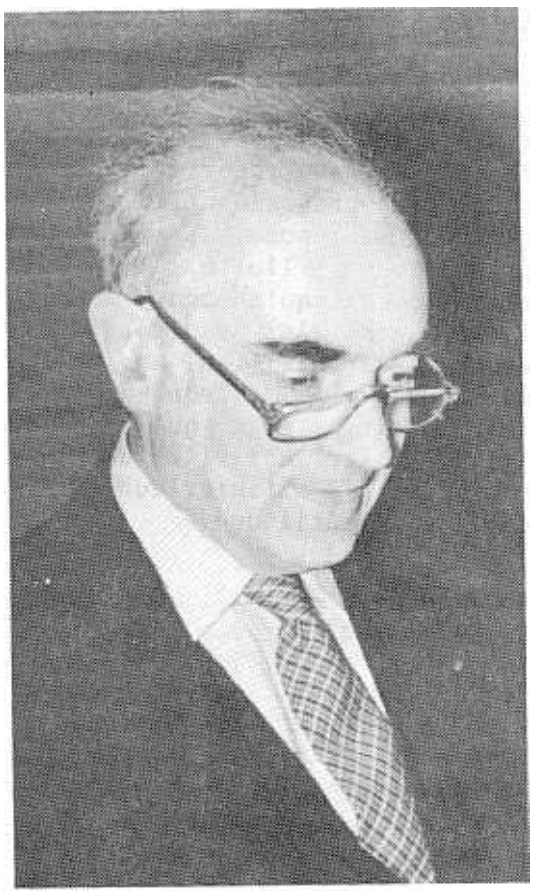
Montparnasse A	Systèmes de prévision en Europe Forecasting System in Europe	R. LEWANDOWSKI	21
Montparnasse B	Prévision et planification Forecasting and Planning	R. DEROECK	22
Montparnasse C	La Prédiction et ses limites Limits of Predictability	R. DOKTOR	23
Gaite A	Haute technologie et prévision Forecasting High Technology	F. LAGAE	24
Gaite B	Validation empirique de la Prévision Forecasting: Empirical Evidence	S. SCHNAARS	25
Gaite C	Etude de la prévision economique Economic Outlook Survey	V. ZARNOVITZ	26
Utrillo 1	Prévision en démographie Demographic Forecasting	D AHLBURG	27
Utrillo 2	Prévisions du court au long terme From Short to Long Term Forecasts	E. FONTELLA J. PAELINCK	28

Traduction simultanée/Simultaneous translation:
Montparnasse A, B, C et Gaite A

Hubert Curien, Universités Pierre et Marie Curie
(Paris VI) et Paris VII
Tour 16, 4 Place Jussieu
75252 Paris Cedex 05

Agrégé des sciences, Docteur ès sciences. Professeur à la faculté des sciences de Paris, Directeur scientifique puis Directeur général (1969-1973) du Centre national de la recherche scientifique (C.N.R.S.), Délégué général à la recherche scientifique et technique (1973-1976). Président du conseil d'administration du Centre National des études spatiales (C.N.E.S.) Membre du conseil d'administration du Bureau de recherches géologiques et minières. Membre du Haut Comité pour la défense et l'expansion de la langue française (1969-1973), membre du conseil d'administration de l'Ecole polytechnique (1971-1976) et du conseil d'administration de l'Onera (1972-1973). Président du conseil d'administration de l'Institut de biologie physico-chimique (Fondation E. de Rothschild). Président du Palais de la Découverte (1977), Président de la Fondation européenne de la science, Président du conseil scientifique de l'Institut national de recherche en informatique et automatique, Président du Conseil de l'Agence spatiale européenne (A.S.E.), Président du Comité académique des applications de la science. Vice-président de l'académie internationale d'astronautique. Vice-président du Comité européen de développement de la science et de la technologie CEE, Bruxelles (1983). Ministre de la Recherche et de la Technologie (1984-1986).

"POLITIQUE SCIENTIFIQUE ET PREVISION"



La recherche et le développement technologique, qui justifient en France une dépense annuelle supérieure à cent milliards de francs, exigent que l'on définisse une politique scientifique ferme et continue. Le fait que la recherche soit essentiellement aléatoire dans ses résultats ne défie pas la prévision: il en fait simplement un exercice particulier. Plus la recherche est proche des applications moins il est, d'ailleurs, acrobatique d'en prévoir les issues et les besoins, mais plus il est impérieux d'impliquer les facteurs économiques. Les grands programmes nucléaires, aéronautiques, spatiaux ont des résonances internationales fortes, mais, plus généralement, il n'est aucun développement technologique, ni même aucune recherche fondamentale de quelque ampleur, qui puissent être conçus et menés utilement, en dehors des courants internationaux. C'est en organisant la circulation des idées et des hommes que nous pouvons espérer, nous français, qui élaborons un peu moins du diximème de la science et de la technologie mondiale, faire fructifier au mieux notre mise.

Président: Maurice DESPLAS, Dept. Info., Univ. de Paris 2, 92 rue d'Assas, 75006 Paris.

Edmond Malinvaud, Directeur Général
INSEE
18 Bld. Adolphe Pinard
75675 Paris Cedex 14

Ancien élève de l'Ecole polytechnique, Licencié en droit. Chercheur à la Cowles Foundation for Research in Economics à Chicago (1951). Professeur à l'université de Californie de Berkeley (1961 et 1967), Directeur de l'Ecole nationale de la statistique et de l'administration économique (1962-1966). Inspecteur général (1966) puis Directeur général (depuis 1974) de l'Institut national de la statistique et des études économiques, Président de la Société internationale d'économétrie (1963). Président (1974) de la Société de statistique de Paris. Directeur de la prévision au ministère de l'Economie et des Finances (1972-1974). Président de l'Association internationale des sciences économiques (1974-1977), Président de l'Institut international de statistiques (1979-1981). Oeuvres: **Initiation à la comptabilité nationale** (1957, 1961, 1964), **Méthodes statistiques de l'économétrie** (1964, 1969, 1978, 1981), **Leçons de théorie micro-économique** (1969, 1971, 1975, 1982), **la Croissance française** (1972), **Réexamen de la théorie du chômage** (1980), **Théorie macroéconomique** (1981), **Essais sur la théorie du chômage** (1983).

"ANALYSE ET PREVISION : LEURS ROLES RESPECTIFS DANS LA MAITRISE DE NOS DESTINS"

On ne dira jamais trop que l'analyse fouillée des phénomènes est la véritable source des progrès dans l'art de la prévision. Centré autour de cette proposition, l'exposé comprend trois parties. (1) La prévision est rarement efficace sans théorie. Ainsi la méthodologie prévisionnelle, en tant que discipline autonome, a un domaine d'application limité. (2) La modélisation, requise pour la prévision, est elle-même le résultat d'un long processus d'acquisition analytique des connaissances. (3) Puisque prévisions il y a, parfois plus qu'il ne serait légitime, cette activité devrait être disciplinée, à l'intérieur de chaque discipline scientifique.

Président Maurice DESPLAS, Dept. Info., Univ. de Paris 2 92 rue d'Assas, 75006 Paris.

Dr. Robert Winkler, Research Professor
Duke University
The Fuqua School of Business
Durham, North Carolina 27706
USA

Robert L. Winkler is Calvin Bryce Hoover Professor in the Fuqua School of Business at Duke University, Durham, NC 27706. He received a B.S. from the University of Illinois and a Ph.D. from the University of Chicago. Prior to joining the Duke faculty in 1984, Professor Winkler served as Distinguished Professor of Quantitative Business Analysis at Indiana University, and he has held visiting positions at the University of Washington, the International Institute for Applied Systems Analysis, Stanford University, and INSEAD. His primary research interests involve probability forecasting, combining forecasts, Bayesian inference, decision analysis, and risk assessment. He is Departmental Editor for Decision Analysis for **Management Science**, a Director of the International Institute of Forecasters, serves on the editorial boards of several other journals, and is a consultant to various organizations.

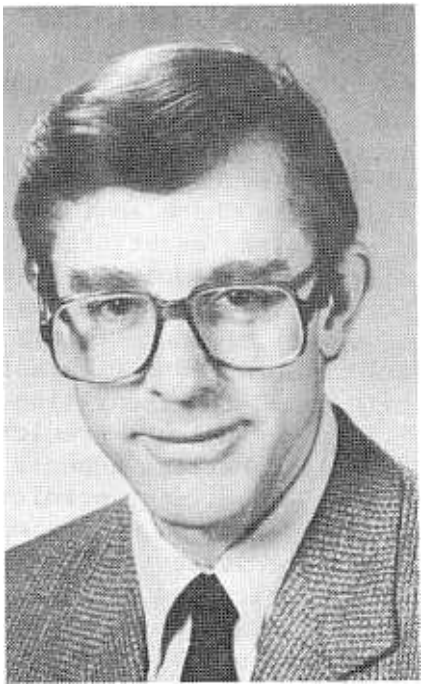
"PREDICTIVE INTERVALS IN FORECASTING"

Much attention in forecasting is focused on generating point forecasts. The degree of uncertainty about future values of a time series varies considerably, and this uncertainty can have an important bearing on the risk associated with decisions related to forecasts of these future values. Thus, attempting to measure the degree of uncertainty can provide useful information. This talk will deal with the representation of uncertainty in terms of predictive intervals. Some theoretical aspects and empirical results involving predictive intervals will be presented. The impact of certain characteristics of a series (such as nonstationarity and cyclicality) will be examined, and suggestions for future work will be discussed.

Chair: Nicolas Curien, Direction Générale des Télécommunications, Tour Maine Montparnasse, 33 Avenue du Maine, 75755 Paris Cedex 15

Dr. Robin M. Hogarth, Professor of Behavioral Science
University of Chicago
Graduate School of Business
1101 East 58th Street
Chicago, Illinois 60637
USA

Robin M. Hogarth is Professor of Behavioral Science, and Director of the Center for Decision Research at the University of Chicago's Graduate School of Business. He previously held appointments at INSEAD (Fontainebleau, France) and the London Business School (U.K.). His research centers on the psychology of judgment and decision making processes and, in particular, issues related to causal reasoning and the assessment of uncertainty. He has published three books (including **Judgement and Choice**, Wiley, 1980) as well as many articles in leading professional journals.



"THE UPDATING OF BELIEFS: A PSYCHOLOGICAL ANALYSIS"

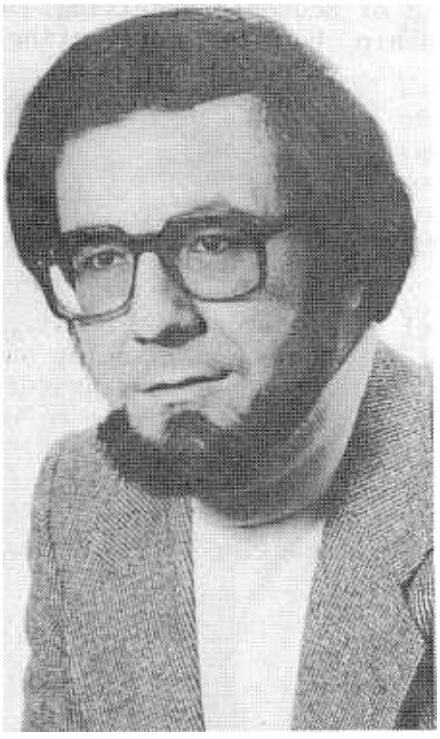
The existence of effects due to the order in which information is processed has long been recognized in situations where people update beliefs (e.g., judgmental forecasts) over time. Moreover, empirical research on this topic has produced many complex and conflicting results. In some areas of research, reports of primacy (where information at the outset of a series is weighted more heavily than later information) have predominated; in others, recency is the principal finding. This paper presents a psychological model of the updating process that both accounts for existing empirical phenomena and leads to new predictions concerning the updating process. The model assumes a sequential anchoring-and-adjustment process where people evaluate evidence that has been previously encoded as positive or negative vis-à-vis the hypothesis. The evaluation of evidence reflects both a contrast from the anchor (i.e., the current position) and the person's attitudes toward positive and/or negative evidence. More specifically, the adjustment weight for negative evidence is proportional to the anchor, whereas the weight for positive evidence is inversely proportional. The constants of proportionality reflect attitudes toward negative and positive evidence, respectively. These attitudes, in turn, reflect the costs of over- and/or underreacting to negative and positive evidence. In addition to synthesizing a wide variety of empirical evidence, some additional experimental results are presented together with speculations on implications for broader issues in judgmental forecasting.

Chair: Robert Fildes, Professor, Manchester Business School, Booth Street West, Manchester M15 6PB, England.

Rudolf Lewandowski, Director
Marketing Systems
Hunsrückstr. 9a
D - 4300 Essen 1 Bredeney
West Germany

Doctorat de mathématiques et d'économie. Directeur du service de recherche opérationnelle d'une grande société internationale (1965 à 1968). Directeur de l'Institut de Mathématiques et d'Informatique Appliquée (MBP) en Allemagne (1968 à 1972). Fondateur et directeur de la société Marketing Systems, créée en 1973. Auteur d'une dizaine de livres sur la prévision. Plusieurs centaines de publications sur la prévision, la planification et la recherche operationnelle. Mise au point de plusieurs centaines de systèmes opérationnels de prévision utilisés par des entreprises internationales. Créateur de sytèmes prévisionnels de renommée internationale (FORSYS et MARKET). Cours de prévision dans une vingtaine d'universités et écoles de management en Europe. Membre actif dans de multiples associations scientifiques et professionnelles.

"BILAN CRITIQUE DE L'UTILISATION DES SYSTEMES PREVISIONNELS EN EUROPE"



La prévision est une des bases fondamentales de réduction des coûts dans la grande majorité des entreprises. Voici ci-dessous nos estimations sur les gains en productivité induits par une bonne prévision:

. 20% dans le risque d'investissement
. 20% dans la gestion des stocks
. 20% dans la logistique et la distribution
. 15% dans la gestion de la production
. 15% dans les dépenses marketing
. 10% dans les dépenses financières
. 10% dans les achats de matières premières
. 10% dans les coûts de personnel

Pourtant, on utilise peu les systèmes de prévision en Europe pour les raisons suivantes:

. Incrédulité du management face à la prévision par les systèmes
. Complexité de la méthode
. Manque d'une organisation adéquate
. Manque de ressources

L'expérience nous permet de dégager un certain nombre de règles:

. La mise en place des prévisions doit être systématiquement planifiée et gérée.
. La prévision doit être intégrée dans la hiérarchie.
. La technique prévisionnelle doit être adaptée aux spécifications de l'utilisateur.
. La continuité de l'utilisation doit être assurée.

Président: Maurice DESPLAS, Dept. Info., Univ. de Paris 2, 92 rue d'Assas, 75006 Paris.

Chairperson: **Mr. Richard De Roeck**, Director, International Economic and Automotive Forecasting and Analysis Group
General Motors Corporation
General Motors Building
767 Fifth Avenue
New York, N.Y. 10153
USA

Participants: **Bernard Herman**, Chase Econometrics, 52 Avenue des Arts, 1040 Bruxelles, Belgium
Bernard Majani, Societe Aussedat-Rey, B.P. 05, 78141 Vellizy-Villacoublay, France
Spyros Makridakis, Professor, INSEAD, Boulevard de Constance, Fontainebleau, France

Richard De Roeck is Director of the International Economic and Automotive Forecasting and Analysis Group of the General Motors Corporation. In this capacity, he is responsible for the analysis and forecast of the international business environment as it pertains to the operations of General Motors around the world both in actual and potential markets.

Mr. De Roeck is an Associate Editor of the **International Journal of Forecasting** and is also on the Editorial Board of **Economic Modelling**. He is particularly interested in the relationship between forecasting and strategic planning.

"FORECASTING FOR PLANNING AND STRATEGY"

This panel will discuss the relationship between forecasting and planning and how forecasts can be bestly integrated into the planning process. The role of uncertainty in forecasting and its implications on planning and strategy as well as psychological and political aspects of forecasting and planning will be explored.

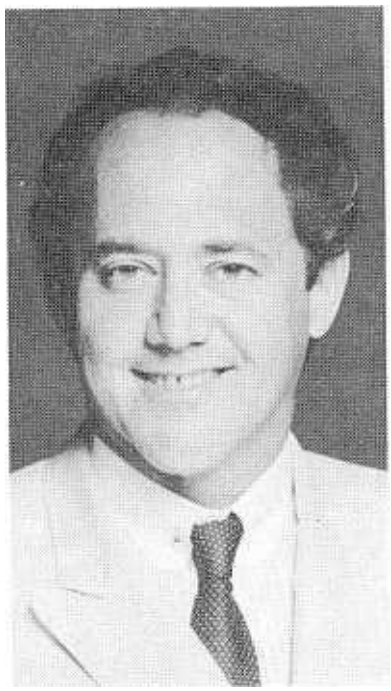
Dr. Robert Doktor, Professor
University of Hawaii at Manoa
College of Business Administration
2404 Maile Way
Honolulu, Hawaii 96822
USA

Robert Doktor received his Ph.D. from Stanford University in organizational behavior. Prior to joining the faculty at the University of Hawaii, he served as assistant professor at the Wharton School of Business, University of Pennsylvania and as director of Graduate Business Programs at State University of New York, Binghamton. He also held visiting appointments at Harvard University, The International Institute of Management in Berlin, Aoyama Gaukin University in Tokyo.

and **Susan M. Chandler**, Associate Professor
University of Hawaii

Susan Meyer Chandler received her doctorate from the University of California at Berkeley. Prior to her position as Associate Professor at the University of Hawaii she held faculty post at the University of California at Berkeley. She is the author of numerous journal articles and book chapters concerned with social policy implementation and evaluation. She has served as a consultant to numerous social agencies, both in the State of Hawaii and the Continental United States.

"LIMITS OF PREDICTABLILTY OF GOAL DIRECTED BEHAVIOR IN ORGANIZATIONS"



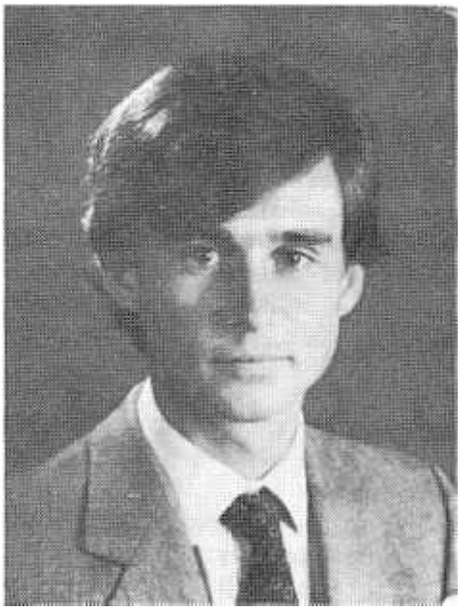
The purpose of this paper is to engender discussion of a somewhat novel approach toward understanding the nature of organization with special attention to the behavior of human organizations. Traditionally, we are taught that human organizations exist so that their members may pursue common goals which are more easily accomplished as a collectivity than as an individual. Further, the existence of the organization in and of itself becomes a commonly held goal, and we note the emergence of the notion of the survival or stability (sometimes "dynamic stability") of the organization as becoming a primary organizational goal.

We shall propose that stability and survival of organizations are a consequence of the pattern of their connectiveness. Further, one is as accurate in viewing the pattern of connectiveness as the determination of the goal directed behavior of an organization as is one who takes the more traditional "form follows function" approach. The emphasis is on the overriding importance of patterns of interaction in the determination of the goals of human organization. In arguing the point we will emphasize the organizational goal of survival or stability as an illustration of our point of view.

Chair: Spyros Makridakis, Research Professor, INSEAD, Bld de Constance, 77305 Fontainebleau.

Chairperson: **François Lagae**, Business & Forecasting Analyst, Hewlett-Packard S.A. 150 Rte du Nant-d'Avril P.O. Box CH-1217 Mayrin 2 Geneva Switzerland

Participants: **Theodore Modis**, Management Science, Digital Equipment Corporation, 65 Chemin de l'Etang, 1219 Geneva, Switzerland
Janice Wojnor, Bell Communication Research, 290 Mount Pleasant Ave, USA, Livingson N.J. 07039



"FORECASTING THE DEMAND FOR HIGH TECHNOLOGY PRODUCTS"

Forecasting high technology products is a unique activity. Usually there is little or no history; their life cycle is short, while competition is keen. On the other hand, production planning requires forecasts several months in advance which necessitates a process to obtain them. This panel will discuss how these forecasts can be made, and how uncertainty can be incorporated into the planning process.

LUNDI
17.45

GATE B

MONDAY
4:45 - 5:45 pm

Dr. Steven P. Schnaars, Associate Professor of Marketing
Baruch College
The City University of New York
17 Lexington Avenue
New York, NY 10010
USA

Steven P. Schnaars is Associate Professor of Marketing at Baruch College in New York City. He received a Ph.D. in Marketing from the Graduate Center of The City University of New York in 1982. His research interests center on sales and market forecasting. Specific interests include the identification of growth market opportunities, evaluations of forecasting models, and scenario analysis. His articles have appeared in **Journal of Marketing Research, Journal of Business Research, International Journal of Forecasting, Long-Range Planning** and **California Management Review.** He is currently North and South American Book Review Editor for the **International Journal of Forecasting.**

"IMPLICATIONS OF EMPIRICAL EVIDENCE ON THE THEORY AND PRACTICE OF FORECASTING"

Empirical evidence is often at odds with the theory and practice of forecasting. What theory has argued (or strongly implied) is the best means of obtaining more accurate forecasts has not been supported by empirical research. This paper summarizes the empirical evidence on the performance of forecasting models. It details how these findings conflict with prevalent theories, and offers alternative perspectives that may be more consistent with the findings of empirical research. This paper argues that the practice of forecasting would be better served by taking a fresh look at many popular theories of forecasting in light of the mounting empirical evidence against them.

Chair: Robert Winkler, Duke University, Fuqua School of Business, Durham NC 27706, USA.

Chair : **Victor Zarnowitz,** Professor
Graduate School of Business
University of Chicago
1101, 58th Street
Chicago, Illinois 60637
USA

Details to be announced.

TABLE RONDE / PANEL

Dr. Dennis A. Ahlburg, Associate Professor
University of Minnesota
Industrial Relations Center
537 Management and Economics Building
271 19th Avenue South
Minneapolis, Minnesota 55455
USA

Dennis A. Ahlburg is Associate Professor of Industrial Relations at the University of Minnesota. He received a B.Ec. (Honors) from the University of Sydney in 1972, a M.Ec. from the Australian National University in 1973, and a Ph.D. in Economics from the University of Pennsylvania in 1979. His current research interest is economic-demographic models of developed and developing nations. He has published recently in **Demography, Journal of Forecasting, Social Biology, International Journal of Forecasting,** and **Journal of Labor Research.** He recently contributed the chapter on Population Forecasting to Makridakis and Wheelwrights' **Handbook of Forecasting.**

"DEMOGRAPHIC FORECASTING"

This presentation will discuss the use of time series and econometric models in addition to traditional cohort-component approaches in demographic forecasting. The forecast accuracy of these approaches will be compared as will their usefulness to consumers of demographic forecasts. The contribution of demographic forecasting to economic forecasting will also be considered.

Chair: Scott Armstrong, Wharton School, University of Pennsylvania, Philadelphia PA 19104, USA.

Chairpersons: **Dr. J.H.P. Paelinck** Professeur
Erasmus Universiteit Rotterdam
Postbus 1738
3000 DR Rotterdam
The Netherlands

Dr. Emilio Fontela, Professor
University of Geneva ASEPLLT
7, Place Longemalle
1204 Geneva Switzerland

Participants: **Mr. Raymond Courbis**, Centre National de la Recherche Scientifique, Université de Paris-X-Nanterre
Camilo Dagum, University of Ottawa, Ottawa, Canada
Antonio Pulido, University of Madrid, Professor of the Centro de Predictioccion Economie, Spain

Jean Paelinck est actuellement professeur d'Economie Spatiale Théorique à l'Université Erasme de Rotterdam; il a publié comme (co)-auteur ou (co)-éditeur une quarantaine d'ouvrages et près de deux cent cinquante articles. Il a enseigné entre autres, en France à Aix-en-Provence, Dijon, Lille, Paris, en Belgique à Louvain et Namur, en Angleterre à Bristol et Canterbury, aux Etats-Unis au Massachusetts Institute of Technology, au Canada à Moncton, Montréal et Québec, au Vénézuéla à Caracas, en Columbie à Bogota ...

Il est docteur honoris causa de l'Université de Poitiers.

Emilo Fontela is professor at the University of Geneva and the University of Madrid; President of the European Association of Applied Economics (ASEPELT); Honorary professor of the Institute of Business Administration and Management of Tokyo.

"THE ADAPTATION OF SHORT-TERM MACROECONOMIC MODELS FOR LONGER-TERM EXPLORATION"

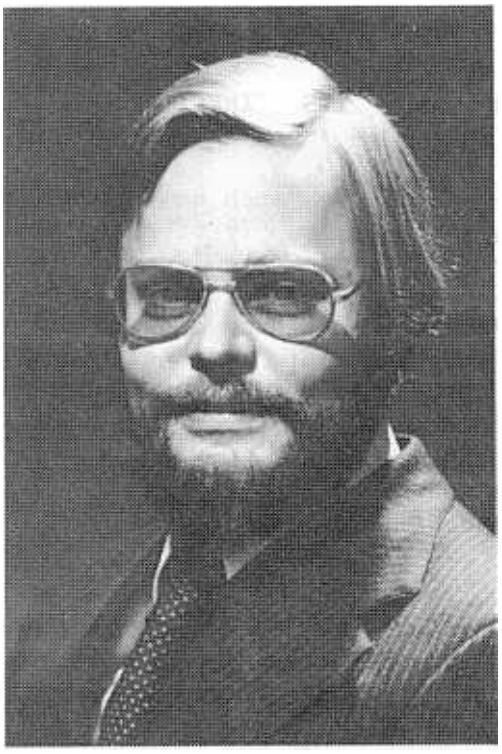
The existing macroeconomic models are demand orientated (Keynesian or monetarist) and are generally built for the purpose of short term forecasting, or for simulation of policies and external shocks, always with relatively short-term impact periods; these models usually include equations dealing with capacity utilization. The questions to be considered in this panel are related to the use of these models for medium and long term (5-10 years) exploration of growth paths :

- should some mechanisms be deleted?
- should the coefficients be changed? and how ?
- should we change the validation criteria ?
- should we build entirely different models?

TABLE RONDE / PANEL

Stephen K. McNees, Vice President and Economist
Federal Reserve Bank of Boston
600 Atlantic Avenue
Boston, MA 02106
USA

Stephen McNees is a Vice President and Economist at the Federal Reserve Bank of Boston where his responsibilities include briefing the President and the Board of Directors of the Bank on the economy and economic policy. In 1982-83, Mr. McNees served as senior staff economist for macroeconomic policy for the President's council of Economic Advisers. Mr. McNees completed his bachelor's degree at Swarthmore College and received his Ph.D. from Massachusetts Institute of Technology. Mr. McNees has taught at Harvard University, Northeastern University, and Massachusetts Institute of Technology and Williams College. He is currently an Associate Editor of the **International Journal of Forecasting** and a referee for several professional journals.



"WHY DO FORECASTS DIFFER?"

We are invariably faced with a multiplicity of different assessments of the economic future. To many, this disparity is a source of confusion and frustration. Some react by dismissing all forecasts as if there were no basis for making judgments about the future. While understandable, this response seems misguided: our problem is not that there is no basis but rather that there are too many different bases.

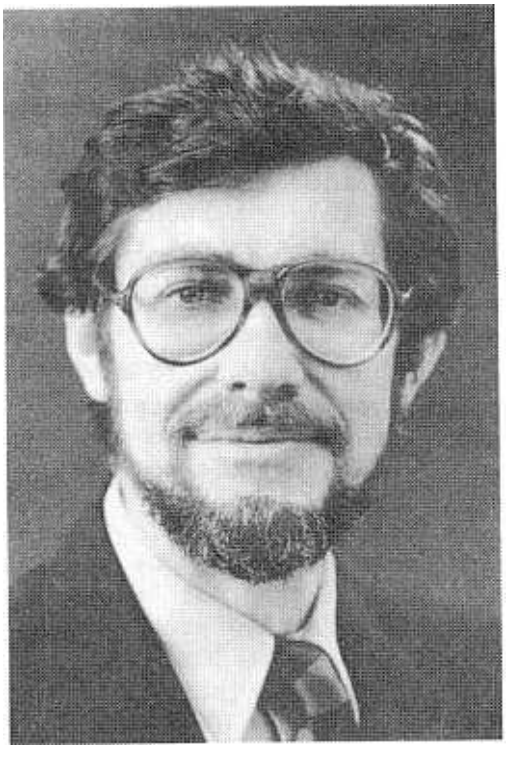
Other forecast users react to diversity by embracing a consensus forecast. This response makes sense in that no one model or forecaster has a sufficient monopoly on economic wisdom to dominate all the competition. Although it is clearly useful to consider more than one forecast or model, the practice of "averaging" forecasts also raises some problems.

One important problem is that a consensus forecast seems to take us away from addressing the fundamental question of why forecasts differ. Relatively little attention has been given to this question and very little systematic evidence is available. A serious forecast user needs to try to identify the sources of systematic differences among forecasts. He or she has to sort out why forecasts differ to be able to apply them successfully.

Alain Monfort, Institut National de la Statistique et des Etudes Economiques, 3 Avenue Pierre Larousse, 92241 Malakoff, France.

Dr. J. Scott Armstrong, Professor
Wharton School
University of Pennsylvania
Philadelphia, PA 19104
USA

J. Scott Armstrong, Ph.D. M.I.T., is an Editor of the **International Journal of Forecasting** and a Director of the International Institute of Forecasters. In addition, he is contributing editor for **Interfaces**. He has taught at the Wharton School, University of Pennsylvania, since 1968, and also at the Stockholm School of Economics, the University of Hawaii, IMEDE (Switzerland), the University of Canterbury (New Zealand) and Chulalongkorn University (Bangkok). Prior to that he worked at Eastman Kodak, Polaroid, and Xerox. He has published over 110 papers on applied statistics, survey research, social responsibility, educational methods, scientific methodology, strategic planning, and forecasting. The second edition of his book, **Long-Range Forecasting: From Crystal Ball to Computer**, was published in 1985.



"RESEARCH AND ITS IMPLICATIONS FOR FORECASTING"

Is the demand for research on forecasting increasing? Is the supply of research on forecasting meeting the demand (with respect to the amount and type of research)? What type of research should be done? Finally, what can be done to increase the value of research for practitioners? Evidence on these issues will be obtained from a survey of practitioners and researchers as well as from an analysis of the research literature.

Chair: Spyros Makridakis, Research Professor, INSEAD, Bld de Constance, 77305 Fontainebleau.

Eleanor Chelimsky, Director
U.S. General Accounting Office
Program Evaluation & Methodology Div.
Washington D.C. 20548
USA

Eleanor Chelimsky is the Director of the U.S. General Accounting Office's Program Evaluation and Methodology Division. The division serves the Congress through evaluations of government programs, the development and demonstration of methods for evaluating programs, and the provision of design and measurement assistance to other GAO divisions. Mrs. Chelimsky came to the GAO from the MITRE Corporation, where she directed the corporation's work in planning and policy analysis, criminal justice, program evaluation, and research management. From 1966-1970, Mrs. Chelimsky was an economic analyst for the United States Mission to NATO. Mrs. Chelimsky was a Fulbright Scholar in Paris. She is a member of the Editorial Review Board for the Sage Research Series in Evaluation and serves on the Editorial Boards of two journals: **Policy Studies Review** and **Policy Studies Review Annual.** She is a past president of the Evaluation Research Society and received the 1982 Myrdal Award for Government.

"EVALUATION AND FORECASTING: THEIR SIMILARITIES AND DIFFERENCES"

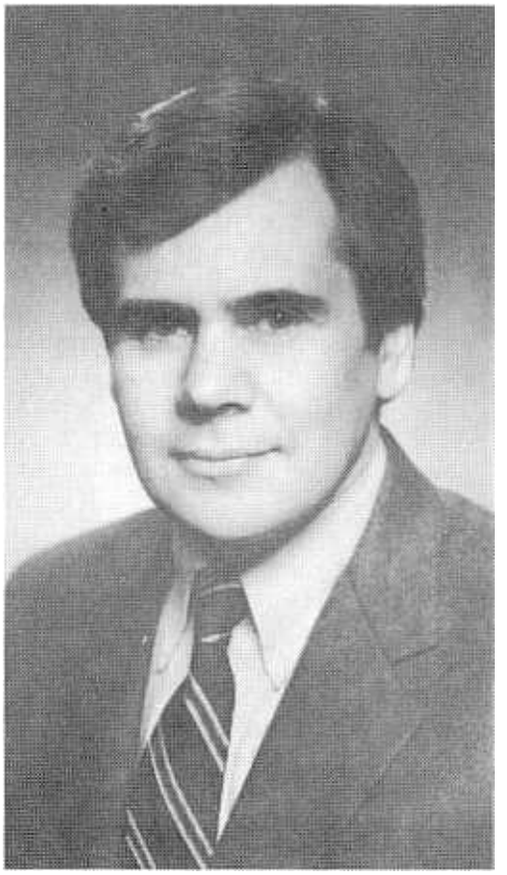
This paper raises some questions about the relationship between evaluation and forecasting. Comparing and contrasting the two fields in terms of Mindset, purpose, problems, advantages and use shows that, while their modes of inquiry are indeed very different in many ways, there is also inter-dependence between the two, as already shown by the mutual use of time series analyses.

It is argued that each can be greatly strengthened by better understanding and use of the other's techniques, for example evaluation's empirical testing and forecasting's Delphi.

President: Jean-Claude MILLERON, Direction de la Prévision, Min. des Finances, 151 bis rue de Rivoli, 75001 Paris.

John D. Paulus, Managing Director & Chief Economist
Morgan Stanley & Co. Incorporated
1251 Avenue of the Americas
New York, New York 10020

John D. Paulus, Managing Director and Chief Economist of Morgan Stanley & Co. Inc., received his bachelor's degree from the University of Michigan in 1965 and his Ph.D. from the University of Chicago in 1972. Before joining Morgan Stanley in 1982, he was Vice President and Chief Financial Economist for Goldman, Sachs & Co. He had previously worked for the Federal Reserve Bank of Minneapolis as Senior Vice President and Director of Research. He also has served on the official research staff of the Federal Reserve Board and has worked in industry as a Systems Analyst for the Ford Motor Company and General Electric.



"WHEN WILL THE NEXT RECESSION START?"

For 1986 and beyond, the outlook of the economy gets hazy and recession fears increase. Hardly anyone denies the necessity to reduce the massive budget deficits so as to improve the economy's health in the long run, although there is much disagreement on just how to do it. In the short run, however, restraining government expenditures to shrink the deficits will mean less fiscal stimulation of the economy. This may coincide with a weakening of business investment, especially if the tax reform eliminates the investment tax credit and reduces the benefits from accelerated depreciation. Lower interest rates and a weaker dollar would counteract these depressant effects, but probably only with sizable lags. And what will happen to the interest and exchange rates is itself quite uncertain. It depends, among others, on the actions of the Fed that will reflect assessments of the changing prospects for inflation, monetary velocity (how much income do the additional circulating dollars generate?), and business conditions abroad. The interactions of these and other important factors, which are particularly complex in the vicinity of major economic turning points, make any longer-term forecasts inherently difficult, hazardous and interesting.

Chair Victor Zarnowitz, Graduate School of Business, University of Chicago, 1101 58th St Chicago, Illinois 60637, USA.

Mr A.P de Geus Planning Co-ordinator
Shell International
Shell Center
London SE1 7AN
England

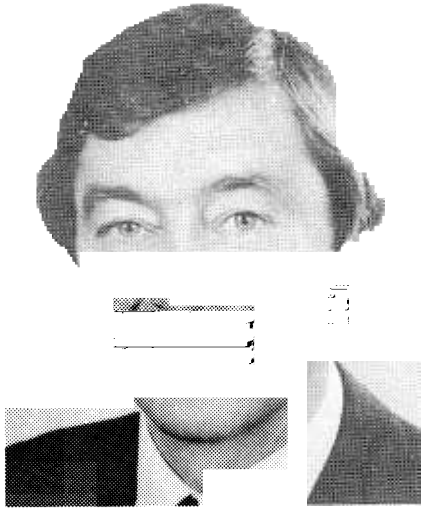
Mr. de eus was ap i Planning Co-ordina h April 1981, having
been Reg onal Co-or r Africa and South e 1st February 1978.
He became a Director on 1st January 197

He was born in Rotterdam in 1930 and was educated at Rotterdam University. He graduated as an economist and obtained a degree in business adminstration in 1955.

Mr. de Geus joined Shell Pernis in 1951 in the Accounts Department. In 1958 he became Head of the Methods and Procedures Department. Two years later he joined Bataafse Internationale Petroleum Maatschappij NV in The Hague in the Production and Economics Division.

In 1963 Mr. de Geus was appointed Finance Controller for Belgian Shell. He worked with SIPC in London from 1970 for two years as Senior Assistant in the Africa and South Asia Regional Organization. He was then transferred to Shell Brasil SA to become Finance Director and Vice-President, and was appointed Chief Executive - Oil at the beginning of 1977.

Mr. de Geus was appointed Chairman of the Netherlands-British Chamber of Commerce in 1980.



"THE CORPORATE CLASSROOM PLANNING AS LEARNING"

The prime task of the management of a corporation is to obtain growth when there is harmony with the environment. In the opposite case, when there is divergence with the environment, their main task becomes that of changing the corporation. They should do so, preferably, by foresight. If they fail, a crisis will ensue in which the corporation will either change by force or wither and die. History shows that many more die than change.

A change in the environment, away from harmony, can be either sudden or gradual. The gradual change will give time to exercise foresight. This requires that the corporation has means to measure its environment. Usually, these are plentiful. However, for the management to act on these signals and measurements it is necessary that they will see when "the writing's on the wall". Their first reaction is likely to be a marginal internal adaptation (e.g., cost cutting), or, worse, a denial of the signals.

hair Serge de Klebnikoff, Vice President de 'Association Francaise des Analystes de Risques-Pays (AFAR), France.

Président : **Pascal Mazodier**, Chef du Service de la Conjoncture
Institut National de la Statistique et des Etudes Economiques (INSEE)
18 boulevard Adolphe-Pinard
75675 Paris

Participants: **Madame Michèle Dobonneuil**, Chef de la Division Conjoncture Générale, INSEE
Monsieur Innocenzo Cipoletta, Directeur des Etudes, Confindustrial, Rome, Président de l'AIECE
Monsieur Gilles Legendre, Le Nouvel Economiste, Paris
Monsieur Gérard Maarek, Directeur des Etudes IPECODE, Paris
Monsieur André Signora, Président de l'AFEDE, Paris
Monsieur Henri Sterdyniak, Département d'Econométrie, OFCE, Paris
Monsieur Joachim Volz, Deutsches Institut für Wirtshaftsforschung, Berlin

Pascal Mazodier: Après avoir enseigné l'économétrie (ENSAE, Harvard, Université de Paris IX et Paris I) et dirigé l'Unité de Recherche de l'INSEE, il est actuellement Chef du Service de la Conjoncture de l'INSEE.

"LA PREVISION MACROECONOMIQUE A COURT TERME EN PRATIQUE"

Cette table ronde doit permettre de faire se rencontrer d'une part des conjoncturistes français et étrangers qui sont eux-mêmes des "producteurs primaires" de prévisions macroéconomiques à court terme, d'autre part des utilisateurs directs de ces prévisions.

L'objet du débat est d'examiner quelles sont les méthodes et représentations qu'utilisent actuellement les prévisionnistes, et dans quelle mesure les besoins des utilisateurs pourraient conduire à modifier cette pratique en faisant appel à des techniques nouvelles.

Dr. Robert Fildes, Professor
Manchester Business School
Booth Street West
Manchester M15 6PB
England

Dr. Robert Fildes received his first degree in Mathematics from the University of Oxford in 1966, and his Ph.D. in Statistics from the University of California, Davis, in 1971. Since then he has taught statistics, operations research and forecasting at the University of Manchester Business School. He has published four books in forecasting and planning, most recently, **The Forecasting Accuracy of Major Time Series Methods** and **A Bibliography of Business and Economic Forecasting**. He was co-founder in 1981 of the **Journal of Forecasting**, and in 1985 of the **International Journal of Forecasting**. He has published numerous articles in academic journals, including **Economica**, **Management Science** and the **Journal of the Operational Research Society**. He has been a visiting professor at the University of British Columbia and Berkeley. In 1985 he was a Research Fellow at Bell Communications.

"GAINS IN SELECTING A UNIVARIATE FORECASTING MODEL"

Much recent research has concentrated on evaluating various methods of univariate forecasting, in particular the Makridakis competition. However, the major use of such models lies in inventory and production control applications. The conventional wisdom in this context is that there is not much to be gained by using the (slightly) more accurate forecasting procedures which have 'won' such competitions. This presentation will discuss what gains, if any, can be made from model selection procedures when used for inventory control. In passing, an evaluation will be made of research in time series forecasting which analyses a single series in depth.

Chair Estela Bee Dagum, Statistics Canada, Ottawa K1A 0T6, Canada

Président: **Bernard Cazes**, Commissariat General du Plan
18, rue de Martignac
Paris

Participants: **Jean Leca**, Institut d'Etudes Politiques, 27 rue St Guillaume, 75007 Paris
Martin Landau, Professor, Dept. of Political Science, University of California, 210 Barrows, Berkeley California 97720, USA
François Dupuy, C.S.O., 19 rue Amélie, Paris
François Bourricaud, Maison des Sciences de l'Homme, Boulevard Raspail, 75006 Paris

Bernard Cazes est Chef de la division des études à long terme du Commissariat Général du Plan, Paris. Ancien élève de l'ENA. Responsable des "Annales de la SEDEIS". Auteur de **Histoire des Futurs**, Seghers, Paris, 1986.

"L'AVENIR DES SYSTEMES DE GOUVERNEMENT DANS LES SOCIETES POST-INDUSTRIELLE"

Les processus de régulation du tissu collectif sont-ils en voie de connaître des transformations profondes? Y-a-t-il au contraire une forte autonomie entre la sphère du politique, les situations sociales et le devenir économique? Assistons-nous a un retour des idéologies? Tous les observateurs s'accordent à souligner que la gestion du collectif est en train de traverser une phase décisive de mutation: moins d'Etat, la décentralisation l'internationalisation des espaces socio-économiques, etc. La table ronde aura pour objectif de faire le point sur les facteurs structurants qui conditionnent l'avenir des phénomènes de gouvernement, politiques, civiques, administratifs, dans les sociétés, ce à la lumière des acquis les plus valables des sciences sociales et politiques.

TABLE RONDE / PANEL

Dr. Arthur Schleifer, Jr., Professor of Business Administration
Graduate School of Business Admin.
Harvard University
Soldiers Field
Boston, Massachusetts 02163
USA

Professor Schleifer, a member of the Managerial Economics area at the Harvard Business School, currently teaches a second-year MBA course in Business Forecasting.

Professor Schleifer is coauthor of **Finite Mathematics with Business Applications, Tables for Normal Sampling with Unknown Variance, Introduction to Data Analysis** (in progress), and a text and casebook on business forecasting (in progress). He has consulted widely in a variety of areas, including forecasting.

He received his AB in physics and philosophy from Yale in 1952, his MBA and DBA from Harvard in 1954 and 1961 respectively.

"TEACHING FORECASTING BY THE CASE METHOD"

Courses in business forecasting often focus on the statistical methodology of time series analysis, econometrics, or both, to the exclusion of other relevant technical and administrative issues important to managers. A series of cases developed by the speaker constitutes the backbone of a course in business forecasting taught at Harvard Business School. This paper describes that course, concentrating on some non-traditional topics which arise from an analysis of business practice.

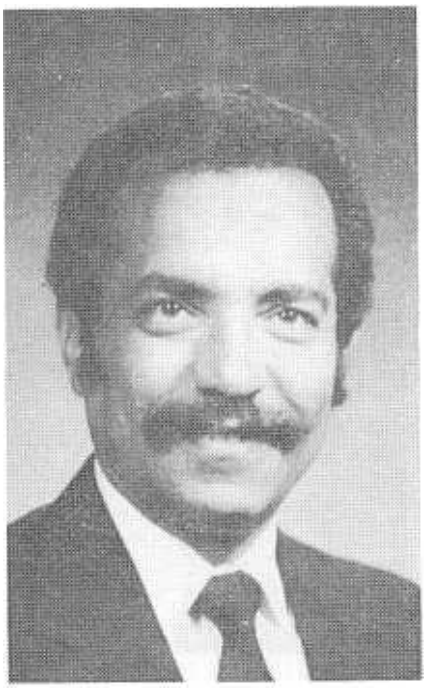
Chair: Muhittin Oral, Fac. des Sciences de l'Admin., Univ. Laval, Québec, Canada.

Chairperson : **Dr. Essam Mahmoud**, Associate Professor,
School of Management
Managment Science and Systems
University of Michigan-Flint
Michigan, 48503
USA

Participants: **Tim Davidson**, Temple Barker & Sloane Inc., 33 Hayden Avenue, Lexington, MASS 02173, USA.
Robert Goodrich, Forecast Master
Hans Levenbach, President, Core Analytic Inc., P.O. Box 742, Route 202, Far Hills, New Jersey 07931, USA
David Wright, University of Ottawa, Ottawa, Canada

Essam Mahmoud is currently Associate Professor of Management Science and Systems at the School of Management, University of Michigan-Flint. He obtained his Ph.D from the State University of New York at Buffalo. His interests are forecasting applications; the accuracy of forecasting methods; forecasting and decision support systems; the evaluation and selection of software, in particular for forecasting applications; and databases for business. He has published in the **Journal of Forecasting, Technological Forecasting and Change, The American Statistician** and **Computational Statistics and Data Analysis.** He serves as the Vice-President for Publications for the International Business School Computer Users Group.

"THE STATE OF THE ART IN FORECASTING AND SOFTWARE DEVELOPMENT"



The past three decades have seen a great deal of development in forecasting methods and systems. These advantages in both theory and practice have been largely in response to requirements placed on individual firms by the increasing complexity and competitiveness of the business environment. Companies of all sizes find it increasingly essential to make forecasts for a number of uncertain quantities which may affect decision-making and performance. As a result of the widespread use of computer technology, software developers are attempting to meet the needs of forecasters in both the business and academic environments. There are many forecasting software packages currently available. Some of these are technique-specific such as software for smoothing, adaptive, or Box-Jenkins techniques. Other software provides the user with comprehensive or integrated forecasting systems.

Forecasting theory has developed faster than the development of software. Therefore, it is useful to assess the state of the art in software for forecasting, to review what is available, what the needs are and what are the priorities for future developments.

TABLE RONDE / PANEL

Estela Bee Dagum, Director
Seasonal Adjustment
Statistics Canada
13-K, R.H. Coats Building
Ottawa, Ontario K1A 0T6
Canada

Estela Bee Dagum is Director of the Time Series Research and Analysis Division of Statistics Canada and Adjunct Professor of the Department of Statistics and Actuarial Sciences of Western Ontario University. She is a member of the Board of Directors of the International Institute of Forecasters, Fellow of the American Statistical Association, Elected Member of the International Statistical Institute and the First Recipient of the Julius Shiskin Award of American Statistical Association.

Dr. Dagum is the author of the X-11-ARIMA seasonal adjustment method officially adopted by the majority of the statistical agencies of the world. She has written and co-authored several books and published more than sixty papers in scientific journals in the fields of time series, seasonal adjustment, forecasting and econometrics. Dr. Dagum has been a Senior Consultant to the U.S. Presidential Commission on Employment and Unemployment Statistics, the U.S. Bureau of the Census, the U.S. Bureau of Labor Statistics, the Australian Bureau of Statistics and other international organizations. She is one of the Editors of the **International Journal of Forecasting**, Associate Editor of the **Journal of the Business and Economic Statistics of the American Statistical Association**, Associate Editor of the **Canadian Journal of Statistics**, and Associate Editor of the **Survey Methodology Journal**.

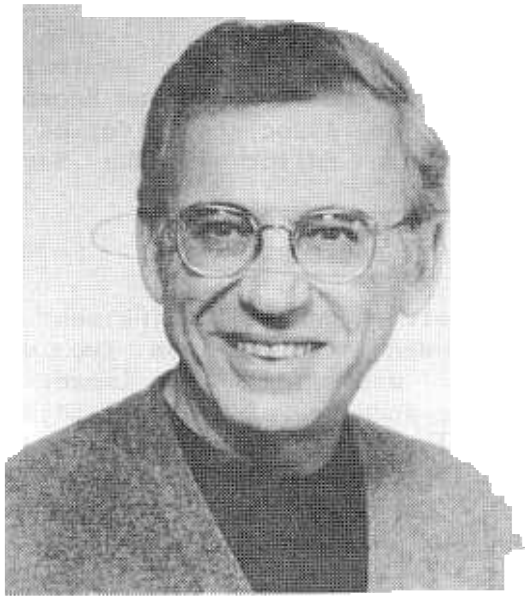
"SEASONAL ADJUSTMENTS FOR FORECASTING"

The relationship between seasonal adjustment and forecasting has been studied from two main viewpoints: one, assessing the impact of forecasting on the accuracy of seasonal adjustment, and two, evaluating the impact of seasonal adjustment on the accuracy of forecasts.
Several studies (Dagum, 1975, 1982; Geweke, 1978; Kenny and Durbin, 1982, Pierce 1978) have shown that extending original series with forecasts improves significantly the accuracy of the seasonal adjustment.
On the other hand, based on an empirical study with 111 series, Makridakis and Hibon (1979) concluded that forward seasonal factors obtained by X-11 or a simple ratio to moving average do not influence significantly the accuracy of the forecasts of the original series using the decomposition method.
The main purposes of this investigation are: (1) to evaluate the effect of three seasonal adjustment options from X-11-ARIMA, namely, (a) standard; (b) stable; and (c) fast moving, on the accuracy of forecasts obtained by the decomposition method, and (2) to compare the accuracy of forecasts obtained directly from seasonal ARIMA models with those from the decomposition method.

Chair: Maurice Deplas, Dep. Info., Univ. de Paris 2, 92 rue d'Assas 75006 Paris.

Martin Landau, Professor
Department of Political Science
University of California
210 Barrows
Berkeley, California 94720
USA

Martin Landau is a professor of political studies at the University of California at Berkeley. He has published extensively in the areas of his expertise.



"EPISTEMOLOGICAL GROUNDS OF FORECASTING"

The epistemological foundations of forecasting will be discussed and its relationship to scientific reasoning explored. The importance of understanding better the advantages/implications of future predictions and uncertainty will be explored.

Chair: Jean-Claude Thoenig, INSEAD, Bld de Constance, 77305 Fontainebleau, France
et Centre national de la recherche scientifique, Paris.

Dr. Renate Mayntz, Director
Max-Planck-Institut für
Gesellschaftsforschung
Lothringer Str. 78
5000 Köln 1
West Germany

Dr. Renate Mayntz, B.A. from Wellesley College, doctorate in sociology at the Free University of Berlin, honorary doctorates from the universities of Uppsala and Paris. Before going to the University of Cologne, she has held chairs at the Free University in Berlin and the Hochschule für Verwaltungswissenschaften in Speyer. She has taught at Columbia University and the New School for Social Research in New York; at the University of Edinburgh, at the FLASCO (Facultad Latino-Americana de Ciencas Sociales), Santiago de Chile and Stanford University. She has been Director of the Max-Planck-Institut für Gesellschaftsforschung in Cologne since 1985.

"LA PREVISION DANS LES SYSTEMES A DYNAMIQUE AUTOREGULEE"

The plausibility of post hoc explanations of societal developments and social events suggests that correct forecasting would have been possible if only the available theoretical and situational knowledge had been sufficient. This assumption neglects the constraints to forecasting inherent in the nature of the object. It will be argued that the dynamic properties of modern societies pose special barriers to forecasting and that a new type of theory is needed to understand the basic logic of the resulting discontinuous processes. Recent contributions to social theory will be discussed which provide some insight into the nature and structural determinants of different forms of an autonomous social dynamic, such as self-stimulating cycles, threshold phenomena, paradox effects, and the special power of remote causes.

Chair: Robert Doktor, University of Hawaii at Manoa, 2402 Maile Way, Honolulu 96822 Hawaii.

Planning résumé des sessions parallèles
Summary schedule of parallel session

Lundi 8h45 à 10h15 MONDAY 8:45 to 10:15 am

SALLE	SESSION	PRESIDENT	
Montparnasse A	Prévision et marketing I Forecasting and marketing I	R. Lewandowski	52-53
Montparnasse B	Sales forecasting systems Systèmes de prévision de ventes	T. Davidson	54-55
Montparnasse C	Telecommunications forecasting Prévision en matière de télécommunication	J. Wojnar	56-57
Gaité A	Exchange rate forecasting Prévision du taux de change	D. Alexander L. R. Thomas	
Gaité B	Forecasting for competitive strategy	M. Oral	60-61
Gaité C	Multivariate models for forecasting	J. Kling	62-63
Utrillo 1	Prévision socio-économique I	R. Courbis	64-66
Utrillo 2	Prévision en matière de transports Transportation forecasting	E. Quinet	67-68
Utrillo 3	Le capital risque	A. Chevalier	69-70
Utrillo 4	Rational expectations in forecasting	K. Wallis	71
Utrillo 5	Incertitude et investissements en électricité	P. Penz	72-73
Modigliani	Recent developments in multivariate time series	G. Mélard	74

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Planning résumé des sessions parallèles
Summary schedule of parallel sessions

LUNDI 10h45 à 12h15 / MONDAY 10:45 to 12:15 am

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Montparnasse C	Telecommunications forecasting Prévisions en matière de télécommunications	M. Jambu	78-79
Gaite A	Disequilibrium models Modèles de déséquilibre	P. Artus	80-81
Gaite B	Evaluation du risque politique I	S. de Klebnikoff	82
Gaite C	Economic forecast and models	D. Smyth	83-84
Utrillo 1	Prévision socio-économique II	E. Fontela	85-87
Utrillo 2	Forecasting financial variables	R. D Nair	88-89
Utrillo 3	Evaluation des taux d'intérêt et des obligations	C. Bito	90-91
Utrillo 4	OPEC and energy demand	C. Matutes	92-93
Utrillo 5	Forecasting for marketing	J. M. Choffray G. Lilien	94-95
Modigliani	Forecasting for business strategy	P. Fitzgerald	96-97
Gromaire	Societal forecasting I	P. Atteslander	98-99

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Summary schedule of parallel sessions

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Montparnasse B	Combining forecasts Combinaisons de prévisions	R. Williams	101-102
Montparnasse C	Telecommunications forecasting La prévision en matière de télécommunications	A. de Fontenay	103-104
Gaite A	Forecasting and productivity Prévision en matière de productivité	V. Selman	105-106
Gaite B	Evaluation du risque politique II	S. de Klebnikoff	
Gaite C	Forecasting inflation and recession	G. Moore	108-109
Utrillo 1	Prévision et évaluation technologique I	R. Barré	110-113
Utrillo 2	Statistical model building and prediction	F. Droesbeke	
Utrillo 3	Rentabilité et risque sur le marché immobilier	M. Albouy	
Utrillo 4	Anticipations rationnelles	G. Gourieroux	116-117
Utrillo 5	State and local government forecasting	S. Bretschneider W. Gorr	118-119
Modigliani	Forecasting and electricity supply	B. Lescoeur	120-121
Gromaire	Societal forecasting II	P. Atteslander	

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Planning résumé des sessions parallèles
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Montparnasse B	Evaluation of economic forecasts and models Evaluation des modèles et prévisions économique	K. Holden	125
Montparnasse C	Telecommunications forecasting Prévision en matière de télécommunications	M. Volle	126-127
Gaite A	Telecommunications forecasting Prévision en matière de télécommunications	J. Harvey	128-129
Gaite B	Econometric methodology and forecasting	C. Dagum	130-131
Gaite C	International macroeconomic forecasting I	J. Llewellyn	132
Utrillo 1	Prévision et évaluation technologique II	P. de la Saussay	133-135
Utrillo 2	Seasonality and seasonal adjustments	A. Maravall	136-137
Utrillo 3	Prévision de la demande d'électricité	M. Bénard	138
Utrillo 4	Modèles dynamiques microéconomiques	A. Trognon	139-140
Utrillo 5	Social and medical forecasting	M. Daub	141-142
Modigliani	Conflicts internationaux/ Forecasting international conflicts	A. Donneur	143

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Montparnasse C	Telecommunications forecasting Prévision en matière de télécommunications	P. Falchi	147-148
Gaite A	Expert-systems in forecasting Systèmes experts en prévision	S. Pinson R. Weitz	
Gaite B	Multicriteria decision models for forecasting	N. Bahmani	150-151
Gaite C	International macroeconomic forecasting II	J. Llewellyn	
Utrillo 1	Analyse des stratégies d'acteurs	K. Valaskakis	153-155
Utrillo 2	Financial forecasting	P. McMahon	
Utrillo 3	La volatilité du prix des actifs	D. Marteau	
Utrillo 4	The role of scenarios in forecasting	C. Vlek	
Utrillo 5	Prévisions de trésorerie dans l'entreprise	A. Chevalier	
Modigliani	Mathematical model building	J. de Gooijer	160-161

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Montparnasse B	Forecasting and decision making Prévision dans la prise de décision	A. Eerola	164-165
Montparnasse C	Telecommunication forecasting La prévision en matière de télécommunications	C. Buxton	166-167
Gaité A	Teaching in forecasting Enseignement de la prévision	A. Schleifer	168
Gaité B	Forecasting in Europe	S. Biffignandi	169-170
Gaité C	Forecasting in finance	J. Fisher	171-172
Utrillo 1	Analyse des stratégies d'acteurs	T. Durand	173-175
Utrillo 2	Modèles de prévision pour l'industrie du pétrole	D. Babusiaux	176
Utrillo 3	Economic forecasting	J. P. Marciano	177-178
Utrillo 4	Le risque-pays: risque financier	R. Pinçon	179
Utrillo 5	Prévision des comportements électoraux	A. Donneur	180
Modigliani	Planification financière et stratégique	G. Hirsch C. Hubeaux	181
Gromaire	Macroeconomic forecasting	M. Develle	181

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Montparnasse B	Forecasting and planning Prévisions et planifications	J. P. Netter	
Montparnasse C	Telecommunications forecasting Prévisions en matière de télécommunications	D. L. Fane	185-186
Gaité A	DSS and forecasting	E. Mahmoud	187
Gaité B	Time series forecasting	E. Lusk	
Gaité C	Prévision macroéconomique I	D. Perreau	
Utrillo 1	Comparaisons prévisions-réalisations	A. Babeau	
Utrillo 2	Governmental macroeconomic forecasting	H. Evans	
Utrillo 3	Taux d'intérêt et instruments financiers	F. Aftalion	
Utrillo 4	Economic and econometric Forecasting	A. Aykac	193-194
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Modigliani	Political risk forecasting	A. Khoshkish	

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Montparnasse B	La prévision du risque de change Forecasting exchange risk	A. Chevalier	199
Montparnasse C	Telecommunications forecasting Prévision en matière de télécommunications	M. Gensollen	200-202
Gaité A	Topics in forecasting	M. Hibon	203-204
Gaité B	D.S.S. and Forecasting	E. Mahmoud	205
Gaité C	Prévision macroéconomique II	P. Perreau	206
Utrillo 1	Le marché immobilier demain	B. Thion	207
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PREVISION ET MARKETING I

Chair: Rudolph Lewandowski, Marketing Systems, Germany.

"COLGATE PALMOLIVE"
M. Quinchon, France and M. Chipos, France

La societe COLGATE PALMOLIVE France utilise un logiciel previsionnel sur ordinateur central depuis 1977. La decision d'etablir des previsions par produit fut prise par la Direction generale, avec le support du service d'organisation et management. Depuis lors, la prevision des ventes est effectuee mensuellement en y integrant l'ensemble des activites de promotion et de marketing. La volonte de la Direction generale et du marketing d'asseoir des estimations previsionnelles sur une base systematique a permis d'ameliorer fortement la qualite des previsions.

La quantification de la reaction des marches aux differentes actions promotionnelles ont permis par ailleurs d'ameliorer la qualite du "systeme d'informations" de la Direction des produits.

Compte tenu de l'amelioration substantielle atteinte, la plupart des societes internationales du groupe COLGATE PALMOLIVE ont decide d'utiliser la meme methodologie : depuis la Canada, les USA et Mexico jusqu'a l'Europe (l'Allemagne, la Belgique, l'Espagne utilisent FORSYS de facon operationnelle).

Une organisation a ete mise en place pour assister les utilisateurs de langues differentes (francais, allemand, espagnol, anglais). Des "antennes" ont ete mises en place aux Etats Unis et en Europe pour assister directement les utilisateurs.

"UNION DE BRASSERIES (FRANCE)"
M. Cogne, Directeur informatique et M. Foucaud, Directeur logistique, France.

Compte tenu des problemes particuliers rencontres par la brasserie francaise, il fut decide des 1984 de mettre en place un systeme de prevision integre permettant d'analyser les differents produits au sein de l'UNION DE BRASSERIES et dans les societes du groupe, en particulier PELFORTH. Vu les fortes differences enregistrees au niveau des ventes des produits suivant les regions, des effets des activites marketing et de la climatologie, une analyse efficiente des ventes a l'aide des methodes traditionnelles s'averait tres difficile.

Le systeme FORSYS a d'abord ete adapte aux specificites de la societe.

Le systeme devait servir, dans une deuxieme phase, d'input au systeme de logistique compte tenu des differentes unites de production reparties sur toute la France.

Une analyse detaillee au niveau du produit et de la region s'averait des lors necessaire. La methodologie du "transfert automatique des informations marketing" a permis de simplifier le probleme de l'alimentation en informations.

Les ameliorations de la prevision ont ete d'environ 20%. Il faut insister, par ailleurs, sur la reduction sensible des sous ou surestimations systematiques des ventes pendant plusieurs mois.

Un interface avec un systeme de production et de logistique a ete mis en place. Actuellement, environ 2000 series sont analysees et estimees au niveau mensuel.

En outre, le systeme sert a la definition des objectifs des ventes, a la mensualisation des objectifs au niveau des produits et des regions ainsi qu'a la gestion par exception des realisations.

"VOLKSWAGEN R.F.A."
M. Salau, and M. Lewandowski Marketing Systems.

L'utilisation de systemes d'informations integres pour la prevision a court, moyen et long terme s'est surtout developpee en Europe au cours des dernieres annees.

Actuellement, un grand nombre de societes automobiles europeennes disposent d'un systeme previsionnel integre permettant d'analyser l'evolution mensuelle des ventes par pays et par modele. Par ailleurs, ces methodes previsionnelles evoluees, permettant d'analyser quantitativement l'evolution des marches, des segments, et les ventes des differents modeles, commencent a faire les preuves de leur efficacite.

L'experience acquise aupres des constructeurs automobiles europeens, en particulier FIAT, AFLA ROMEO, VW, BMW, DAIMLER BENZ permet de penser qu'une certaine avance dans l'analyse des marches a pu s'effectuer par rapport a d'autres branches industrielles.

Le cas particulier de la mise en place d'un systeme previsionnel comme outil d'analyse systematique est celui de VW. Il fait partie d'un systeme general de planification dont le module de prevision et d'analyse a ete acheve en 1984. Une utilisation operationnelle a debute en 1985.

L'exploitation de la banque de donnees des immatriculations des principales variables de l'environnement specifique a chaque marche s'effectue a l'aidè d'un conversationnel facile d'utilisation, alliant les technologies de pointe comme FORSYS et MARKET aux processus automatiques d'utilisation.

L'exploitation de ce systeme est faite non seulement par les differents services centraux a Wolfsburg (RFA) mais egalement par les differentes filiales en Allemagne et a l'etranger.

SALES FORECASTING SYSTEMS

Chair: Timothy Davidson, Principal, Temple, Barker and Sloane, Inc, 33 Hayden Ave, Lexington, Massachusetts 02173, USA

"MINING THE GOLD: SENSIBLE SALES FORECASTING SYSTEMS FOR BUSINESS"
Timothy Davidson, Principal, Temple, Barker and Sloane, Inc., 33 Hayden Ave., Lexington Massachusetts 02173, USA

Few organizations are happy with the forecasts that drive their long and short term planning. Just-in-time manufacturing practice depends in large part on accurate forecasts of sales demand at disaggregated levels of detail. The economic benefits derived from an in-house forecasting function suggest that there is an undiscovered goldmine in most manufacturing firms. But what kind of forecasts are needed? To what extent are judgmental estimates better than forecasts produced by quantitative models?

Mr. Davidson will outline the steps involved in improving routine sales forecasting from the initial forecasting audit, to the implementation and operation of computer-based decision support systems that take the "dog work" out of administering an on-going forecasting function. He will identify the role that the marketing plan plays in the short-term sales forecast and the importance of judgmental review and overrides.

He will reveal the results of a survey of sales forecasting administrators of major consumer goods manufacturers in North America. Prior job experience, educational background, duties, personal characteristics, and salary ranges of the respondants will be discussed. Organizational structures and managerial behavior which impede the benefits of in-house forecasting departments will be identified.

Mr. Davidson's presentation will be based on twenty years of experience in the development of sensible forecasting systems and procedures that put the manager in control without him or her having to be expert in the mathematical/statistical underpinnings of forecasting methods.

"FORECASTING SYSTEMS"
Dr. Robert Fildes, Manchester Business School, Booth St. West, Manchester M15 6PB

Many companies in their forecasting for production and inventory control have to resolve the problem of forecasting hundreds or even thousands of products, perhaps as frequently as monthly. Devising systems for evaluating the effectiveness of a system in place, and designing an improved system cannot be carried out by standard statistical approaches which are based on the careful analysis of one or two series. Very little research has been carried out on analyzing large forecasting systems, despite the prevalence of the problem. This session will present an overview of issues in system design including segmentating the series into homogeneous sub-groups, selecting an appropriate forecasting method, and the use of monitoring schemes to ensure the system is 'under control'.

The session will start with a survey of current problems by the chairman, followed by brief presentations by people working on these issues. The session will end with comments and discussion from the floor.

"CONFIDENCE INTERVALS IN FORECASTING"

Spyros Makridakis, Research Professor and Michele Hibon, Research Fellow, INSEAD, Bld. de Constance, Fontainebleau, France

The purpose of this talk is to measure empirically the percentage of actual values that fall outside the forecasted confidence intervals. This is done for all methods except that of Box-Jenkins (see Lusk and Belhadjali, 1987). All 1001 time series of the M-competition are used, except for the methods that were only used on the subsample of 111 series. Firstly, we will briefly discuss the concept of confidence intervals. Secondly we will present the empirical results for each method in the M-Competition. In addition, in order to facilitate comparisons, we will list the percentage of forecasts outside the confidence intervals using the standard deviation of Naive 2 method to construct these intervals. Thirdly we will discuss the results and their implications for the theory and practice of forecasting. Finally we will suggest some future work that might help improve the theory and practice of forecasting confidence intervals and briefly outline the assumptions required to construct confidence intervals and their statistical implications.

TELECOMMUNICATIONS FORECASTING : APPLICATIONS AND EMPIRICAL ANALYSIS

Chair: J. Wojnar, Bellcore, USA.

"FORECASTING TOTAL INTERSTATE MINUTES OF USE"
William Taylor and Victor Glass

The purpose of this paper is to propose a methodology to accurately forecast total interstate minutes of use. Since the breakup of the Bell system, all interexchange carriers are charged access rates for using the local telephone network. These access rates are based, in part, on a forecast of total minutes of use flowing through the local network. In particular, the carrier common line rate is set on a nation-wide basis. An accurate forecast of minutes used to calculate the common line rate is imperative because unexpectedly high or low revenues generated by the common line rate could lead to a costly refiling. One of the prerequisites for an accurate forecast of total interstate minutes is an accurate total minutes historical series. Unfortunately, there is not one total minutes series that is accurate. Instead, there are several, each one inadequate by itself but when combined improve forecast accuracy. With this in mind, the objective of this paper is to optimally combine the forecasts generated by these series.

"DATA DEVELOPMENT FOR ANALYSING THE BENEFITS OF TELECOMMUNICATIONS FOR SOCIO-ECONOMIC DEVELOPMENT"
J. Alleman, UIT, Geneva, Switzerland.

This paper will indicate how to collect the data necessary for assessing the benefits of telecommunications for socio-economic development. It will indicate possible sources of data, or indicate how surveys can be undertaken to collect the data. It will set up the "recipes" - the methodology to do one's own data collection and surveys needed to calculate and accord the right priorities to telecommunications investments and their expected benefits.

"UTILIZING AUTOREGRESSIVE MOVING AVERAGE MODEL IN CONJUNCTION WITH LEAST SQUARE REGRESSION TECHNIQUES"
Dan Springer, Pacific Telephone, Room 1040, 120 Montgomery St., San Francisco, CA 94104, USA.

The purpose of this paper is to propose the combined use of ordinary least squares linear regression and ARIMA time series for forecasting purposes. The idea is to create a theoretical model encompassing all of our explanatory powers for a series, and then to use ARIMA on that series' residuals to improve the forecast capabilities of our model. In some cases it is impossible to combine techniques and still preserve independence, but not here. The residuals from our linear model represent the unexplained portion of the series, thus, we can perform statistical machinations on them independent from the original model as long as we do not use any variables which are colinear to variables in the original model. Since our ARIMA model will only use past and present values of the residuals, it is

definitionally independent from the original series and model. Therefore, we can reasonably expect the benefits from the two individual techniques to be additive in the creation of this new method. This makes a great deal of sense when we consider the underpinnings of the separate forecasting techniques. We use linear regression to take advantage of the knowledge we have about variables which are highly correlated to the series for which we are trying to forecast. With the exception of equations using lagged dependent variables, the linear regression models do not look to past values of the forecasted series. Whereas, with the ARIMA model we rely solely on the past values of the forecasted series.

The true merit of this methodology rests not with the technique but rather with its results. We have a situation where the ends justify the means (although the means really don't need any further justification). I have experimented with this idea on a variety of different series and have experienced exceptional reduction of forecast error by implementing the ARIMA technique on my residuals. I will try to give a flavor for the flexibility of the method by detailing two similar yet different approaches for utilizing the combined forecasting system.

"BELL OF PENNSYLVANIA SWITCHED ACCESS AND TOLL USAGE INTEGRATED CONTRIBUTED ANALYSIS MODEL"

Joseph Sorresso, Bell of Pennsylvania, USA.

No abstract.

"TELECOMMUNICATIONS FORECASTING IN CANADA : FACT OR FOLLY"

T. McPhail, Director and Professor, Communications Studies Programme, The University of Calgary, Calgary, Alberta, T2N 1N4, Canada.

This paper will address the issues of the Canadian telecommunications environment to the year 2000. In particular, observations will be made and data will be reported concerning the evolving telecommunication technologies, market structures, and regulatory framework along with further comments concerning their impact on each other. Three major types of sources will be utilized. First, an extensive computer-based literature search and review; second, interviews with senior telecommunication decision makers from all sectors, including public and private enterprises in Canada; and, third, recent public policy statements made by provincial and federal regulators and government officials will be detailed.

The paper will conclude with a discussion of the application of forecasting to the telecommunications sector including a discussion of technological determinism in the sector, international forces or influences, e.g. deregulation affecting regulatory environment, and finally, the international, e.g. transborder data flow (TBF) trends which are blurring the distinction between national and international telecommunication systems and services.

EXCHANGE RATE FORECASTING

Chair: Don Alexander, Citicorp Investment Bank and Lee R. Thomas 111, J. Arons Division, Goldman, Sachs & Co., USA.

"A REEXAMINATION OF THE PERFORMANCE OF STRUCTURAL EXCHANGE RATE MODELS IN THE 1980'S"

Don Alexander, Citicorp Investment Bank and Lee R. Thomas 111, J. Arons Division, Goldman, Sachs & Co., USA.

This study updates the performance of various structural exchange rate models based on methodology developed by Meese and Rogoff (1983). The first part of the study updates various forms of the monetary/asset exchange rate model through 1985. The models use realized values of future explanatory variables to produce their point forecasts over different time horizons. A second part of the study will compare the use of time varying parameters based on a Kalman Filter methodology as a means to improve forecast performance. A third part of the study will compare the results of these models with various random walk models and reformulations of the monetary/asset exchange rate models.

"HAVE THE STOCHASTIC PROPERTIES OF THE MAJOR DAILY EXCHANGE RATES CHANGED SINCE THE G-5 SUMMIT?"

Niso Abuaf, Chase Manhattan Bank, USA.

This paper analyzes the stochastic properties of daily movements in the major exchange rates before and after the September 1985 G-5 summit. The preliminary findings of the paper are listed below.

1. With the exception of the British pound, computed daily volatilities have declined after the September summit -- as expected. This is also revealed by the implied volatilities, and for all the currencies of our sample. Hence, the computed volatility of the British pound may be an aberration. In fact, it is probably due to the recent increase in oil price uncertainty.
2. Since the G-5 summit, there seems to be a downward move, with the exception of Japan, in the first order autoregressive coefficients. This implies that exchange rate changes may be more predictable now than before the summit. This indicates that a stategy of betting against central banks might prove profitable.

"THE EFFECTS OF PROLONGED EXCHANGE RATE REGIMES ON TRADE EQUATION PARAMETERS"

Stephan Thurman and Lucia Foster, Fiscal Analysis Division, Congressional Budget Office, Washington, D.C. 20515, USA

Inspection of basic merchandise trade equations estimated over different sample periods during the unprecedented exchange rate environment of the last five years suggests empirical evidence for plausible shifts in macroeconomic responses to exchange rate changes. Trade balances in both real and nominal terms have not responded with as much vigor to changes in relative exchange rate adjusted prices as before. The J-Curve has disappeared. International inflation transmission linkages seem to have weakened temporarily. A possible explanation for these response shifts is that economic agents respond differently to prolonged periods of currency appreciation than to sustained periods of depreciation.

"FORECASTING FOREIGN EXCHANGE RATE CHANGES FOR THE CONVERTIBLE YUAN OF THE PEOPLE'S REPUBLIC OF CHINA"

Professor Ronald E. Hoyt, China Program Coordinator, Faculty of Administration, University of Ottawa, Canada

This paper analyzes changes in the rate of exchange for the convertible Yuan relative to the currencies of China's major trading partners. China's exchange rate changes (for the convertible Yuan) are the responsibility of the People's Bank of China and are set by the State General Administration of Exchange Control, who also advise on exchange control policy.

For the period evaluated (1980-1985) a discriminant model is employed to determine the relative importance of changes in rates of exchange of major international currencies for setting the value of the Yuan. The results are then compared with the theoretical rates obtained from the changes in relative price levels of major trading partners. Implications are drawn for China's current trade and investment policies.

"FORECASTING THE VOLATILITY OF CURRENCY EXCHANGE RATES"

Dr. S. J. Taylor, University of Lancaster, Gillow House, LA1 4YX, UK

The volatility of financial prices changes frequently. Volatility is defined to be the standard deviation of (log) price changes. Volatility forecasts are compared for DM/$ futures traded at the IMM in Chicago by using daily prices (open, high, low and close) from 1977 to 1983. The best forecasts are useful for pricing currency options.

FORECASTING FOR COMPETITIVE STRATEGY FORMULATION

Chair: Muhittin Oral, International Institute of Forecasters, Faculté des Sciences de l'Administration, Université Laval, Québec, G1K 7P4, Canada.

"STRATEGIC PLANNING FOR COMPETITIVE ADVANTAGE"

Muhittin Oral, Industrial Competitiveness Research Unit, Faculté des Sciences de l'Administration Université Laval, Ste-Foy, Québec, P.Q. G1K 7P4, Canada

The increasingly important role of competition in shaping long-term strategies of industrial firms has been more and more recognized by managers and academicians alike. This has prompted an immediate increase in the number of studies that explicitly link strategy and competition. Most of the studies done in this connection however are either too descriptive or firm-specific, and therefore difficult to make operational in other settings. The present paper discusses the use of an industrial competitiveness model, a model which has already been employed in practice at micro and macro levels, for the purpose of strategic planning. Such a model-based approach is essential if one is interested in (i) measuring the competitiveness level of a given industrial firm, (ii) identifying the strengths and weaknesses of the firm, and (iii) formulating strategies to improve and sustain the competitive position of the firm.

"FORECASTING COMPETITORS' ACTIONS: AN ASSESSMENT OF TECHNIQUES AND RECOMMENDATIONS FOR RESEARCH"

Alan E. Singer and Roderick J. Brodie, Department of Business Administration, University of Canterbury, Christchurch, New Zealand.

The task of forecasting competitors' actions is often an important part of the development of marketing strategies. Despite the importance of this task, Armstrong (1985) has concluded that little is known about which, if any, of the available forecasting techniques are useful for this purpose.

This paper contains a brief review of the relevant marketing, economics, business policy and psychology literatures concerning competitive processes and discusses implications for forecasting competitors' actions. It identifies the different circumstances where these forecasts are needed and the suitability of various techniques. Finally, recommendations are made about the research required to develop clearer guidelines for forecasting competitors' actions.

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"INDUSTRIAL COMPETITION AMONG THE FEW: THE MAKING OF A DISAGGREGATED INDEX TO ESTIMATE STRUCTURAL COMPETITIVE STRENGTH"

C.-René Dominique, Faculté des Sciences de l'Administration, Université Laval, Ste-Foy, Québec, PQ G1K 7P4, Canada

Competition among the few is a dominant market regime and yet its theories are perhaps the most unsatisfactory among the various theories of the firm. As an attempt to reduce this lacuna, a simple scheme which uses the concepts of physical system efficiency, cost effectiveness and marketing competence is proposed to assess the competitive strengths of manufacturing firms. The dynamic properties of this scheme are also discussed within the context of the theory of the firm.

"THE Q RATIO AS A PROFITABILITY FORECAST FOR CORPORATE STRATEGY FORMULATION"

Gilles Bernier, Faculté des Sciences de l'Administration, Université Laval, Québec, Canada.

The modern theory of asset valuation and capital markets stipulates that the ratio of the change in market value to the cost of the incremental capital, or marginal q ratio, is an indicator of the relative potential profitability of investment. Employing q as a profitability forecast indicates that the higher the q the more desirable is the investment project.

This q ratio concept is also employed by major consulting firms in the area of strategic management to the problem of assessing the value-creation potential of individual business decisions. This paper investigates the theoretical determinants of q in order to help managers in identifying future profit prospects that determine the true economic value of the business strategy.

MULTIVARIATE MODELS FOR FORECASTING

Chair Professor John L. Kling, McIntire School of Commerce, University of Virginia, Monroe Hall, Charlottesville, Virginia 22903, USA

"PREDICTING THE TURNING POINTS OF BUSINESS AND ECONOMIC TIME SERIES WITH BAYESIAN VAR MODELS"

Professor John L. Kling, McIntire School of Commerce, University of Virginia, Monroe Hall, Charlottesville, Virginia 22903, USA

Standard linear least-squares prediction methods are not directly applicable to making probability statements about time-series turning points. Wecker suggested a method for extending the least-squares technique to allow computation of the probability distribution of the turning points of a time series. Wecker's analysis was univariate and did not consider all sources of uncertainty (i.e., estimates of coefficients). The primary purpose of my paper is fourfold: (1) to extend Wecker's analysis to the case of the multiple time series model; (2) to consider all sources of model uncertainty; (3) to test the procedure for reliability (method of calibrations); and (4) to demonstrate some interesting applications.

"NOTRE EXPERIENCE DE L'UTILISATION DES MODELES ARIMA A FONCTION DE TRANSFERT"

M. Borgard et son équipe, Gaz de France, Paris, France

On a expliqué l'influence de différents paramètres climatiques sur les ventes de gaz par des modèles ARIMA à fonction de transfert.

1) Une application a été mise en place a la fin 1981. Elle porte sur une centaine de series mises à jour chaque mois. Les modèles sont périodiquement réactualisés et servent a calculer des parametres descriptifs et des previsions. On tire les enseignements de cette experience longue de pres de 5 annees.

2) Une application portant sur les données journalières est en cours d'élaboration. Elle étudie la combinaison des influences climatiques diverses (6 paramètres climatiques sont éxaminés) et de la saisonnalité. Elle est destinee à l'élaboration des prévisions a très court terme.

*"THE EFFECT OF MISSPECIFICATION ON ESTIMATION FOR VECTOR ARMA MODELS"

Ken Hung and Frank B. Alt, College of Business and Management University of Maryland, College Park, Maryland 20742, USA

This study investigates the effects of model misspecification on parameter estimation and forecasting for bivariate ARMA (1,1) models. Simulation is used to generate 500 hundred replications from such a process. T = 50, 75, 100, 200 observations are used for parameter estimation, and the remaining observations yield h-step ahead forecasts, h = 1,2,3,4. These forecasts are compared with their actual values. The prediction mean-square errors, the sample covariance matrices of the forecast errors and the bias of the estimated coefficients are computed. This is accomplished for different

sets of 0 and 0. Also, instead of fitting an ARMA (1,1) model, five intentionally misspecified models (p,q)=(2,1),(1,2),(1,0),(0,1) and (2,0), are fitted to the same observations.

"AUTOMATIC FORECASTING OF MULTIVARIATE TIME SERIES"

Pamela A. Texter and J. Keith Ord, 310 BAB, Management Science Department, The Pennsylvania State University, University Park, PA 16802, USA

This paper examines situations where automatic model selection techniques may facilitate the forecasting task. The major issue to be evaluated is whether automatic model selection methods generate forecasts which are as accurate as those produced by experts. Within this realm of automatic forecasting, the performances of multivariate and univariate techniques are assessed. The second issue of interest is the performance of leading indicators as input series for multivariate methods. Finally, the use of ex ante and ex post forecasts for the input series is compared. Selected indicator, industry and international macroeconomic series are used to evaluate forecasting performance.

NOUVELLES VOIES DE LA PREVISION SOCIO-ECONOMIQUE I

Chair: R. Courbis, Professeur, Universite de Paris X, 2 rue de Rouen, 92001, Nanterre, France.

"THE ACCURACY OF FRENCH OFFICIAL FORECASTS : AN APPRAISAL FOR 1960-1984"

R. Courbis, Professeur, Universite de Paris X, 2 rue de Rouen, 92001, Nanterre, France, and Tayo Dovoedo (GAMA, University of Paris Nanterre and CNRS).

The purpose of this paper is to evaluate the performancse of th forecasts for the current year and the next year that Government presents each year (in October) for the discuss by the Parliament of the "loi de finances" (Government Budget).

An analysis on 25 years is difficult : according to the changes in the national accounts (concepts and/or evaluation), definitive results are not always directly comparable to forecasts; the same figures are not always available.

For real GDP and its components, it appears that the official forecasts for next year are better proxy of effective fugures in the 1970's than in the 1960's, even if errors are more important (except for exports) for 1974-1980. Progress are made for the current year, except for business investment. On the contrary, forecasts for inflation are less satisfactory on the 1970's and 1980's than in the 1960's; they are also now quite more biased and underestimate almost always inflation.

"L'INFLUENCE DES FACTEURS SOCIO-CULTURELS SUR L'AVENIR DES ECONOMIES AVANCEES"

Hugues de Jouvenel, Association internationale futuribles, 55 rue de Varenne, 75007, Paris, France.

La prévison dans le domaine de l'économie, des sciences et des techniques s'est considérablement développée; elle est restée, dans le domaine social, très insuffisante faute de disposer d'outils bien adaptés pour saisir l'évolution de facteurs qualitatifs échappant aux instruments de mesure classique.

Pourtant, l'innovation technologique, la transformation et l'adaptation du système productif, la compétitivité de l'économie dépendent étroitement de la capacité et de la volonté de changement, d'adaptation, d'innovation des individus et des organisations. Il est donc essentiel d'essayer d'appréhender comment évolueront les aspirations, les attitudes, les comportements des individus et comment ces évolutions sociales affecteront la croissance économique et le progrès technologique.

Cet exposé rendra compte des enjeux sous-jacents au développement d'une telle prospective sociale et rendra compte des progrès réalisés quant aux méthodes d'analyse du changement social à moyen et long terme. Sera notamment exposé un système original d'étude mis au point au niveau de l'ensemble des pays de l'OCDE et présentées les conclusions principales de

cet exercice sur le changement socio-culturel aux Etats-Unis, au Japon et en Europe de l'Ouest à l'horizon de vingt ans.

"ANALYSE MULTICRITERE EN AVENIR INCERTAIN"

J. Fèvre, Aluminion Pechiney, 23 rue Balzac, Paris 75008, France.

L'internationalisation de l'offre, la faible croissance des demandes mondiales, les fluctuations des taux de change et des inflations, la forte accélération des mutations techniques ont intensifié la concurrence entre les entreprises. La compétitivité de ces dernières se caractérise avant tout par son instabilité. Désormais, l'analyse stratégique s'effectue en "avenir incertain".

Pour faire face à cette montée de l'incertitude dans un environnement de plus en plus complexe, il est nécessaire de positionner l'entreprise (ses clients, ses activités industrielles et commerciales, ses compétences technologiques ou marketing) en fonction de plusieurs logiques multicritères :

- logique clients (typologie, critères de l'acte d'achat),
- logique sociale (prise en compte des habitudes de consommation, modes, inerties...),
- logique industrielle (techniques de mise en oeuvre utilisées pour la fabrication des produits),
- logique économique et financière (contenu du prix de revient, coût d'un changement de technologie....).

La différenciation peut alors être planifiée et quantifiée :

1. innovation dans la segmentation des activités de l'entreprise,
2. mise en place de stratégie commerciale nouvelle,
3. adoption d'une organisation humaine, d'un cheminement industriel et technologique, d'une politique de communication (interne et externe) cohérents avec les stratégies commerciales retenues.

"FROM FORECASTING TO INTELLIGENCE"

Dan A. Seni, P. Eng., PhD.,Vice Président, GAMMA Institute, Montréal, CANADA.

Forecasts serve many different ends in decision making processes. These vary from simply providing information on the state of a system being monitored to the making of critical forecasts that give direction to a general policy or a broadly based plan.

The paper will deal with the use of forecasts in the context of a planning framework. Two central points will be developed. First, we will suggest a semantic analysis, based on semantic levels, of forecasts as data, forecasts as information and forecasts as intelligence. It is proposed that although all three enter into the planning process, the distinction is fundamental in as much as the last category must be present in plan formulation.

Second, we will dwell on the distinction between forecasts as information and forecasts as intelligence in the context of the theory of meaning, by analyzing some of the semantical characteristics of intelligence. Among others, it willbe suggested that forecasts are turned from data to intelligence by locating them within argumentative structures. In this way, forecasts are rendered context dependent and meet criteria or relevance.

"L'INTERNATIONALISATION ACCRUE DE L'ECONOMIE ET LA PROSPECTIVE AU NIVEAU D'UN SECTEUR INDUSTRIEL"

A. Signora, CCSF, 5 Bis rue de Madrid, 75379, Paris, France.

L'internationalisation, ne serait-ce que sous la forme d'une perméabilité accrue des frontières aux échanges de produits, est un facteur que la théorie économique intègre encore très mal. Au niveau d'un secteur, cette intégration est cependant indispensable. L'économiste est alors amené à construire des scénarios économiques mondiaux cohérents qui comportent des hypothèses sur des politiques économiques alternatives pour les grands pays et des contraintes qui ne sont pas du seul domaine de l'économie, mais aussi de la stratégie politque ou de la sociologie. Il doit ausi tenir compte de l'évolution possible, non seulement de la demande de ses produits, mais également de l'offre et des nouvelles stratégies ecommerciales que leur rapport implique. Enfin, il doit être très attentif à des innovations technologiques qui désormais s'étendent très rapidement au monde entier. Comme personne ne peut prétendre à un savoir universel, le dialogue avec d'autres disciplines apparaît indispensable.

TRANSPORTATION FORECASTING

Chair: Emile Quinet, Ecole Nationale des Ponts et Chaussées, Paris, France.

"Evolution des Modèles D'analyse et de Prévision à la RATP"
M. Rousseau, RATP, France.

Dans les annees 1970, la RATP, entrée dans une période d'intense développement de son réseau ferré, a construit une chaine de modèles de prévision de trafic, permettant d'améliorer la qualité des dossiers présentès à ses tutelles sur les projets d'extension.

Depuis 1980, afin d'évaluer et de comparer les conséquences de diverses politiques globales de transport, des modèles désagrégés ont été élaborés.

Les études actuellement entreprises consistent d'une part, à accroitre la productivité des modèles existants au niveau de la saisie et de la mise a jour des données démo-économiques, d'autre part, à étendre le domaine d'action de ces outils en prenant mieux en compte les aspects qualitatifs de l'offre.

"PROJECTIONS DE LA DEMANDE INTERREGIONALE EUROPEENNE EN TRANSPORT DE PERSONNES ET DEVELOPPEMENT D'UN RESEAU FERROVIAIRE A GRANDE VITESSE"
Roger Marche, INRETS, France.

A la demande de la Commission des Communautés Européennes, trois Instituts de recherche dans les transports (D.F.V.L.R. - I.R.T., maintenant INRETS - N.V.I.) ont réalisè conjointement, en 1984 et 1985, une étude prospective du dévéloppement d'un réseau ferroviaire à grande vitesse dans la Communaute euroéeenne, ayant pour but d'obtenir une premiere evaluation économique de diffèrents niveaux de developpement de ce réseau.

Les projections de la demande ont été effectuées pour l'horizon 2010, en utilisant largement le modelè de l'Action COST 33.

Les rèsultats obtenus montrent : d'une part, une rentabilité soci-économique satisfaisante et, d'autre part, un impact élévé sur la demande internationale, qui illustre l'intérêts communautaire du réseau.

"COMPUTER-BASED CREW SCHEDULING OF TRAIN AND ENGINE PERSONNEL"
Frank T. Anbari, Amtrak, Information Systems Department, 1617 John F. Kennedy Boulevard, Philadelphia, Pennsylvania 19103, USA.

Amtrak has developed and implemented a sophisticated computer-based system to support the management of train and engine crews for various crafts, work zones and crew bases, including the following functions: future position advertisements and awards, creation and filling of various vacancies, annulments and abolishments of positions, furloughs, recalls, displacements, reporting off duty, reporting back for duty, flowbacks, and vacations of employees. The system permits the maintenance of accurate position and employee records, predicts awards, furloughs, recalls, etc. for the following (14) days, responds to on-line inquiries for assignment, dispatch, and verification, and generates required operational and management reports.

"THE COHORT PROCESSING MODEL FOR LONG TERM FORECASTING OF CAR OWNERSHIP"

Van den Broecke, Social Research B.V., Van HIjenrodeweg 355, 1082 HO Amsterdam, Netherlands.

The COHORT PROCESSING MODEL for long term forecasting of car ownership is based on highly disaggregated population forecasts for the next 25 yers which are constructed from forecast data available from the Dutch Central Bureau of Statistics and the Dutch Central Planning Bureau. Instead of using a macro income distribution model, the average personal income is derived from available very detailed statistics.

By linking, for the priod 1980-1985, the income growth to the growth (positive or negative) of car ownership in subcohort (subgroups) cells, car ownership growth elasticity for income growth is calculated, using a mathematical model in which car ownership growth is dependent on income growth and saturation level. Saturation levels appear to be very different for the different subcohorts : the saturation levels for drivers license holding per subcohort are used and these are dependent on age, sex and educational level.

By analysing the empirically based developments within the matrix subcohort cells as to income and car ownership over the period 1980-1985 the parameters for the elasticity function are estimated.

The model is then validated by "predicting" car ownership in 1975 with these parameters from the matrix 1980 and comparing the results with observed car ownership in 1976. (As the statistics on car ownership in 1975 are less detailed than in 1980, it is not possible to attribute car ownership to each cell of the matrix 1976). Parameters are then re-estimated.

In the forecasting model not only these parameters appear but also supplemental growth factors to account for the start of car ownership with the young and the decline of car ownership with the aged.

LE CAPITAL RISQUE

Président : A. Chevalier, Professeur au Groupe de l'Ecole Supérieure de Commerce de Paris.

Cette session consacrée au Capital Risque et à son futur a pour objectif d'explorer successivement les règles du jeu dans lesquelles le Capital Risque doit s'inscrire, la prévision du besoin de financement des entreprises, un exemple de méthode de prospectives et d'évaluation développé dans une institution spécialisée, et enfin les prospectives du Capital Risque en France.

"LE CAPITAL RISQUE ET LES REGLES DU JEU"
Pierre Battini.

Les projets de développement d'entreprises financés par les fonds du Capital Risque doivent s'inscrire dans les schémas des institutions spécialisées et respecter leurs méthodes d'élaboration et d'analyse, et satisfaire à leurs critères. Pierre Battini propose une réflexion sur ces problèmes de prévision financière dont la qualité de la résolution induit pour une bonne part le résultat des négociations et du montage financier.

"LE CAPITAL RISQUE : LA PREVISION DU BESOIN DE FINANCEMENT DES ENTREPRISES"
Yves Estrade, Professeur à l'Ecole Supérieure de Commerce de Bordeaux, Expert Comptable.

Cette communication propose d'une part de faire le point sur les besoins de financement des entreprises, petites et moyennes et le développement de sociétés de capital risque, d'autre part, d'analyser les approches prévisionnelles destinées à évaluer les besoins financiers des entreprises en création et en développement et le processus d'exploration du futur des sociétés de Capital Risque.

"METHODOLOGIE MULTICRITERE D'EVALUATION DE L'INVESTISSEMENT EN CAPITAL RISQUE"
Jean Siskos, Professeur à l'Université Technique de Crète, Grèce, et C. Zopounidis, Chercheur au CEREG, Université de Paris IX Dauphine.

Cet article propose une méthodologie générale d'évaluation de l'investissement en Capital Risque, par usage d'un système interactif d'aide à la décision fondé sur l'utilisation interactive d'un modèle de régression ordinale. Dans un premier temps, les auteurs présentent un bref tour d'horizon des études en la matière et la méthodologie générale permettant l'évaluation d'entreprises. Ils développent ensuite une application réelle effectuée dans une société française de Capital Risque. L'étude a pour but essentiel la construction et la mise en place d'un modèle analytique de prévision et d'évaluation automatique d'entreprise.

"LES PERSPECTIVES CAPITAL RISQUE EN FRANCE"
Gilles Copin, Professeur au Groupe de l'Ecole Supérieure de Commerce de Lyon.

Cette communication a pour but d'explorer les futurs possibles du Capital Risque en France. Ce type de financement en fonds propres ne sera-til

qu'une mode? L'auteur a mené, au cours de l'année 1985, une enquête nationale auprès des institutions financières exerçant ce métier et des sociétés leur ayant ouvert leur capital. Il conclut que le Capital Risque a un bel avenir à condition que l'on surmonte les quelques pièges qui apparaissent déjà sur sa route.

RATIONAL EXPECTATIONS IN LARGE-SCALE MACROECONOMETRIC FORECASTING MODELS

Chair: Kenneth Wallis, University of Warwick, Coventry CV4 7AL, U.K.

Expectations of future values of endogenous variables, such as expected inflation or expected exchange rates, often appear among the explanatory variables in the constituent equations of macroeconometric models. If the expectations are assumed to be rational, then it is necessary to solve the model over the forecast period in an internally consistent manner so that expectations variables appearing in the model coincide with the model's forecasts. This talk introduces some of the issues that arise, and presents some results on the sensitivity of the solution path to alternative assumptions about terminal conditions.

"RATIONAL EXPECTATIONS FORECASTING IN PRACTICE USING THE LBS MACROECONOMETRIC MODEL"

Giles Keating, London Business School, Sussex Place, Regent's Park, London NW1 4SA, U.K.

The paper discusses the LBS model and its portfolio system for determining asset prices under rational expectation (RE). Practical aspects of RE forecasts are considered, including: choice of judgemental adjustments allowing for the simultaneous solution of all periods; estimates for the recent past where data exist for asset prices but not other variables; the jump in asset prices caused when the forecaster's projections for exogenous variables differ from the market's : the use of the model to locate a set of exogenous variables consistent with market views; the effects of future changes in market views about exogenous variables.

"FORECASTING WITH A LARGE MACRO MODEL INCORPORATING PERVASIVE CONSISTENT EXPECTATIONS : NIESR MODEL 8"

S. Hall, National Institute of Economic and Social Research, 2 Dean Trench Street, Smith Square, London SW1P 3HE, U.K.

In November 1985 the new NIESR Model 8 was used in a practical forecasting exercise for the first time. The model includes more than 40 foreward-looking expectations terms and is solved on the basis of consistent expectations. This paper discusses our experience in building and operating this model. General problems of solving and interpreting a model with consistent expectations are discussed, as well as more detailed practical matters such as determining exogenous variables, making residual adjustments, and solving the model in a forecasting round.

INCERTITUDE ET CHOIX DES INVESTISSEMENTS ELECTRIQUES

Chair: P. Penz, Professeur a l'Ecole Centrale des Arts et Manufactures, Paris, France.

"ON OPTIMAL EXCESS CAPACITY IN ELECTRIC POWER SYSTEMS"

J. Mosconi, Electricité de France, 2 Rue Louis Murat, 75384 Paris, France.

The problem at stake in this paper is the determination of the optimal capacity expansion a public firm must pursue when facing increasing returns to scale and random demand. Following AS Mann's earlier works, it is supposed that any equipment has an infinite economic life and that an amount of new capacity is installed whenever demand catches up with the existing equipments. The link between the optimal amount of new capacity and firm must install - to minimize cost - and the trend of demand is analyzed both in a determinist and a probabilist context.

In the first case, we emphasize the incidence of the discount factor, the returns to scale factor and the deand growth rate on the optimal capacity. The influence of distinct returns to scale factors - with respect to types of equipments - onto the capacity level is also analyzed.

In the second case, we suppose that the logarithm of the demand can be represented by a Wiener process. Hence, demand is growing yearly at a random rate whose mean and variance are known by the firm. The optimal capacity related to such a process demand is shown to be higher than in the determinist case and increasing with the variance level. The capacity size is thus shown to be positively correlated with the growth rate dispersion. furthermore, the probabilist model is proved to be in equivalence with a determinist one where the returns to scale factor would be increased. In a last paragraph, the incidence of lags betwen the investment decision and the actual setting for the equipment on the optimal capacity choice is emphasized.

"PRISE EN COMPTE DE L'INCERTITUDE DANS LE PROBLEME DE CHOIX DES INVESTISSEMENTS ELECTRIQUES"

Yves Sneers, Center for Operation Research and Econometrics, CORE, Louvain, Belgium.

On considère le problème classique du choix des équipements électriques dans un environnement caractérisé par des incertitudes sur la demande future, le prix des combustibles alternatifs, ainsi que des contraintes technologiques comme les possibilites de modulation des centrales nucléaires. Le problème est formulé comme un programme stochastique multipériode et traite numériquement comme tel. Differentes expériences numériques sont présentées ayant pour but de determiner systèmatiquement l'impact des différents types d'incertitude sur la stratégie d'investissement.

"GESTION ECONOMIQUE PREVISIONNELLE D'UNE SYSTEME ELECTRIQUE : DE NOUVEAUX OUTILS A ELECTRICITE DE FRANCE"

P. Torrion, EDF, 2 Rue Louis Murat, 75008 Paris, France.

La qualité des décisions d'investissement, l'effcacité d'un système tarifaire fondé sur les cuorts marginaux a long terme dependent pour une large part, de la capacite a apprehender les grandes caracteriquiques du systeme electrique futur.

Cette necessite s'impose aujourd'hui avec d'autant plus de force que le systeme francais est le siege d'une double evolution:

- d'une part, une offre progressivement dominee par le nucleaire qui satisfera a lui seul les besoins d'electricite pendant une grande partie de l'annee,
- d'autre part, une demande d'hiver de plus en plus sensible aux variations de temperature, fortement aleatoires et largement imprevisibles dans un pays comme la France.

La gestion previsionnelle reqiert donc des outils nouveaux, adaptes a un univers fortement aleatoire, et capables opur l'essentiel d'optimiser la gestion conjointe de moyens de regulation tres divers, du cote de l'offre comme du cote de la demande.

Apres une description rapide de ces outils, on s'attache à montrer en quoi l'utilisation de tels outils permet, d'une part de préciser notre connaissance de l'équilibre offre-demande d'electricité, constitue d'autre part, une aide précieuse pour déterminer un dimensionnement adapté des equipements de production futurs et pour orienter le développement du système tarifaire dans le sens de l'interêt collectif.

SOME RECENT DEVELOPMENTS IN MODELLING AND PREDICTION OF MULTIPLE TIME SERIES

Chair: G. Mélard, Université Libre de Bruxelles, CP 210, Campus 5890, B-1050 Brussels, Belgium.

"ON A MULTIVARIATE STATISTICAL CLASSIFICATION MODEL"
A. Gupta, Bowling Green State University, Ohio, USA

Classification procedures, based on the maximum-likelihood criterion, for classification into one of two multivariate populations when multiple observations are available on the same variable for each individual, have been studied in the present paper. The distribution of the classification statisitics is derived and the probability of misclassification, exact and/or approximate, is given when the parameters are known as well as when they are unknown. These procedures are then extended to more than two populations.

"INFLATION TAUX D'INTERET ET MONNAIE EN BELGIQUE : UNE ANALYSE DE CAUSALITE"
K. Sekkat, Département d'Economie Appliquée de L'Université Libre de Bruxelles, Avenue F. Roosevelt 50, 1050 Bruxelles, Belgium.

Nous testons par une analyse de causalité multivariée des relations, généralement imposées a priori sur base de schémas théoriques, entre variables macroeconomiques d'une petite économie ouverte. A partir du schéma causal ainsi obtenu, le modèle est estimé par la technique Box-Jenkins multivariée. L'analyse porte sur des donnees mensuelles belges : prix à la consommation, prix à l'importation, taux d'intérêt à court terme, masse monétaire, et un indicateur d'excès de demande.

"FITTING MATRICES TO MARGINAL FORECASTS"
Dr. D. Nash, Mathematics and Computer Science Department, Drexel University, Philadelphia, PA 19104, USA.

Certain planning and forecasting systems used in government and industry require adjusting entries in a given matrix of current values (such as sales by region) so that row and column sums agree with given targets, or marginal forecasts. The adjusted entries may be useful as forecast values consistent with the given row and column targets.

A fast, one-pass algorithm based on Kronecker products is presented to solve the least squares case for weighted rows and columns. Also, a simple iterative algorithm that preserves zeros and positivity of entries is given.

PREVISION ET MARKETING II

Chair: Rudolf Lewandowski, Marketing Systems, Germany.

"SANOFI FRANCE"
M. Dejeante et M. Archambean, Sanofi, France

La societe SANOFI, comprenant une trentaine de sociétés réparties dans des secteurs différents, a pris la décision d'équiper d'un système de prévision les principales societes du secteur pharmacie.

Le systeme de prévision doit non seulement ameliorer le travail de prévision traditionnel et soutenir les opérationnels par des analyses systematiques, mais aussi alimenter la production en prévisions au niveau de chacun des produits. Pour les cinq principaux laboratoires, compte tenu des differences au niveau des produits et des marchés, il a été opté pour:

. une solution centralisée permettant de gérer environ 20.000 séries,
. une solution suffisamment souple permettant de générer des méthodes spécifiques à chacun des laboratoires. Il s'agit ici d'une nouveauté en matière de prévision.

Afin d'atteindre un maximum de facilité au niveau de l'utilisation, il a été aussi décidé de mettre les systèmes de prévision à la disposition de chaque laboratoire sous PC avec des interfaces automatiques avec le site central. Les problèmes de communication et de compatibilité entre plusieurs utilisateurs PC et le site central ont été ainsi résolus.

"HILTI"
Dr. Fritz Meier, Hilti, Luxembourg.

La société HILTI commercialise du matériel et des milliers d'articles professionnels pour le batiment. Depuis plusiers annees, des efforts particuliers ont été entrepris pour mettre en place un système de logistique. Compte tenu de l'importance de la fiabilite des prévisions pour la gestion des stocks et de la production, la société HILTI a décidé en 1984 de developper un module prèvisionnel capable de répondre aux impératifs suivants :

Traitement d'un nombre important d'articles.
Introduction et quantification automatique d'actions et d'événements spéciaux.
Gestion automatique de paramètres.
Méthodologie efficace et simple d'utilisation.

Le choix de la societe HILTI s'est porté sur FORSYS au debut de 1985. Après une adaptation du système aux spécificités de HILTI, nous estimons que la reduction de l'insécurité prévisionnelle pour l'ensemble des articles est d'enviror 15 a 20%.

"EXPERIENCE EUROPEENNE DE PREVISION EN MARKETING"
R. Lewandowski, Marketing Systems, Germany.

L'objet de cette presentation est de resumer l'experience de l'auteur en matiere de prevision dans des societes europeennes. Des utilisateurs de prevision participeront a la discussion sous forme de table ronde.

PRACTICAL ASPECTS OF FORECASTING

Chair: Dr. Hans Levenbach, President, Core Analytic Inc. 674 Route 202-206 Nth, Bridgewater, N.J. 08807, USA

"LONG TERM FORECASTING REEXAMINED"
Peter Graff, Feldmuhle, Aktiengesellschaft, Dusseldorf, Germany.

A method of making long term economic forecasts is explained using a new trend function which has hitherto not been employed and using a non-stochastic extrapolation approach. A selection of ten, approximately ten years old, forecasts made with this method is re-examined.

"CHOOSING THE 'RIGHT' FORECASTING MODEL"
Chris Chatfield, School of Mathematics, Bath University, Bath, U.K.

Experienced statisticians generally subject data to an informal initial examination (abbreviated IDA for Initial Data Analysis) in order to get a 'feel' for the data, detect oddities, summarise the data and formulate a model. This talk discusses the use of IDA in time-series modelling. The main tool is the time plot. Without an IDA, it is easy to choose the 'wrong' model as will be demonstrated in several real-life examples, involving the Box-Jenkins approach and Holt-Winters seasonal forecasting.

The choice of smoothing parameters in exponential smoothing is a rather different matter. The talk will discuss how far this can safely be done on the basis of an IDA.

"UNE APPROCHE BASEE SUR LA REGRESSION MOBILE ET DES INDICATEURS AVANCES POUR PREVOIR LES DEPARTS VOLONTAIRES DANS LES FORCES ARMEES CANADIENNES: UN PROGRAMME AUTOMATIQUE DE PREVISION"
Marcel Lebreton, Operational Research and Analysis Establishment, Department of National Defence, Ottawa, Ontario KIA OK2, Canada.

La prévisions des départs volontaires (i.e. militaires demandant pour etre liberes des Forces Armees) est une étape cruciale dans le processus de recrutement et d'entrainement. Au départ, deux postulats furent posés: (1) les départs volontaires sont fortement influencés par les fluctuations économiques et (2) les départs volontaires sont également influencés par leur passé (autoregressif). A partir de là, il y a eu 4 étapes. La premiere étape consiste en l'analyse des sèries mensuelles des departs volontaires à l'aide de diverses méthodes dont l'analyse spectrale. La deuxieme étape fut celle où il fut établi la très forte colleration existant entre les départs volontaires et les séries économiques. Des équations prèvisionnelles furent alors réalisées. La troisième étape fut celle où la structure du modele prévisionnel fut etablie. Le modèle prévisionel utilise des équations mixtes (variables economiques plus termes autorégressifs) de régression mobile pour les prévisions ponctuelles et un indicateur avancé pour prévoir les points de retournement (sommets et creux). La quatrième étape fut celle où le modèle prévisionnel a été intégré a un programme (écrit en langage APL) informatique. Une fois les données mises à jour, le programme calcule automatiquement les prévisions et les imprime. Ainsi

l'utilisation en est simplifiée au maximum pour l'utilisateur qui n'a aucunement besoin de connaitre le fonctionnement interne du modèle. Enfin, les résultats démontrent des erreurs de prévision très faibles, de l'ordre de 3% pour une prevision faite 5 mois a l'avance. De plus, les prévisions des points de retournement faites par l'indicateur avancé coincide avec les prévisions des équations de regression mobile.

"INFORMATION AS A COMMODITY"

Richard K. Curtis, Professor of Speech and Communication, Indiana University, Indianapolis, Indiana, USA

A solution to the problem of measuring information as a commodity continues to elude economic forecasters in this information age. This paper suggests that treating information as a special case of energy may offer a means of measurement. Goods and services, regarded as material and kinetic energy respectively, are comparatively easily measured. But when it comes to informational energy there appears little way of measuring it as a commodity apart from the traditional quantifying of information by Claude Shannon in a neutral fashion that made possible the advent of the modern computer. By attaching the hierarchy of values to information, perhaps there is a way of measuring it and forecasting it as a commodity.

METHODS OF TELECOMMUNICATIONS FORECASTING SYSTEMS

Chair: M. Jambu, CNET, France

"FORECASTING DEMAND FOR INTERNATIONAL TELEX TRAFFIC"

H. K. Leung, Cable and Wireless (Hong Kong) Ltd. New Mercury House, 22 Fenwick Street, Hong Kong.

The effect of new services on international telex traffic is becoming increasingly significant. Forecasting of international telex traffic without considering the effect from new services would be fatal. This paper describes how telex migration is tackled in Hong Kong and present two models for forecasting of international telex traffic, one for outgoing and one for incoming, which take into account of telex migration, and discusses how forecasts are produced from the models.

"IMPROVED FORECASTS FOR LOCAL TELECOMMUNICATIONS NETWORK PLANNING"

M. Tu and C. D. Pack, Bell Communications Research, Navesink Research and Engineering Centre, 331 Newman Springs Road, Red Bank, New Jersey 07701-7020, USA.

Forecasts of "demand" for the spectrum of network services are the most important ingredient in local telecommunications network planning. However, because the problem has many attributes that may be unique to telecommunications, it has not received widespread attention in the literature. Most existing procedures are based on the Kuithof projection technique, first documented in 1937, which is simple to apply but has almost none of the usual desirable statistical attributes. In this paper, we use modern estimation procedures, based on the Kalman filter, to combine in one robust, near-optimal forecast model both aggregate and source-to-destination (often called "point-to-point") demands on a local telecommunications network.

"MODELLING SPECIAL SERVICE DEMAND BY INDEPENDENT STABLE INCREMENTS"

Werner A. Stahel, Swiss Federal Institute of Technology (ETH), Zurich and Patricia Grambsch, Mayo Clinic, Rochester, MN, USA.

Traditional ARIMA methods and, lately, a simple Kalman Filter model have been used to forecast demand for Special Services in the telecommunication business. Instead, we have applied the simple model of independent increments with long-tailed (stable) distributions to a large set of pertinent monthly time series. We found a quite satisfactory fit of the model and improved forecasting results. The model also helps for estimating the distribution of the forecasting errors, which may be more crucial for the success of the planning process than the point forecasts.

"FORECASTING TELECOMMUNICATIONS DEMAND AND REVENUE"

Dan Kratochivl, 6829 Wemberly Way, McLean, VA 22101, USA.

The purpose of this presentation is to explain how nation-wide demand forecasts were developed and are being used to estimate the revenue value of originating and point-to-point traffic. It is expected that such estimates of revenue value will be utilized by both providers of telecommunications

services (e.g., for investment planning) and regulators of such services (e.g., for taxing purposes).

The forecasts of demand and estimates of revenue value to be described are unique in that they were based on both a national and local perspective. To accomplish this, the forecasts were developed using three separate processes:

1. One dealt with developing national demand forecasts.
2. The second dealt with distributing this demand around the nation (United States), so that the amount of originating traffic by area and point-to-point traffic could be determined.
3. The third dealt with determining the revenue value of the originating and point-to-point traffic.

These three steps will be described. Examples of forecasts of demand and estimates of revenue value will be presented and procedures for updating the relevant data bases will be discussed. Implications for utilizing these procedures in other countries will be examined.

MODELISATION ECONOMETRIQUE DU DESEQUILIBRE

Chair: Patrick Artus, Banque de France, France

"A DISCUSSION OF BELGIAN UNEMPLOYMENT COMBINING TRADITIONAL CONCEPTS AND DISEQUILIBRIUM ECONOMETRICS"

H. Sneessens, Faculté Libre des Sciences Economiques de Lille, France and J. Dreze, CORE, Université Catholique de Louvain, Belgium.

In a first part, the paper reviews some salient facts, about employment in Belgium since 1974, and singles out (i) the sharp increase in productivity and decline in employment for the manufacturing sector; (ii) the sustained growth of real wages through the seventies.

In a second part, we present and discuss a two-market macroeconomic rationing model, based on previous work by Sneessens and Lambert, augmented by simple price and wage equations. Prices are determined by a mark-up on costs, with a positive demand pressure effect. Real wages are determined by productivity gains, with a negative unemployment effect. The economy is modeled as a time-varying mixture of micromarkets in Keynesian unemployment, Classical unemployment and repressed inflation respectively.

In the third part, a seven-equation specification of that model is estimated from annual data, 1954-82. As a by-product, non-inflationary levels of unemployment and fiscal stance are obtained, and the observed level of unemployment is imputed back to its causes : an insufficient capital stock, structural mismatch and insufficient demand each account for some 30% of the observed level in 1982; whereas the need to offset inflationary pressures at macroeconomic equilibrium accounts for the remaining 10%.

"DESEQUILIBRE GENERAL ET INVESTISSEMENT"

A. d'Autume et P. Michel, Université Paris I, France.

L'objet de ce papier est l'étude du comportement d'investissement en dèsèquilibre dans un modèle macroéconomique intertemporel complet. La conjonction d'une formulation pleinement rigoureuse du comportement du producteur et d'une représentation simplifiée des choix du consommateur rend possible l'étude analytique du modèle en prévision parfaite, c'est-à-dire l'étude d'une dynamique ou le comportement d'investissement est determiné par les contraintes quantitatives prévues mais ou celles-ci sont celles qui decoulent effectivement des interactions entre agents.

"MODELES MACROECONOMIQUES DE DESEQUILIBRE INVESTISSEMENT ET ENQUETES DE CONJONCTURE"

J. Lambert, Faculté Libre de Sciences Economiques, Université Catholique de Lille, France, et CORE, Louvain-la-Neuve, Belgium.

Ce papier présente la méthodologie d'utilisation des enquêtes de conjoncture dans l'estimation de modèles macroéconomiques de déséquilibre. Ces modèles macroéconomiques de déséquilibre sont obtenus par agrégation de micro-marches en situation de déséquilibre et ont la particularité de générer pour les quantités echangées un lissage de l'offre et de la demande. Le papier donne aussi les résultats d'une recherche visant a incorporer le

comportement d'investissement dans les modèles de rationnement, toujours en exploitant l'information fournie par les enquêtes de conjoncture.

"A FRAMEWORK FOR DISEQUILIBRIUM MODELLING"
Chris Martin, Birkbeck College, UK

This paper develops a disequilibrium model that allows trade to be dispersed among many submarkets that may be in either excess demand or excess supply. I begin with a simple model, closely based on Nickell (1984), and elaborate this to allow for spillover effects and the presence of more than one aggregate market. I show that the general model specialises, under certain easily testable restrictions, to either the equilibrium or the aggregate min models and discuss the way in which this model is a generalisation of both these models. Finally, I briefly consider a possible role for business survey data.

"INVESTISSEMENT, EMPLOI ET CONTRAINTE EXTERNE : UN MODELE DE MOYEN TERME"
J. Laffargue, CEPREMAP, France.

Ce papier présente un modèle à deux secteurs. Le premier est exposé à la concurrence internationale, ne subit aucune contrainte de débouchés et se voit imposer son prix par l'étranger. Le second est abrité de la concurrence étrangère et rationne dans ses débouchés; afin que les deux regimes puissent coexister durablement, il faut que le prix relatif des deux biens soit indépendant de l'ampleur des desequilibres. On retient une perspective de moyen terme, ce qui requiert la formalisation de comportement d'investisement qui modifie les capacitès de production. On examine successivement la trajectoire de croissance equilibree, les effets des politiques de revenus et budgétaire, les combinaisons de politiques qui ameliorent la production et l'emploi en maintenant l'équilibre de la balance commerciale.

EVALUATION DU RISQUE POLITIQUE : METHODOLOGIE

Chair: Serge de Klebnikoff, Thomson-CSF, Vice President de l'Association Francaise des Analystes de Risques-Pays (AFAR)

"L'ENTREPRISE FACE AU RISQUE POLITIQUE"
Jacques Anthonioz, Association Française des Economistes d'Entreprise.

Les sources d'informations : organismes officiels, banques et consultants, réseaux personnels.

Les degrés du risque politique en fonction des opérations à effectuer et de l'entreprise concernee.

:Les garanties : assurances diverses, minimisation des couts.

"RISQUES-PAYS ET DIVERSIFICATION INTERNATIONALE DE L'ENTREPRISE"
Bernard Marois, Professeur au Centre HEC/ISA, Secrétaire Général du Club Finance Internationale.

Il y a deux façons de prendre en compte le risque-pays dans la politique de dèveloppement international de l'entreprise : soit au niveau de chaque project d'investissement, à l'aide de techniques financières classiques (utilisation d'une "prime de risque" ou d'un "coéfficient d'ajustement au risque") ; soit, au niveau mondial, en pratiquant une diversification internationale du risque, selon la théorie de la gestion de portefeuille. Comment peut-on reconcilier ces deux approches, au niveau de la strategie d'internationalisation de l'entreprise?

"L'EXPORTATEUR, L'INVESTISSEUR ET LE BANQUIER FACE AU RISQUE POLITIQUE"
Jean-Louis Terrier, Directeur General de Nord Sud Export Consultants

Face aux risques-pays, l'exportateur et le banquier sont-ils des investisseurs qui s'ignorent?

Pourquoi l'approche bancaire des risques-pays est-elle inadéquate pour rendre compte de la nationalité d'un projet industriel?

Quand est-il nècessaire d'envisager une étude de risque politique?

Ou exporter, ou prêter, ou investir : s'agit-il de questions qui doivent necessairement recevoir des reponses dichotomiques?

ECONOMIC FORECASTS AND MODELS

Chair: David Smyth, University of Liverpool, Myrtle Street, PO Box 147, UK

"ANALYSIS OF MODEL-BASED FORECAST ERRORS"

Kenneth Wallis and John Whitley, ESRC Macroeconomic Modelling Bureau, University of Warwick, Coventry CV4 7AL, UK.

This paper considers the errors in four forecasts of the UK economy made in late 1983. The forecasts are those of four groups whose models and databases are deposited at the ESRC Macroeconomic Modelling Bureau, namely the London Business School, the National Institute of Economic and Social Research, the City University Business School and the Liverpool University Research Group in Macroeconomics. In each case the impact on the forecast errors of different assumptions about external developments, the forecasters' residual adjustments, model differences, and data revisions is assessed.

"MARKOVIAN FORECAST PROCESSES"

Roman Krzysztofowicz, Department of Systems Engineering, University of Virginia, Charlottesville, Virginia 22901, USA.

A sequential forecast process arises when forecasts of a fixed but uncertain state are prepared with decreasing lead times, each subsequent forecast incorporating additional information and, therefore, updating the previous forecast. We investigate Bayesian Markov models of such a process for purposes of rational decision making. The Markov structure, although not universally valid, seems plausible, leads to tractable models, and implies sequential sufficiency of forecasts (roughly speaking, each subsequent forecast is less uncertain than the previous one). Sequential sufficiency, in turn, has implications on modeling Markov stopping-control processes.

"MODELS RANKING AND FORECASTS COMBINATION : A HIERARCHICAL APPROACH"

Q. Duong, Bell Canada and the University of Western Ontario, London, Ontario, Canada.

The current debate on the relative merits of Model Selection versus Synthesis in forecasting is reviewed first; then, by modelling the forecasting process as a hierarchical procedure of decision making, it is argued that the 'real' question is not whether one or the other of the two approaches is adopted, but is whether some degree of consistency has been achieved. The Analytic Hierarchy Process (AHP) method due to Saaty is suggested as a practical way of implementing the forecasting process. It is shown that the "Minimum Forecast Error Variance" set of weights could be derived as a 'special' case of AHP. Furthermore, the use of model selection criteria (e.g. AIC, BIC) as relative weights of evidence (or likelihood) of competing models in time series analysis is also shown to be a natural application of AHP; in particular, this leads to the consideration of 'subset' of models for forecasting purposes (Duong 1984 and Poskitt and Tremayne 1985).

"A FORECASTING MODEL FOR THE CONSTRUCTION INDUSTRY"

Francois Uyttebrouk, Chase Econometrics; Marc Lauwers, Confederation Nationale pour la Construction and Marc Rosiers, Confederation Nationale pour la Construction Belgique, Belgium.

The comobel has been developed to analyse new house construction and its interactions with various narrowly related markets.

The model explains the behaviour on the market for new residential construction and its links with demand and sale prices for existing houses, renovation and demolishment activity, sales on the arable land market and demand and prices for rented houses.

The links with the capital market, i.e. the market of mortgage loans, are explicited

The model is of particular interest for theoretical and practical reasons. Theoretically because it is a micro-economic general equilibrium econometric model. Practically because it explains and forecast developments on all construction related markets, of interest for bankers, real estate investors, metals producers, non-ferrous minerals companies, insurance companies and all others having the construction as a client industry.

The model was first used in Belgium by the 'Confederation de la Construction Belge' in their negotiations with the government on the determination of effects of indirect tax increases and fiscal stimulation measures.

NOUVELLES VOIES DE LA PREVISION SOCIO-ECONOMIQUE II

Chair: E. Fontela, Université de Genève, Universidad Autonoma de Madrid, Spain.

"ANALYSE INPUT-OUTPUT ET PROSPECTIVE"

E. Fontela, Université de Genève, Universidad Autonoma de Madrid
Antonio Pulido, Universidad Autonoma de Madrid, Spain.

L'analyse input-output a toujours fait partie des grands modeles d'exploration a moyen terme. Le probleme principal a ete celui de l'evolution des coefficients techniques et plusieurs methodes ont ete testées. On examinera successivement ces différentes méthodes (ex-ante, RAS, extrapolation, relations economètriques) et leurs limites, en particulier en relation avec le nouveau paradigme technologique de l'information et des communications. L'extension de l'approche input-output pour inclure les matrices de consommation et d'investissement sera traitée comme une extension importante du point de vue de l'analyse du progrès technique.

"INPUT-OUTPUT ANALYSIS AND FORECASTING"

E. Fontela, Université de Genève, Universidad Autonoma de Madrid
Antonio Pulido, Universidad Autonoma de Madrid, Spain.

Input-output analysis has always been a key element of medium term exploratory economic models. The main problem in this context relates to the evolution of technical coefficients. Several methods have been developed and tested and they will be described in the paper (ex-ante, RAS, extrapolation, econometric models); their limitations will be analyzed, with special reference to the difficulties encountered to take into consideration changes in information and communication technologies. An extension of input-output analysis in order to include consumption and investment matrices will also be treated; from the point of view of the analysis of technical progress, these extensions are raising many positive expectations.

"NOUVELLES METHODES DE PROSPECTIVE TECHNOLOGIQUE"

T. Gaudin, CPE, 1 rue Descartes, 75231 Paris, France.

La prospective de la rupture exige une autre logique. La continuité permettait de prévoir en prolongeant le récent. La rupture demande une analyse structurelle, qui se refuse aux mutations comparables du passé, même lointain.

C'est ce à quoi conduit l'examen du système technique contemporain, dont la mutation peut etre comparée à la révolution industrielle du 18eme siècle ou à celle du 12eme siècle.

Mais, en dessous de cette analyse, se pose la question des structures qui permettent de rendre ces transformations intelligibles.

"LA PROSPECTIVE AU SERVICE DE LA PREVISION ET DE LA PLANIFICATION"

Michet Godet, Professeur Associe de Prospective industrielle au Conservatoire National des Arts et Metiers, 2 rue Conte, 75003 Paris, France.

Toute tentative de pré-vision ou de pré-diction de l'avenir est une imposture car l'avenir, multiple et indeterminé, n'est écrit nulle part et reste à faire. La prospective a précisément pour objet de mettre en lumière les futurs possibles (futuribles) afin d'eclairer l'action prèsente et de lui donner un sens car "il n'y a pas de vent favorable pour celui qui ne sait ou il va" (SENEQUE)

En Europe, la crise de la prévision et de la planification s'est accompagnée d'un essor de l'approche prospective. Le temps nous parait venu de décloisonner la réflexion stratégique et d'innover en exploitant et les synergies entre des approches dont les limites sont complémentaires.

Nous nous attacherons à formuler les recommandations indispensables pour mettre la prospective au service de la prévision et de la planification.

1. tirer parti des enseignements du passé;
2. décrypter les informations à la lumière des jeux du pouvoir;
3. remettre en cause les idées reçues;
4. miser sur le virage social pour réussir le virage technologique;
5. transformer les structures et les comportements;
6. équilibrer la structure stratégique: le triangle Grec;
7. considérer les méthodes comme des outils de réflexion et de communication;

"FUTURE STUDIES, A USEFUL TOOL FOR FORECASTING AND PLANNING"

Michel Godet, Associate Professor of Industrial Future Studies at the Conservatoire National des Arts et Metiers, CNAM, 2, rue Conté, 75003 Paris, France.

All attempts at forecasting or prediction are necessarily foolhardy, for the simple reason that the possible futures are as yet undetermined i.e. are unwritten. The scope of future studies is to shed light on these possible futures, thereby clarifying and justifying present action. "What use is a wind without a heading?"(SENECA).

In Europe, the apparent failure of both forecasters and planners is offset by the emergence of proponents of a future studies approach : la prospective. It now seems an opportune time to bring strategic thinking to the fore and to innovate through a conjugate, synergetic, approach.

We set out some guidelines for potential users of "la prospective" in forecasting and planning.

1. to draw on past experience;
2. to decrypter information in terms of balance of power relationships;
3. to reappraise former standpoints;
4. to benefit from the social revolution in order to successfully negotiate the advent of the techno-wave;
5. to modify behavioural patterns;

6. to balance out strategic structures: viz., the Greek triangle.
7. to consider the methods outlined as tools for reflexion and communication.

"L'ANALYSE ECONOMIQUE ET DEMARCHE PROSPECTIVE DE L'ENTREPRISE"

A. Merlin, Saint Gobain, Les Miroirs, 18 Avenue d'alsace, 92400 Courbevoie, France.

Les besoins d'analyses économiques concrètes, aptes à aider les dédideurs, sont en plein bouleversement, mais les outils traditionnels ne sont pas adaptés aux nouvelles demandes. Le decalage s'accroit de jour en jour. Parmi les multiples questions qui affleurent, l'évolution des modes de vie, des techniques et des matèriaux, le dosage des ingrédients de la croissance offrent un champ immense d'investigation. Cela passe notamment par un développement de l'analyse microéconomique, que l'informatique favorisera. Cela suppose ausst de bons économistes, dans l'entreprise et hors de l'entreprise. Et surtout une obsession de l'information, conçue comme arme stratègique. Il y a là un défi, mais aussi une perspective passionnante pour les économistes soucieux de développer le caractère opérationnel de leur discipline.

"INTEGRATING ENVIRONMENTAL INTELLIGENCE IN A STRATEGIC PLANNING PROCESS"

K. Valaskakis, Professeur titulaire d'économie, Université de Montréal, Canada.

One of the principal cause of strategic surprise leading to great planning failures is faulty environmental intelligence. The intelligence is "faulty" in one of three respects:

a) It is incomplete;
b) It is inaccurate;
c) It is complete and accurate but has been internalized. There is "data" but not intelligence.

In order to improve the strategic performance of firms and/or government agencies, a process has to be developed to improve the integration of environmental intelligence in planning. A method to achieve this result will be presented.

FORECASTING FINANCIAL VARIABLES

Chair: R. D. Nair, University of Wisconsin, USA

"A KNOWLEDGE-BASED EXPERT SYSTEMS MODEL OF AUDITORS' FORECASTS OF GOING-CONCERN PROBLEMS"

Stanley F. Biggs and Mallory Selfridge, The University of Connecticut, Storrs, Connecticut 06268, USA.

GC-X is an initial, prototype expert system that makes going-concern judgments. The purposes of the research have been to develop a model of an expert auditor making going-concern judgments, and to develop a plausible framework for future detailed work. Based on the literature and interviews with two experts, the GC-X system incorporates six types of knowledge: (1) knowledge of how to measure financial performance; (2) knowledge of how to use measures of financial performance to make going-concern judgments and how to explain the judgment; (3) knowledge of the target firm's business and its environment; (4) knowledge of how to use and explain business and environmental knowledge in making going-concern judgments; (5) knowledge of how to link business and environmental factors to financial performance; and (6) knowledge of how to use business and environmental and financial knowledge to evaluate management plans.

The system has been programmed in LISP and operates on a VAX 11/780 computer. GC-X has three system modules (a rule-based system that operates on financial knowledge; an event-chain network system that operates on business and environmental knowledge; and a plan evaluator that operates on both financial knowledge and business and environmental knowledge) and three databases (financial statement facts and facts concluded by the system; financial and judgment rules; and business and environmental events). GC-X is goal oriented in that it works on goals and subgoals in a goal-stack that is initialized with the goal to assess whether a company is a going-concern. GC-X will make judgments directly from data in its databases, or it can operate interactively with a user. GC-X has a simple natural language interface that allows it to interact with the user, and the ability to explain its reasoning to the user.

"PATTERNS IN SECURITY ANALYSTS' FORECASTS OF CORPORATE EARNINGS"

Kamal M. El-Sheshai, Georgia State University, Atlanta, Ga., USA

Forecasting the future values of corporate earnings has long been a pursuit of both security analysts and academicians. In search for models which capture market expectations of future earnings a number of studies devoted their attention to modeling past corporate earnings. Recent studies have shown that advance knowledge of security analysts' forecasts is more valuable than advance knowledge of earnings per se. This study analyses and models security analysts' forecasts of earnings per share for a sample of 64 firms. Analysts' forecasted series are modeled via the ARIMA methodology. The sample data covers 60 quarters ending fourth quarter 1982. The results indicate a great deal of similarity between models of analysts' forecasted data and models of the actual earnings. Furthermore, the study shows that analysts' forecasts could be predicted with about the same degree of accuracy as forecasting actual earnings.

"INFORMATIONAL IMPLICATIONS OF UNCERTAINTY IN ACCOUNTING EARNINGS"

Eugene Imhoff, University of Michigan; Gerald Lobo and R. D. Nair, University of Wisconsin, USA

This paper examines the information content of earnings forecast errors and the uncertainty of earnings forecasts. Prior research has demonstrated a relationship between unexpected security price movements and earnings forecast errors. The theoretical premise being explored here is that the differential uncertainty in the earnings forecasts of each firm may incrementally explain unexpected security returns.

We use the dispersion of analysts' earnings forecasts to represent the uncertainty in the earnings forecasts. Both the forecast error measure and the variation in the analysts' forecast are deflated by measures of variability in each firm's historical earnings series. The null hypothesis that the amount of uncertainty in analysts' forecasts does not incrementally explain unexpected security returns is examined using regression analysis. We also consider the information content of the interaction between forecast error and forecast uncertainty.

"AUDITOR CHANGES AND BANKRUPTCY PREDICTION"

David Shields, Assistant Professor of Accounting and Brian Kluger, Visiting Assistant Professor of Economics, Rice University, Houston, Texas, USA

With clients in financial distress situations, CPAs may be torn between reporting optimistically, thus improving the client's chances for recovery, and reporting pessimistically, perhaps delivering a self-fulfilling prophecy. Recent intensification of the auditor's legal exposure, coupled with an intensely competitive market for audit services, has placed further pressure on the professional judgment of the auditor. Under conditions of financial distress, management has incentive to delay or suppress dissemination of unfavorable information about the company. This may result in attempts to convince the CPA to provide 'favorable' accounting treatment, as well as threats to replace the auditor if he resists. The purpose of this paper is to examine whether auditor changes are predictive of impending bankruptcy. Recent work by Schwartz and Menon (The Accounting Review, April, 1985) has shown that the frequency of auditor switches by companies that will soon go bankrupt far exceeds that of all companies, but are unable to provide any evidence of direct effects of auditor switching on suppression of information by management. This paper presents such a study, and concludes that, if the auditor switch had any effect on reported financial results, that effect is not reflected in financial variables commonly used to predict impending financial failure.

EVOLUTION DES TAUX D'INTERET ET EVALUATION DES OBLIGATIONS

Président : Christian Bito, Enseignant Responsable du Département Finance de l'ESSEC, Directeur Adjoint du programme de Mastère de Techniques Financières de l'ESSEC.

L'âge d'or où les taux d'intérêt étaient d'un faible niveau et restaient quasiment constants est définitivement révolu depuis le début des années 1970.

Avant, pour trouver le prix d'un emprunt on pouvait se contenter d'actualiser les flux ou paiements futurs à partir des taux observés aujourd'hui pusiqu'il n'y avait pas de raison qu'ils se modifient.

Maintenant, le prix des obligations dépend de l'évolution des taux d'intérêt. Prévoir le prix d'une obligation consisterait donc à prévoir les taux d'intérêt.

Malheureusement, prévoir exactement la valeur des taux d'intérêt relève de la pure utopie.

Néanmoins, les développements de la théorie financière moderne permettent, grâce aux modèles d'arbitrage, d'expliquer et de prévoir le prix des obligations grâce :

- au niveau présent des taux
- aux caractéristiques d'évolution aléatoire des taux.

En effet, puisque personne ne peut prétendre prévoir les taux futurs, il est logique de penser que les prix à l'équilibre s'établissent en fonction des anticipations, de l'incertitude et de la volatilité (propension des taux à varier) des taux.

Mr. Dumas explique comment on aboutit à l'évaluation théorique du prix des obligations en fonction de l'évolution stochastique des taux d'intérêt.

Mr. Bito présente une application pratique de la prévison du prix des obligations et de son utilisation dans la gestion obligataire.

Mr. Poncet montre enfin comment on peut se couvrir contre le risque de taux d'intérêt en utilisant les nouveaux instruments financiers à terme.

"MODELE DE GESTION OBLIGATOIRE PRATIQUE ALLIANT EVALUATION THEORIQUE ET STATISTIQUE DESCRIPTIVE"

Christian Bito, Enseignant responsable du Département Finance de l'ESSEC, Directeur Adjoint du programme de Mastère de Techniques Financières de l'ESSEC.

"PANORAMA DES METHODES D'EVALUATION DES OBLIGATIONS"

Bernard Dumas, Professeur de Finance à Wharton (University of Pennsylvania) et au Centre HEC-ISA.

"OPTIMAL INVESTMENT AND HEDGING WITH LONG TERM INTEREST RATE FUTURES : A THEORETICAL ANALYSIS"

Patrice Poncet, Professeur de Finance à l'Université Louis Pasteur de Strasbourg et à l'ESSEC.
Roland Portait, Finance Department ESSEC.

The objective of this research is to investigated the behavior of financial futures market. The paper is organized as follows. In the first section, we derive the individual investor's optimal portfolio decisions in a standard discrete time model where decisions are myopic. We prove that, in such a model, if it is assumed, as in the standard CAPM, that investors have the same investment horizon and homogeneous expectations, the futures market is in fact inactive at equilibrium. In the second section, we build a continuous time model in which individuals maximize their lifetime expected utility by using dynamic programming in an environment caracterized by a stochastic investment opportunity set. In such a context, the standard CAPM does not hold and the futures market is reactivated. In addition, if the stochastic change in the investment opportunity set is reduced to the change in the short term interest rate, a three-funds separation theorem can be proven which enlights the role played by the futures market. Section three summarizes the main results and paves the way to further research.

OPEC AND ENERGY DEMAND

Chair: Carmen Matutes, INSEAD, Bld. de Constance, Fontainebleau, France.

"PROBABILISTIC FORECAST OF LIGHT TO HEAVY CRUDE OIL DIFFERENTIALS"
Andrew J. Lipinski, Senior Research Fellow, Institute for the Future, 2740 Sand Hill Road, Menlo Park, CA 94025-7097, USA.

An assessment of the 1985-1990 production levels of medium, light and heavy crudes given possible developments in the Middle East was translated into probability densities of price differentials. A group of experts assigned probabilities, direct and conditional, to five developments within three time periods within the time horizon. Each of the resulting 256 outcomes was assigned three equally likely production levels.

Another group of experts supplied inputs to a dynamic cross-impact model of the industry, which then was run through a sample of production levels, yielding a regression equation. When run across the entire tree, the equation produced probability differentials for each time period.

"ENERGY FORECASTING FOR SOUTH AFRICA"
Dr. Pe Van Der Dussen, National Research Institute for Mathematical Sciences, Council for Scientific and Industrial Research, Pretoria, Republic of South Africa

Forecasting energy demand and its composition by energy type is necessary for physical and economic planning. Total energy demand and its allocation to energy sources are functions of the size and structure of economic activity, energy prices, and technology. Proper energy forecasting therefore requires future scenarios for these variables.

The long-term economic growth trend of South Africa changed from a stable exponential annual rate of 4,5% from 1921 to 1971 to linear growth up to 1981 and at best zero afterwards. At the same time the economic structure of South Africa has changed considerably since 1950, with the secondary sector increasing its part in the total economy from around 12 to 25% and more, mainly at the relative expense of farming. Both aspects have to be accounted for in scenarios of the economic future.

Energy prices in South Africa are necessarily affected by international movements. However, policy and related considerations affect the user prices of the various energy types to a great extent. Since relative price movements in the long-run have a profound effect on the relative shares of the various energy sources in total energy demand, the effect of scenario assumptions on the final outcome of the forecast will be important.

The state of technology in South Africa is closely related to that in other industrial countries. However, factors like the abundance of cheap coal and the absence of natural gas cause continuous adaptation to local circumstances. The presence of a third world component in South Africa also necessitates technological adaptation. Although the South African energy demand pattern will follow the pattern of the industrial world in general terms, the local technology-related circumstances will cause deviations.

The period of uninterrupted economic growth and development over more than a generation since 1945 has at least been interrupted seriously and may possibly have ended for the time being for South Africa. Drawing up scenarios for the future will necessarily have to take this into account. The problem is that it is difficult to adapt the way of thinking of those responsible for forecasting to the changed situation.

"AN ANALYSIS OF THE RELATIONSHIP BETWEEN GROSS DOMESTIC PRODUCT AND ENERGY DEMAND GROWTH PATTERNS IN FORECASTING ENERGY TRENDS IN THE REPUBLIC OF SOUTH AFRICA"

J. A. L. Vorster, Minergo, Pretoria, South Africa

Historic trends indicate that gross domestic product and energy demand growth ratios in the Republic of South Africa differ from those in developed countries elsewhere. This paper analyses characteristics underlying energy demand in various energy sectors with particular reference to the transition from primary to industrial economic development. Decision-making aspects are evaluated endeavouring to identify guidelines the for meaningful forecasting of energy demand for long term energy planning purposes.

FORECASTING FOR MARKETING DECISION MAKING

Chair: Jean-Marie Choffray, Essec, Avenue de la Grande Ecole, B.P. 105, 95021 Cergy Pontoise, France and Gary L. Lilien, Penn State University, 310-A, Business Administration Building, University Park, PA 16802, USA.

"AHP AS A METHODOLOGY FOR SELECTING OR INTEGRATING FORECASTING TECHNIQUES"
Robert Dyer and Ernest Foreman, The George Washington University School of Business Administration, Washington D.C. 20052, USA.

Most standard reference sources on forecasting discuss the need to fit the forecasting approach to the specific situation for which the predictions are desired. Situational elements include such factors as stage in the product life cycle, time horizon for the forecast, and degree of demand stability. Similarly, lists of criteria are often provided to enable the forecaster or user to determine which techniques are appropriate for a given forecasting application. The criteria include elements such as degree of accuracy required, resources required, such as time, cost and specialized expertise, ease of communicating the forecast results, etc.

"APPLICATIONS OF INNOVATION DIFFUSION MODELS IN MARKETING"
Shlomo Kalish, Tel-Aviv University, Ramat-Aviv, 69978, Tel-Aviv, Israel and Gary L. Lilien, Penn University, 310-A, Business Administration Building, University Park, PA 16802, USA.

In this paper we focus on the application of explicit, diffusion models to aid in new product planning and decision making. The models we focus on are those that aim to control the future sales trajectory, i.e., normative models. Such models should have a causal link between the control variable and sales, so that alternative advertising policies, pricing policies and the like may be evaluated. To be most useful, the variables these models include should match up well with the marketing and product planning decisions that the organization faces. Our view is that there is no best, single, applied diffusion model. The problem, the data available and the specific characteristics of the situation combine to suggest the most cost/effective approach. We will review a range of applications, and conclude with suggestions (or lessons) for those who wish to make use of these models.

"THE ADAPTOR MODEL : FORECASTING SHARE OF CHOICE FOR NEW CONSUMER DURABLES"
Dwight R. Merunka, ESC Toulouse, 32 Rue de la Dalbade, 31000 Toulouse, France.

Current models of market response are useful in the consumer goods or in the industrial goods areas. This paper presents a probabilistic model of choice specifically designed for durable goods. The model allows prediction of the share of choice for each brand on the market. It is useful to assess future success for a new brand or a new concept. It offers managerial support for product design and product modification decisions. The probabilistic formulation relaxes the debated assumption of Independence of

Irrelevant Alternatives. The predictive accuracy of the model is assessed via empirical studies on two product classes.

"INTERACTIVE FORECASTING OF NEW INDUSTRIAL PRODUCTS PERFORMANCE"

Jean-Marie Choffray, Essec, Avenue de la Grande Ecole, BP 105, 95021 Cergy-Pontoise, France

This paper presents a new interactive forecasting system to be used as a planning aid for new industrial product diffusion analysis. The model of market response incorporates both first purchases and replacement. Calibration is done judgmentally, directly on the screen of a micro-computer. The diagnostic covers areas such as product diffusion, evolution of costs and profitability. Use of the system is discussed with two real life applications.

FORECASTING FOR BUSINESS STRATEGY

Chair: Paddy Fitzgerald, Dean, Faculty of Managing S. Int., Watts Building, Lewes Road, Brighton, UK.

"INNOVATION IN THE COMPUTER INDUSTRY"

A. Debecker and T. Modis, Management Science, Digital Equipment Corporation, USA.

A learning-curve approach has been employed to study inventiveness in the computer industry. The appearance of new models (other than PCs) as well as the appearance of new computer manufacturers follows typical logistic S-curves over the last 26 years of computer history. Innovation seems to come in S-waves and even though many of today's major manufacturers are close to exhausting their maximum innovation potential in their present S-wave the overall computer market is rather "young". Remarkably invariant over the 26 years considered, is the fact that for every five new computer models appearing in the market there is one new computer company emerging also.

"STRATEGIC PLANNING WITH A SYSTEM DYNAMICS MODEL OF REGIONAL TOURISM SITE DEVELOPMENT"

Richard G. Fritz, Department of Economics, University of Central Florida, USA.

This research follows the dynamics of the commodity production cycle of a tourism site through the non-linear technique of system dynamics. System dynamic models use feedback relationships to interrelate observed data and descriptive information to understand the internal linkages among the competing forces of the system. The resulting simulation provides a long run forecast which can be used by policy makers in achieving a balanced strategic management plan. Actually several long run forecasts are achieved, each drawing on an alternative scenario depicting changes in market conditions.

The first section reviews the evolutionary nature of tourism development. The evolutionary view portrays the tourism industry as one that promises many private and public economic benefits quickly, thereby obscuring the fact that negative impacts usually emerge during the latter and more mature stages of a site's development. There are three important considerations which contribute to the dynamics of the site. These include changes in the preferences and needs of the visitors (demand conditions), the gradual deterioration and possible replacement of physical plant and facilities (supply conditions), and the change or disappearance of the original natural and cultural attractions which were responsible for the initial popularity of the area (interaction between supply and demand conditions). Over time the type and volume of tourists change, the host culture changes and the reaction of community residents vary in a predictable manner with stages of tourist attraction development.

The second section of the paper develops a general dynamic model which illustrates the feedbacks associated with the evolutionary stages described in section one. While the system dynamic model is designed to be generic in nature, it has been developed based on the general characteristics of the

theme park growth in Central Florida. The strategic management problem is focused on one of the mature theme parks in the region.

The last section of the research reviews the insights from the simulation results. The results are interpreted as strategy support, used to provide more effective assessment of strategic proposals. Such strategic support can provide sharper insights into the consequences of pursuing proposals formulated by management intuition.

"ALTERNATIVE DECISONS AND STRATEGIES"

Dr. Erzsébet Gidai, Budapest IX, Haman K.u.70.fszt.1., 1096 Hungary.

No abstract

SOCIETAL FORECASTING

Chair: Peter Atteslander, Professor, Universitat Augsburg, Memminger, Strasse 14, D-8900 Augsburg, Germany.

"THE IRRATIONALITY OF SOCIETAL FORECASTING"
Dr. Christian Lutz, Managing Director, Gottlieb Duttweiler Institute, Ruschlikon/Zurich, Switzerland.

This paper argues that forecasting and planning are fundamentally rooted in a past scientific model of world and man which has turned out to be irrational in that it doesn't correspond to the perceived reality any more and in that it produced societal structures which contradict even a genuine economic and technological rationality ("Zweckrationalitat").

It argues in favour of a higher degree rationality, consistent with today's perceptions of reality and leading towards a 'rational' understanding of economic and technological rationality, in a pluralistic communication society, based upon the model of complex dynamic systems.

Beyond a world corresponding to the ancient model there is no way to produce rational forecasts, and consequently the vision of a higher degree rationality in a communication society is no forecast either. Though, in such a society there would be a way to deal with the future according to its higher degree of rationality, namely a communication process about potential future developments which by itself would change the systems and hence shape the future.

The rationality in this way of dealing with the future lies in standards increasing the quality of communication, including the art of metacommunication. It is in this potential to transcend one-self that resists the essence of human rationality and hence the capacity to participate in shaping one's own future.

"PREDICTING THE FLOWS OF KNOWLEDGE THROUGH CITATION AND CO-CITATION TRENDS : THE CASE OF DIRECT COAL LIQUEFACTION AND COGNATE SCIENCES"
Barry Bozeman and Stuart Bretschneider, Syracuse University, B139 Link Hall, Syracuse, New York 13210, USA.

Forecasting the flows of knowledge between scientific fields is an issue of both intellectual and practical interest. Sociologists of science have developed a variety of techniques to document scientific trends, but have not applied such approaches as citation analysis to forecast knowledge. This study illustrates the uses of citation analysis for predicting knowledge flows among scientific specialties. The field examined here is direct coal liquefaction. This field is an ideal subject because the knowledge employed by persons seeking to advance the study of direct coal liquefaction comes from a great many scientific fields, some of which (e.g. genetic engineering) seem initially to have little direct relation. The practical

payoff from the technique employed here is that it can be used to formalize scientific communication structures and to inform policy decisions aimed at allocating research dollars in a manner that maximizes scientific productivity. Others have studied the "fertility" of scientific fields; we seek to determine the fertility of relationships among scientific fields.

"CHANGES IN FAMILY STRUCTURE - A LIFE STYLE APPRROACH"

Rainer Mackensen, Institute of Sociology, Technical University, Berlin, Germany.

Social forecasting, changes in attitudes and behaviour are subject to guess or model speculation. The scientist therefore looks for stable structures to guide him in future developments. A relatively stable structure is the demographic process; but component projections rest on individual haracteristics, while the demographic process is the result of family performance. The paper discusses tendencies in the structural development of families in modern societies, and isolates conditional factors for family change, which seem to have rather slow modes of development. The life style concept, combined with a family cycle approach, seems suitable to organize data on family types in order to maximize characteristics of stability in the material. Mutual checks of changes in family structure and distribution of types of families in the society demonstrate limits to the rates of change. It also suggests ex ante projections for better tests of possible changes in environmental conditions and external determinants. The paper is based on a long range study of consequences of demographic developments.

FORECASTING FOR INDUSTRIAL PRODUCTS

Chair: David Weinstein, INSEAD, Bld. de Constance, Fontainebleau 77305, France.

"FORECASTING IN THE CONTEXT OF THE SPECIALTY STEEL INDUSTRY"
Ulf Gyllenholm, Vice President, Marketing, Uddeholm Tooling AB, PO Box 324, 5-65105, Karlstad, Sweden.

The demand for an industrial product is derived from the demand for products and services at the end use level. This situation is acute in the tooling steel industry, which supplies tool makers who, in turn, design and build machine tools for their own clients. This presentation will use the example of forecasting demand and sales for tooling steel which is used eventually for the manufacture of automobiles. The special context of competition in the automobile industry and the variety of models which are frequently introduced will be considered.

"FORECASTING IN THE CONTEXT OF THE SPECIALTY CHEMICALS INDUSTRY"
Werner Salathe, Ciba-Geigy AG, CH-4002 Basle, Switzerland.

Specialty chemicals manufacturers usually offer a wide product line selling to a wide variety of production processes and applications. The forecasting in this context is done at many levels simultaneously, in order to reach some converging conclusions. This presentation will consider the dyestuff and chemicals used in textile, leather, paper and other products. Forecasting will be discussed at the macroeconomic, product-by-product, production demand of finished goods levels. The role of forecasting in a world of integrated materials management will then be discussed.

"RESOURCE ALLOCATION FORECASTING IN THE TELECOMMUNICATION AND INFORMATION INDUSTRY"
Jim Van Horn, ITT Europe, Avenue Louise 480, B-1050 Brussels, Belgium.

The general manager in the telecommunication industry needs to allocate his resources so that the right system gets at the right price to the market and into the right hands. The market is segmented into three areas based on need. Political, social, economic, fiscal, geographic and business aspects are discussed in terms of the forecasting of product/service needs. The multivariant problem is then reconstructed to take into account the variations in needs and social evolution. The summing of these conditions leads to a resource allocation forecast and a basic multinational worldwide business plan.

COMBINING FORECASTS

Chair: Roger Williams, St. John's University, College of Business Administration, Dept. of Economics and Finance, 6 Devon Drive, Orangeburg, N.Y. 10962, USA.

"THE COMPOSITES METHOD OF FORECASTING"
Dr. Roger Williams, 6 Devon Drive, Orangeburg, N.Y., 10962, USA

Composite indexes (similar to the Department of Commerce leading indicator) are valuable forecasting tools which should be used more widely. They are much simpler and more flexible than elaborate econometric models, and yet they include a number of smoothed explanatory variables.

Various carefully selected advance warning indicators are combined into a single index, with monthly changes being divided by historical average monthly changes to adjust for volatility. The resulting index can point to major changes of direction or magnitude.

We have applied the composite forecasting technique to the economy, the inflation rate, interest rates, and the stock market.

Necessary computer programs can be obtained from the Bureau of Economic Analysis, U.S. Department of Commerce, Washington, D.C. 20230.

"TOWARDS A JUDGMENTAL STRATEGY OF PLURAL ANALYSIS FOR FORECASTING"
Dr. Rex V. Brown, Decision Science Consortium Inc., 7700 Leesburg Pike, Suite 421, Falls Church, Virginia 22043, USA

A good deal of work has been done recently by Winkler, Makridakis, Bunn, and others on combining multiple forecasts, after they already exist. This paper proposes a strategy for proactively developing multiple forecasts and allocating efforts between them. Judgments on the credibility of the candidate approaches and their independence play a critical role.

"A BEHAVIORALLY BASED METHOD FOR FORECAST COMBINATION"
Kent D. Wall, U.S. Naval Postgraduate School, Monterey, CA 93943 and Charles Correia, U.S. Army Logistics Center, Fort Lee, VA 23801 USA

Determining the best combination of competing forecasts is a problem that has been approached primarily from a statistical viewpoint. The present paper presents an alternative solution which is based on two behavioral considerations. First, the major consumers of forecasts, decision makers and managers, exhibit a form of risk/regret whereby they assign different costs to different types of forecast error and prefer forecasts that are biased in favor of avoiding "high cost" errors. Second, the models from which forecasts are obtained are more often employed in a multi-step prediction mode even though their parameters have been chosen to minimize only one-step prediction error variance.

"FORECASTS COMBINATION AS A FORECASTING TECHNIQUE: SPECIAL PROBLEMS WITH QUARTERLY NATIONAL ACCOUNTS"

André Keller, University of Paris II and CNRS - France

The quarterly macroeconomic forecasts may be computed out of other forecasting results upon different related economic indicators. A reduced national accounts framework is taken, and Box-Jenkins methods are applied to get the forecasts about the indicators. Some econometric relations specify the dependence of the accountancy concepts on the indicators. Thereafter, a solution is found to two main difficult issues in this paper. Firstly, the different forecasts for each macroeconomic variable are combined. Secondly, we consider the interdependance between the concepts also constrained by usual accountancy relations and identities. It is only a non-linear programming problem.

TELECOMMUNICATIONS MODELING AND ANALYSIS : THEORY 1

Chair: A. de Fontenay, Bellcore, USA.

Discussant: N. Curien, DGT, France.

"THE DEMAND FOR EXTENDED AREA SERVICE (EAS): A QUALITATIVE CHOICE MODEL TO FORECAST EAS DEVELOPMENT AND ASSOCIATED USAGE STIMULATION"

Don Kridel, Southwestern Bell Telephone, USA.

Since the divestiture of the Bell Operating Companies by AT&T, considerable attention has been paid to the pricing of telecommunications services. The focal point of the dilemma is the erosion of the various subsidies, particularly from toll and interexchange access, that support low local service rates. It is feared by many that this erosion will have dire consequences for universal service. The erosion is being fostered by various competitive and regulatory actions - bypass, toll competition, toll pooling, asymetric regulatory policies, etc. Recently, another mechanism has appeared in Southwestern Bell Telephone (SWBT) territory: Extended Area Service (EAS). EAS allows a subscriber to increase calling scope and face much lower marginal toll rates, usually zero. EAS is not a new service but has been inactive until recently. In Missouri and Texas dockets are scheduled that will determine the future of EAS in these states. Similar action is expected in the other three SWBT states.

In addition to these issues of regulation and pricing there are also routine issues to be resolved. Offering EAS requires extensive network re-design. To optimally re-configure the network accurate forecasts of traffic volumes (e.g., stimulation) and type (e.g., toll traffic or EAS traffic) are required. The costs associated with the re-configuration as well as the predicted revenue deficiencies associated with EAS are then used to design rates for the offering.

A qualitative choice model is developed to explain the demand for EAS. Using survey and actual usage data from Rockwall, Texas, a logit model is estimated using Maximum Likelihood Estimation (MLE). From the estimated coefficients we employ sample enumeration to forecast development levels under alternative tariffs . These predictions are adjusted to reflect the differences in survey response vis-a-vis behavioral response. The individual choice probabilities are then used to predict the usage stimulation associated with the switch from toll service to EAS. Using the most-likely EAS rate, we calculate EAS development of over 75%, nearly 60% stimulation, and a per year decline in revenue of nearly 1 million dollars.

"A COMPREHENSIVE MODEL EVALUATING THE CONSEQUENCES OF ALTERNATIVE TELEPHONE PRICING POLICY"

Lewis J. Perl, National Economic Research Associates, Inc., 123 Main Street, White Plains, NY 10601, USA.

This paper describes a comprehensive model evaluating the consequences of alternative telephone pricing policy. The model contains demand equations for residential and business access demand, local usage demand and toll demands in various markets. Using these data and estimates of production costs for various components of telecommunications services, the model can evaluate the social welfare consequences of alternative telephone pricing

policies. Moreover, given any set of costs the model will estimate a set of prices which optimizes total consumer welfare. In addition to forecasting the total welfare effect of alternative pricing policies, the model describes the distribution of those effects by income class. In developing these estimates the model takes account of the well-known externality in telephone market and includes this externality in measuring welfare consequences. The model has been used to evaluate the social welfare gains from more efficient telephone pricing policies in the United States and has also been used to evaluate the welfare gains from instituting cost-based prices for local measured service.

"A SURVEY OF TELECOMMUNICATIONS : DEMAND MODELLING"
A. de Fontenay & R. White, Bellcore, USA.

No Abstract

FORECASTING AND PRODUCTIVITY

Chair: Victor Selman, Management Department, The American University, Washington DC, 4400 Massachusetts Avenue, Washington, DC 20016, USA

"A HOLISTIC APPROACH TO RELIABILITY FORECASTING AND PRODUCTIVITY"

Victor Selman and Charles I. Bartfeld, The Kogod College of Business Administration, The American University, Washington, D.C. 20016

One of the most important functions of a reliability analyst is the timely forecast and recommendations to management of the projected performance of a system, subsystem, assembly and components. In most cases, the reliability analyst makes the prediction by a) aiding in the development of the system b) developing a reliability functional flow model containing "black box" series and parallel functionalities c) apportioning the system specification to each of the black boxes in the system and subsystems d) synthesis of state-of-the-art failure and repair rates for each of the black boxes using a combination of field data for similar equipments and governmental agencies' publications such as MIL-HDBK217D and IDEP failure rates e) trade-off analyses between the apportionments and synthesis f) mathematical calculation of reliability, availability, and maintainability for system and subsystems. Unfortunately this approach is not always effective for a final performance forecast. Since reliability is defined as "the probability that a system will operate satisfactorily when used in the specified environment", many factors come into play besides the electronic and mechanical characteristics of the components. These may include operator quality control attitudes, management risk tendencies and aversions, management information system controls and feedback among many factors. This paper develops an overall reliability model with a holistic productivity approach to provide more accuracy in reliability predictions.

"FORECASTING EMPLOYMENT IN SERVICES AT THE STATE LEVEL"

Rajindar K. Koshal, Manjulika Koshal and Kahandas Nandola, Ohio University, Athens, OH 45701, USA

Over the last two decades employment in services has gained importance even in the states where manufacturing employment used to be on the fore-front. The purpose of this paper is two fold. First, to examine the relationship of the service sector in Ohio with the service sector in the United States. This examination would reveal the changing structure of this sector in relation to technological advances after the energy crisis of the seventies. Second, this paper develops forecasting models using both econometric as well as time series techniques. The results of these two techniques are compared to provide a reliable method for predicting the future activities in the services sector.

"MODELE PREVISIONNEL DE L'EMPLOI DES CADRES DANS LE B.T.P."

Bernard Pigagniol, I.C., 11 rue Christophe Colomb, 75008, Paris

Le modèle mis au point par l'INSTITUT DE PREVISION ET DE CONJONCTURE PLUS-CONSULTANTS détermine les perspectives en matière d'emploi des cadres dans le B.T.P., en fonction des perspectives d'évolution des différentes activités dans ce secteur.

Les perspectives en matière d'emploi sont détaillées selon les principales activités du secteur (Travaux Publics, gros oeuvre....) et les principales fonctions occupées par les cadres.

Les répercussions sur le marché du travail sont également analysées dans ce modèle, notamment au niveau des offres d'emploi paraissant par voie de presse ou traitées directement par l'A.P.E.C.

"LABOR MARKET FORECASTING: THE USE OF THE LIFE CYCLE THEORY IN PREDICTING LONG-TERM CHANGES IN LABOR SUPPLY"

John D. Owen, Economics Department, Wayne State University, Detroit, Michigan 48202, USA

A long-term analysis of data on the life cycle of labor supply of successive cohorts of Americans in the 1920-1980 period confounds conventional wisdom. Many economists now expound a life cycle theory of labor supply which argues that rational individuals will plan their lives so as to work more hours in those years when their wages are highest: in that way, they obtain the most consumer goods at the least sacrifice in leisure.

One reason for the popularity of this theory is that it has been tested, in earlier investigations, by looking at single year age cross-sections, such as the breakdown of the population by age in a given U.S. Census year. Such data do indicate that labor supply is generally higher at those ages when hourly wages are higher. But this 'snapshot' offers a false picture of the actual aging experience. The different age groups shown in the Census were born in different years, and had different life experiences as a result. More specifically, the Census data cross-section does not capture the effects of the downward time trend in labor supply and the upward trend in wages.

When the actual life cycle experience of cohorts is examined one does not find this strong positive relationship between wages and labor supply. In fact, a weakly negative relationship is observed.

Individuals do not act according to the life cycle theory's prediction of rational planning. Individuals can not predict their future wages and employment prospects partly because these depend upon historic events that will impact on national productivity and employment levels. Moreover, even if an individual could forecast successfully, he would have great difficulty in acting on his predictions, because of social and economic constraints.

The historical data examined here also bring out the importance of government and other social influences on labor supply. This is seen even when it is assumed that labor supply decisions are made by rational individuals who pursue their own happiness or utility. Broad social changes occur: rising labor productivity, resulting in much higher wages; much more support from government for study or for retirement; a variety of technical advances that lighten the burden of housework. These changes are generally not anticipated, so that the individual, however rational, must continually adjust his plans, and act accordingly.

Under such circumstances, the usefulness of the life cycle theory in forecasting long-term changes in labor supply is circumscribed.

EVALUATION DU RISQUE POLITIQUE : APPLICATION

Chair: S. de Klebnikoff, Thomson-CSF, Vice President de l'Association Francaise des Analystes de Risques-Pays (AFAR), France.

"LES NPI D'ASIE VERS UNE CRISE DE STRUCTURES PREVISIBLE"
Jacques Gravereau, Consultant Professeur A HEC, France.

Les "quatre petits dragons" d'Asie (Coree du Sud, Hong Kong, Singapour, Taiwan) représentent un type de développement de moins en moins homogène et vont affronter une crise de structures industrielles et commerciales pleine de risques. L'analyse evalue les ruptures dans leur structure intrinsèque et leur environnement international et indique le risque politique et économique qui s'attache à moyen terme à ces quatre entités.

"LES LIGNES DE FORCES DU CONFLIT IRAK/IRAN"
Marc Cadel, Chercheur, France.

Depuis 6 ans l'IRAK et l'IRAN s'affrontent dans une guerre meurtrière qui se déroule sous l'oeil attentif des pays environnants et des super-grands.

L'évaluation proposée tend à souligner les paramètres qui déterminent la conduite de la guerre, les limites du soutien extérieur aux deux belligerants, la prudence des grandes puissances.

"CHOIX POLITIQUES ET ECONOMIQUES DE L'AMERIQUE LATINE"
Armen Kouyoumdjian, Assistant Managing Director INTERMEX, Chairman of APRA/EUROPE.

Dans les années à venir, les principales économies de l'Amerique Latine doivent faire un choix decisif entre l'effort parfois surhumain de continuer un service de cette extérieure rubis sur l'ongle ou de faire repartir un développement qui s'impose après plusieurs années d'austérité, durant lesquelles le sous developpement ne s'est pas amélioré, bien au contraire.

L'intervention aura pour objet de voir quel choix sera fait et quelles en seront les conséquences pour la région et le reste du monde.

FORECASTING INFLATION AND RECESSIONS

Chair: Geoffrey Moore, Director, Graduate School of Business, Columbia University in the City of New York, 323 Uris Hall, N.Y. 10027, USA

"TWO METHODS OF IDENTIFYING RECESSIONS"

Geoffrey Moore, Director, Graduate School of Business, Columbia University in the City of New York, 323 Uris Hall, N.Y. 10027, USA and Victor Zarnowitz, University of Chicago, Ill 60637, USA

In the recently enacted Gramm-Rudman-Hollings bill to reduce the Federal deficit a procedure to identify recessions was adopted in order to avoid expenditure cuts when a recession is indicated. The procedure becomes effective when the designated government agencies forecast a decline in real GNP for two consecutive quarters. This definition of recession, proposed by Arthur Okun in the 1960's, has fit most recessions otherwise identified. We propose to examine several quarterly forecasting records to see how well economists would have done if this criterion for recession had been used in the past.

An alternative method of identifying recessions, namely the occurrence of an increase of a half-percentage point or more in the unemployment rate, has recently been proposed by Moore. Here again we plan to examine records of economists' forecasts of unemployment to determine their success rate if this criterion were used. Considerations such as timeliness, false signals, skipped cycles, etc. will be examined.

Finally, we will compare the relative merits of the two methods of identifying recessions and their consistency with one another.

"LONG-TERM REAL INTEREST RATE FORECASTING AND THE ROLE OF UNCERTAINTY AND DEFICITS"

Demetrios S. Giannaros, Department of Economics, University of Hartford, West Hartford, Connecticut 06117, USA

This paper proposes that the long-term real interest rate is not constant and that a number of variables (including expected inflation, inflation uncertainty and budget deficits) are the principal causes of its variation. The post-1979 possible structural change and the impact of budget deficits on the long-term real interest rate behavior is tested empirically. A reduced-form equation is derived and modified for the structural stability analysis. The best performing models, once the stability of the equations is established and forecasting validations are carried out, are used to forecast the long-term real interest rates for 1985 and 1986. The results indicate a neutral direct effect of budget deficits on the real rates that structural break did occur around 1980, and that the 1985 and 1986 rates are forecasted to be lower than those of 1984.

"SIGNALS OF CYCLICAL MOVEMENTS IN INFLATION AND INTEREST RATES"

Dr. John P. Cullity, Department of Economics, Rutgers - the State University, Newark, New Jersey 07102, USA

This paper will explore the use of a leading index of inflation to generate signals of cyclical upturns and downturns in the rate of inflation and in short and long term interest rates. Signals will be defined in terms of the

smoothed growth rate in the leading index. The dates when these signals occur during the period 1948-85 will be compared with the dates of highs and lows in the inflation rate and in interest rates in order to measure leads and lags. Movements of the variables between signal dates will be measured in order to determine how much of their total variation is accounted for by the signals. All of these results will be used to develop an appraisal of the value of the signals as a guide to the implementation of economic policy and investment decisions.

PREVISION ET EVALUATION TECHNOLOGIQUE
TECHNOLOGICAL FORECASTING

Chair: R. Barre, CNAM, Departement Economie et Gestion, 2 rue Conte, Paris 77003, France.

"UN INSTRUMENT D'ACTION STRATEGIQUE POUR LA POLITIQUE DE LA SCIENCE ET DE LA TECHNOLOGIE: LES 'PROGRAMMES DIFFUSANTS'

Remi Barre, CNAM, Departement Economie et Gestion, 2 rue Conte, Paris 77003, France.

Malgre un taux d'effort national pour la Recherche-Developpement (RD) qui la situe dans les 5 premiers pays au monde, le "systeme Science-Technologie-Economie" (systeme STE) de la France a des caracteristiques tres marquees qui la differentient des autres pays: volume relatif important de la recherche publique, grands "programmes de developpement technologique" (espace, aeronautique, nucleaire, telecommunications), faiblesse de la RD industrielle, aussi bien en financement qu'en execution, manque de competitivite des industries de pointe malgre leurs capacites techniques, lenteur de la diffusion des hautes technologies dans le tissus industriel, difficultes d'adaptation du systeme d'enseignement superieur ...

La politique publique de la ST definie et mise en oeuvre depuis 4 ans par l'intermediaire de 2 lois de programmation successives couvrant la periode 1982-1988, vise notamment au decloisonnement de la recherche publique a la mise en place au niveau regional d'instruments de diffusion technologique, d'incitations "neutres" a la recherche industrielle et de concentration des efforts de R.D.

Pour concentrer les efforts de R.D. a ete defini et utilise un nouvel instrument de politique de la ST: les "programmes diffusants", apeless aussi "mobilisateurs" ou "nationaux"; ils sont definis sur de grandes technologies de base (electronique, materiaux, biotechnologies...), des secteurs economiques (transports terrestres, agro-alimentaire, BTP...) et de grands probelmes socio-economiques (relations technologie-emploi-travail, cooperation avec les PVD...)

Les programmes diffusants consistent en un processus qui se deroule selon 4 etapes successives, bien differentiees: definition des enjeux, bilan et identification des objectifs a 5 ou 6 ans (phase strategique), definition des objectifs operationnels, des actions et des partenaires (phase de preparation), execution des actions prevues avec suivi et reajustements pertinents (phase operationnelle) et enfin diffusion des acquis a travers la constitution de reseaux entre les acteurs concernes.

"METHODOLOGIE D'ANALYSE DE MARCHE DANS UN SECTEUR INDUSTRIEL NAISSANT. LE CAS DES APPLICATIONS COMMERCIALES DE L'ESPACE"

Marc Giget, Directeur d'Euroconsult, 71 Bld. Richard Lenoir, 75011 Paris, France.

La prevision de marche pour une activite industrielle en emergence est un exercice particulierement difficile. Meme l'erreur classique en matiere de prevision qui consiste a projeter les tendances du passe ne peut pas etre commise faute de tendances passees.

Une analyse est faite des methodes utilisees pour les principales previsions qui se sont succede au cours des 15 dernieres annees concernant les differents domaines d'applications spatiales. Celles-ci portent sur le marche des telecommunications, de l'observation de la Terre, des applications de la microgravite et des besoins de lancement correspondants.

Les methodes implicitement ou explicitement utilisees sont analysees de facon critique et comparative. Differents elements methodologiques sont proposes pour eviter les causes d'erreurs le plus souvent observees.

"METHODOLOGY OF MARKET ANALYSIS IN A NEW INDUSTRIAL SECTOR. CASE OF COMMERCIAL APPLICATIONS OF SPACE.

Marc Giget, Director of Euroconsult, 71 Bld. Richard Lenoir, 75011 Paris, France.

Market forecasting for an emerging industrial sector is particularly difficult. Even the common mistake in forecasting which consists in projecting the past trends cannot be made because there are no past trends.

An analysis will be made about the methods utilized for the main forecasts which followed one another the last 15 years concerning the different fields of space applications. These relate to the market of space telecommunications, remote sensing, microgravity applications and corresponding needs of launch systems.

The implicitly and explicitly utilized methods are analysed according to a comparative and critical form. Different methodological elements are proposed to avoid the most often observed causes of error.

"LA DIFFUSION DES NOUVELLES TECHNOLOGIES DE COMMUNICATION ET D'INFORMATION EN FRANCE"

Claire Ancelin, Ministere des PTT, 20 Avenue de Segur, 75700 Paris, France.

Le processus de diffusion des nouvelles technologies de communication et d'information (par exemple, le videotex) est complexe a apprehender. Pourquoi une technique "prend" - elle dans une societe alors que d'autres restent au purgatoire de longues annees ou sont meme releguees dans les cimetieres technologiques?

Sans pouvoir bien sur traiter ce vaste sujet, cette communication abordera deux points:

1) Le role de l'experimentation sociale. Les annees 1978-1982 ont vu naitre en France de nombreuses experiences, notamment en matiere de videotex. Comment ont-elles evolue ? Quel role ont-elles joue dans la diffusion de la technique concernee? Quelles ont ete leurs limites? Quelles lecons en a-t-on tire ?

2) Le role des "facteurs humaines". Face a un probleme de diffusion, les questions simples telles que "l'offre technique est-elle de qualite?" et "une demande existe-t-elle?" sont de peu de secours; l'observation de situations concretes montre que la realite est plus complexe et que, par exemple, la technique la plus sophistiquee n'est pas toujours la plus pertinente, ou que des usages apparaissent, la ou ne semblaient pas exister

de besoins. Nous discuterons ici de quelques aspects de la face cachee de la diffusion : detournements d'usages par les utilisateurs, role de l'animation sur certains services, role de certains intermediaires ou mediateurs entre la technique et l'usager pour diffuser un savoir faire et sensibiliser des usages potentiels.

"THE DIFFUSION OF NEW TECHNOLOGIES OF COMMUNICATION AND INFORMATION"

Claire Ancelin, Ministere des PTT, 20 Avenue de Segur, 75700 Paris, France.

The diffusion process of new technologies of communication and information (for example videotex) is complex and difficult to understand. Why does one technology "take hold" in a society while others remain in limbo for many years or are relegated to the technology junkpile?

Being unable to address the entirety of this vast subject, this presentation focuses two factors which influence the diffusion process:

1) The role of social experiments: during the years 1978-1982, one observed the birth of numerous experiements notably in the area of videotex. How did these experiments evolve? How did they contribute to the diffusion of new technologies? In what way were the experiments limited in their applicability to later, larger scale initiatives? In short what lessons can be drawn from such experiments?

2) The role of human factors : in the face of a diffusion task, simple questions like "Is the technology of high quality?" and "Does a demand exist for it?" aren't very useful.

Observation of actual cases reveals that the diffusion process is extremely complex and that, for example, the most sophisticated technology isn't always the best one for meeting an existing need or that uses appear without obvious need. We will discuss several aspects of the hidden face of diffusion : unexpected uses of the technology, the role of individuals and organizations in providing knowledge and stimulating interest in certain applications.

"PREVISION DU NIVEAU D'EMPLOI : UNE LECON DE L'INDUSTRIE D'ASSURANCE EN SUEDE"

Bengt Stymne, Ecole Superieur des Sciences Economiques de Stockholm et Ecole Centrale de Paris, France.

En essayant de determiner la relation d'investissement d'equipement electronique avec le niveau d'emploi dans l'industrie d'assurance en Suede, j'ai trouve un exemple interessant de prevision et de planification du personnel dans une grande entreprise. On avait engage tous les chefs d'entreprise pour estimer les possibilites de reduite la main d'oeuvre quand un systeme d'ecrans et de nouvaux ordinateurs puissants avait ete installe. Le chiffre des effectifs auquel les dirigeants d'entreprise arriverent apres cette etude, et qu'ils trouverent probable, se trouva, apres quelques annees, depasse de 100 pour cent.

Pour mieux comprendre comment ce resultat s'est produit, nous proposerons un modele fonde sur la theorie d'organisation. Celui-ci implique que des perturbations exterieures creent des interferences qui donnent des effets

surprenants. Il peut aussi nous eclairer pour comprendre le developpement du niveau d'emploi dans tout le secteur de l'assurance en Suede; tel que montrent les chiffres.

"FORECASTING THE EMPLOYMENT LEVEL. A LESSON FROM THE SWEDISH INSURANCE INDUSTRY AND ANOTHER TRY"

Bengt Stymne, Ecole Centrale de Paris, Grande Voie des Vignes, 92295 Chatenay, Malabry, France.

In an attempt to determine the relation between investments in computer technology and employment level in the Swedish insurance industry, I came across an interesting example of forecasting and personnel planning in a large company. The company had involved all of its managers in a serious exercise of estimating the number of employees needed in each department after the introduction of VDUs at the work-places connected to powerful computers. A small decrease in the number of employees was forecasted if no special measure was taken. However, a substantial decrease was deemed possible if the situation was handled correctly. After five years the number of employees had in reality grown and the forecast had been surpassed by 100 per cent. To explain the dynamics behind this outcome a model is suggested which uses organizational factors as variables intervening between investments in technology and productivity. This model was eventually applied on the industry level.

STATISTICAL MODEL BUILDING AND PREDICTION

Chair: J. Droesbeke, Université Libre de Bruxelles, Avenue F. D Roosevelt 50, 1050 Brussels, Belgium.

"EXPONENTIAL SMOOTHING : ESTIMATION OF PSEUDO-MAXIMUM LIKELIHOOD"

L. Broze and G. Mélard, Université Libre de Bruxelles, Avenue F. D Roosevelt 50, 1050 Brussels, Belgium.

In this paper several forecasting methods based on exponential smoothing with an underlying ARIMA model are considered. The relations between the smoothing constants and the coefficients of the autoregressive and moving average polynomials are given. This paper contains a pseudo-maximum likelihood procedure to estimate smoothing constants. Such an approach eliminates the need for initial values. Other advantages of considering the underlying ARIMA models are briefly discussed : inclusion of intervention analysis, derivation of the probability distribution of future values. Fast algorithms for implementing the method are indicated.

"PUBLIC FINANCE FORECASTS IN A SHIFTING INTERNATIONAL ENVIRONMENT : A CASE STUDY OF THE BELGIAN ECONOMY"

M. Adam, M. Dewatripont and F. Thys-Clément, Université Libre de Bruxelles, Belgium.

The international environment has undergone dramatic changes since the early 80's : dollar and oil price movements, disinflation and interest rate volatility. In a small open economy, these modifications entail non-negligible effects on budget deficits and the structure of public debt.

The aim of this study is to evaluate these effects in the Belgian context, which provides a typical case of a small open economy where fiscal disequilibria represent a major macroeconomic constraint. To this end, we use a macroeconometric model which allows for the explicit interaction of real and monetary variables. In order to provide consistent forecasts of fiscal aggregates, we distinguish between (a) direct effects resulting from the exogenous perturbations in international variables and (b) induced effects caused by domestic policy reactions to the shifting international environment.

"FORECASTING AND INTERVENTION ANALYSIS IN SPACE-TIME PROCESSES"

Stuart Jay Deutsch, Professor, School of Industrial and Systems Engineering, Georgia Institute of Technology, Atlanta, GA 30332, USA.

The Space-Time Autoregressive Moving Average (STARMA) model class for description of a random variable measured at 1 locations each point in time over time is overviewed. Their direct use in forecasting and their extension to intervention analysis is described. The relationships between forecasting and intervention analysis are discussed. The consequences on the accuracy and precision of forecasts of univariate ARMA models applied to multiregion systems, on a region by region basis is quantified.

RENTABILITE ET RISQUE SUR LE MARCHE IMMOBILIER

Président : Michel Albouy, Professeur à l'Université de Grenoble II.

"LE FINANCEMENT DES ACQUISITIONS DE LOGEMENTS NEUFS ET ANCIENS : LE ROLE DES VARIABLES DE RENTABILITE ET DES RISQUES SANS LE CHOIX DES MENAGES"
Philippe Raimbourg,
Maître Assitant à l'Université de Paris IX Dauphine.

A partir d'une étude économétrique, l'auteur teste un modèle de comportement des ménages fondé sur une logique de choix de portefeuille. Le modèle et son test mettent en lumière les nationalités différentes des ménages en matière de financement de logements neufs et anciens.

"LES LIMITES DE L'ENDETTEMENT POUR LE FINANCEMENT DU LOGEMENT"
Christian Hureaux, Professeur à l'Ecole Supérieure de Commerce de Poitiers.

L'objet de la communication est de montrer comment le prêt à partage de plus-values peut être un outil de financement de logement lorsque les limites d'endettement des ménages sont saturées.

"L'IMMOBILIER DE LOISIRS : LES CONDITIONS FINANCIERES DE SON DEVELOPPEMENT"
Patrick Gougeon, Professeur de Finance au Groupe Ecole Supérieure de Commerce de Paris.

Après une période d'euphorie, l'immobilier de loisir marque le pas. S'agit-il d'une rupture momentanée ou est-ce au contraire le signe d'une mutation ? Suite à un certain nombre d'analyses, il apparaît que les modalités traditionnelles de financement du secteur devront être révisées. Quels sont les éléments qui permettent d'aboutir à cette conclusion ? Quel est le sens de l'évolution ?

"LE COUPLE RENTABILITE-RISQUE DE LA PROMOTION IMMOBILIERE"
Michel Albouy, Professeur à l'Université de Grenoble II.

L'objet de cette communication est de montrer à partir d'un échantillon d'une centaine d'opérations de promotion immobilière la rentabilité moyenne de ces opérations et leur risque. Cette études confirme l'idée que la promotion immobilière est une activité relativement risquée et dont la prime de risque est en proportion avec le niveau de risque de ses opérations.

ANTICIPATIONS RATIONNELLES

Chair: Christian Gourieroux, Universite de Lille I et CEPREMAP, France.

"REDUCTION AND IDENTIFICATION OF SIMULTANEOUS EQUATIONS MODELS WITH RATIONAL EXPECTATIONS"

L. Broze and A. Szafarz, Université Libre de Bruxelles, Belgium, and C. Gourieroux, CEPREMAP, France.

In this paper we consider simultaneous equations models with rational expectations.

Before considering estimation or testing problems, it is necessary to solve the models in order to eliminate the unobservable expectations. This is a first step for determining the observable reduced form of a R.E. model.

Then, by comparing this reduced form to the initial structural model, it is possible to address the problem of identification.

These two aspects, reduction and identification, are examined for a class of R.E. models containing both current and future expectations.

"ON TESTING RATIONALITY OF DEMAND EXPECTATIONS FROM QUALITATIVE SURVEY RESPONSES"

Marc Ivaldi, GREMAQ, Universite des Sciences Sociales, Place Anatole-France, 31042 Toulouse, France.

In this paper we propose a test of the Rational Expectations hypothesis. With respect to other works on this topic, the paper presents different features. Indeed, we use qualitative panel data on demand expectations and realizations. We show how to use these informations to construct an expectational error variable. For the Rational Expectations hypothesis, the expectational error variable should be a white noise process.

As the data set is a panel, we can derive transition probabilities. This allows to test if these probabilities statistically represent a white noise process against the alternative of Markov processes of order at least greater than one. This likelihood ratio test is easy to compute.

Based on a classical 5% level of significance, our test rejects the null hypothesis. But we argue that this conclusion is not so clear if we adopt other criteria. The idea is that, as we are working with large data set, the classical level of significance is too conservative and we need a mean to adjust this level with respect to the sample size. This mean should be the power function; but the latter is difficult to derive for tests on non-parametric hypothesis.

"STRUCTURE PAR TERME DES TAUX D'INTERET : THEORIE ET ESTIMATIONS DANS LE CAS FRANCAIS"

Patrick Artus, Banque de France, France.

Dans ce papier, sont présentées tout d'abord les théories traditionnelles de la structure des taux d'intérêt : elles sont complétées par une interprétation des termes de prime de risque, à partir de l'explication du

comportement des détenteurs de portefeuille. La discussion porte sur le rôle de l'offre de titres, des fluctuations des taux, de leur lien avec le taux d'inflation, et sur la rationnalité des anticipations de taux futur et des moments du second ordre des distributions des taux futurs. Les estimations permettent de porter un jugement sur le mode de formation des anticipations, sur les informations utilisées pour calculer ces anticipations, sur la dynamique des taux longs et sur la plus ou moins grande rigidité de la courbe de structure des taux. Ces estimations portent sur le niveau des taux longs, ainsi que sur les écarts entre les taux correspondant à des échéances différentes.

STATE AND LOCAL GOVERNMENT REVENUE AND EXPENDITURE FORECASTING

Chair: Stuart Bretschneider, Assistant Professor of Public Administration, Syracuse University, 400 Maxwell Hall, Syracuse, New York 13210, USA and Wilpen Gorr, Professor of Public Affairs, Carnegie-Mellon University, Pittsburgh, Pennsylvania, USA.

"FORECASTING STATE AND LOCAL GOVERNMENT REVENUES"
Professor Stuart Bretschneider and Professor Wilpen Gorr.

This paper presents a general survey of current procedures, techniques, and organizational arrangements used by state governments to carry out the revenue forecasting function. Based on a survey done in 1985, the results indicate some commonality across the states. The data from the survey is also used to develop a model which identifies factors directly related to forecast performance. One major result indicates that states which have both legislative and executive branch agencies responsible for forecasting along with formal procedures for developing consensus forecasts, will tend to have more accurate revenue forecasts.

"FISCAL PROJECTIONS AND RAINY DAY FUNDS: RESULTS FOR THE STATE OF HAWAII"
Roy Bahl and Dana Weist, Metropolitan Studies Program, The Maxwell School, Syracuse University, USA.

The fiscal environment surrounding state governments has become increasingly volatile. It is imperative that states be able to forecast the potential fiscal impacts of swings in the business cycle, inflation, slow economic growth, or changes in Federal grant policy, as well as to anticipate the long-run impacts of their own discretionary policies such as increased borrowing or public employee settlements. Moreover, there is much current interest in estimating the needed size of "Rainy Day Funds". Most state and local government fiscal forecasting models have fallen short of meeting these needs because little attention has been paid to the expenditure side of the budget.

This paper develops a fiscal planning model which estimates a set of accounting identities on the expenditure side of the state budget and then projects these identities into future years on the basis of alternative assumptions. The projection of these expenditure requirements facilitates the assessment of revenue adequacy for the projection period.

"ACTUARIAL COST AND LIABILITY FORECASTING FOR PUBLIC PENSION PLANS"
Bernard Jump, Jr., Maxwell School, Syracuse University, USA.

This paper is concerned with the techniques used and problems involved in forecasting the accruing costs and liabilities associated with public pension plans.

A special characteristic of the defined pension benefit plans that are commonly offered to federal, state and local government employees is that employers may defer making any financial provision for an employee's accruing benefits until he or she retires. As long as the bulk of a jurisdiction's workforce is much younger than the minimum retirement age, a decision not to set aside the actuarial cost of accumulating pension

liabilities can seem to be the prudent course of action for a government that is suffering from fiscal stress. That is, the jurisdiction's immediate expenditures for employee pension benefits can be minimized.

But appearances can be deceiving, and failure to make provision for pension costs as they accrue is not prudent. It is not prudent because required annual appropriations to pay the benefits due to retired employees may eventually grow disproportionately large. It is also not prudent because pension benefits may appear to be cheap thereby encouraging excessively generous pension plans.

"RISK TAKING, POLITICAL ROLE, AND REVENUE FORECASTING INFORMATION: HOW THEY RELATE TO BUDGET SETTING IN LOCAL GOVERNMENTS"

Stuart Bretschneider, Assistant Professor, Jeffrey Straussman, Associate Professor, and Daniel Mullins, Doctoral Student, The Maxwell School, Syracuse University, Syracuse, New York 13244, USA.

Based on a small group experiment, this paper examines the relationships between individual propensity to take risk, cognitive style, historical performance (track record) at revenue forecasting, and political role of an actor in the budget process on budget setting behavior. Graduate students preparing for public sector careers and MBA students were presented a case dealing with a mid-sized local government's budget development based on forecasted revenues. Each student had to develop an initial control budget figure for the city. Treatment variables varied political role between legislative and executive staff functions in an environment of competing political interests, and the track record history for revenue forecast over the past five years; biased positive, biased negative and neutral historical forecast performance records were provided. Results indicate that cognitive factor had little influence on behavior, while accounting for propensity to take risk, political role's influence dominated the effect of the historic performance of revenue forecasting.

FORECASTING ELECTRICITY SUPPLY

Chair: B. Lescoeur, Electricité de France, France.

"FORECASTING FOR TARIFF SETTING IN THE SWEDISH STATE POWER BOARD"
J. Sundell, Vattenfall, Sweden.

The tariffs of the Swedish State Power Board are set according to the marginal costs, that is there is no direct connection between the income from the tariff and the total costs as they appear in the balance sheet. Hence the tariffs have to be adjusted in order to yield sufficient income to the company.

The load and sales forecasts are used to calculate the forecasted marginal production and distribution costs. These costs are - together with data on coincidence etc. the basis of the tariff. When the tariffs for different customers are constructed, they are indata for the income forecast calculation. In this system the sales forecast for different customer categories also is used, and the toal income for SSPB is calculated.

Income, costs of fuels, O & M costs, interests, taxes, depreciations, etc. are then used in the total economy forecast in order to evaluate if there is a need to increase or decrease the tariff.

"MARGINAL COST PRICING AND EXPECTED FINANCIAL REQUIREMENTS"
F. Careme, Electricité de France, 2 rue Louis Murat, 75384 Paris, France.

In the Boiteux tradition when the financial constraints of a public firms are binding, pricing policies obey no more the simple principle of equality between price and marginal cost. To preserve economic efficiency we have to take into account other elements such as elasticities. But this static second best analysis is not sufficient whenever the firm has to forecast its pricing for the next twenty years by making a relevant choice between internal financing and borrowing on the market with a smooth evolution of price, in the lack of capital endowments.

On e of the main difficulties which appears in a more dynamic analysis is the incertitude about the real interest rate. Because of the high level of the present EDF's debt, such a rate plays a crucial part in the financial run and therefore upon the departures between prices and marginal costs.

In this paper the interest rate is stochastic with a simple distribution and we examine its impact on expected prices and demand through a constant elasticity. The public firm minimises its discounted costs under the constraint of a production function with increasing returns to scale. We find that the firm has to integrate a risk premium in the long run prices announced today to customers.

Then we will describe the real long run situation of EDF illustrate the interest of our analysis

"FORECASTING THE EFFECTS OF A NEW RATE STRUCTURE WHEN EVIDENCE OF RESPONSE IS IN CONFLICT"

J. P. Acton and R. E. Park, The Rand Corporation, USA.

Utilities and their regulatory authorities must forecast levels of demand when considering new tariff levels or tariff structures (for example time of day rates for a group of customers not currently covered). Unless extensive within-=utility experience already exists, they generally rely upon empirical studies from other utility areas. At present, there is often conflicting evidence of response that wuold lead to radically different policy recommendations (apply new rate widely versus apply it narrowly). We examine empirically a detailed US data base of industrial customers on time of day electricity rates to determine when these differences are due to restrictive assumptions in the empirical models used (for example the translog model) and when they are due to the underlying variation among customers.

"LA PREVISION DES COUTS ECONOMIQUES DE FOURNITURES D'ELECTRICITE POUR DES FINS TARIFAIRES"

André Turgeon, Hydro Québec, Varennes, Canada.

Le but de la tarification au cout marginal est de transmettre au consommateur d'electricite le cout que le producteur devra encourir a la marge pour satisfaire son besoin.

Ce cout doit inclure l'utilisation de l'eau qui autrement aurait ete deversee ou vendue a l'exportation, ou utilisee plus tard, et, dans le cas ou la capacite n'est pas suffisante pour rencontrer la demande, le cout de defaillance.

Ce cout marginal a court terme doit de plus refleter le cout encouru par l'entreprise a long terme pour accroitre sa capacite de production et de livraison.

Cette presentation portera sur la facon d'evaluer et de prendre en compte des differents couts dans un reseau entierement hydroelectrique comme celui d'HYDRO QUEBEC.

"THE USE OF DATA IN SOCIETAL FORECASTING II

Chair: P. Atteslander, Universitat Augsburg, Memminger Str. 14, 8900 Augsburg, Germany.

"THE NEED OF AN EVALUATIVE RATIONALITY"

P. Atteslander, Universitat Augsburg, Memminger Str. 14, 8900 Augsburg, Germany.

Data in societal forecasting of middle-range development distinguish in most cases by overestimating numerical aspects and by comparison underestimate qualitative ones. Not those data which are important indicators of social change are taken into consideration but those data which can be collected relatively easy and without problems. Data collection normally have no relation to theories of social change.

Even when data come in planning and definition of societal goals they are utilized in an unsystematic manner: They are not collected for the purpose, they are used.

Data in societal forecasting have to be comprehended as a process of learning. Data collection has to be guided by theory and has to be adequate to the system. Complementary to the dominating instrumental rationality in societal forecasting an evaluative rationality has to be developed.

"FORECASTING ANOMIE : CRIME BY TYPE TO THE YEAR 2000"

D. Ahlburg, University of Minnesota, USA and M. Schapiro, Williams College, USA.

The effect of changes in relative cohort size on crime is examined. Three types of crime are considered - homicide, robbery and the sum of burglary and motor vehicle theft - with relative cohort size being an important factor in explaining post-war movements in all three cases. Even after crime rates are adjusted by the number of young males, cohort size continues to be an important causal variable. Unemployment, on the other hand, does not systematically affect homicide, although it does affect the other types of crime. Forecasts of the number of crimes and of adjusted crime rates show a large decline during the remainder of the century as the baby boon cohort ages and the relative economic situation of young males improves.

JUDGMENTAL ASPECTS OF SALES FORECASTING

Chair: Reza Moinpour, Professor, University of Washington, Graduate School of Business Administration, Seattle, Wa. 98195, USA and Doug MacLachlan, Professor and Chairman, School of Business Administration, University of Washington, Seattle, Wa. 98195, USA.

"SOME EXPERIMENTS ON JUDGMENTAL BIASES IN SALES FORECASTING : POINT-RANGE CORRELATIONS"

Douglas L. MacLachlan, Professor and Chairman, School of Business Administration, University of Washington, Seattle, Wa. 98195, USA; Spyros Makridakis, INSEAD, Bld. de Constance, Fontainebleau 77305, France and Reza Moinpour, Professor, University of Washington, Graduate School of Business Administration, Seattle, Wa. 89195, USA.

Results of two experiments are presented which illustrate judgmental biases of relevance to sales forecasting. The first experiment shows how the presence of a formal analytical model influences both point and range estimates in a new product forecasting situation. The second experiment demonstrates how level of involvement with the forecasting situation and background information regarding the maturity of the product class affect forecasts. An unanticipated result of these experiments was a clear positive correlation between point forecast estimates and "confidence interval ranges". Hypotheses for such correlations are presented and experiments proposed for testing them.

"ARE NEW PRODUCT PLANNERS POLLYANNAS?"

Tyzoon T. Tyebjee, Associate Professor of Marketing and Meir Statman, Associate Professor of Marketing, Leavey School of Business Administration, University of Santa Clara, USA

A substantial number, 30% to 40%, of new products do not live up to the expectations under which they are launched. The traditional approach in the marketing literature has been to develop an inventory of causes of new product failure, typically faulting the marketing strategy, its execution or some unanticipated development in the market. In this paper, we offer a different perspective on why so may new products do not live up to management's expectations. Three types of biases in the way these expectations are formed and performance evaluated against them are discussed. The post-selection audit bias is a result of measuring actual vs expected performance only for products which are in fact launched. Products for which the forecasts of market potential err on the conservative side tend to be aborted as poor prospects. Hence, in the pool of new product launches available for review, there is a disproportionate number of products for which the forecast had erred on the high side. Second, new product champions inflate the expectations of performance in their pursuit of support within their organizations, particularly as they expect that senior management will discount their claims to some extent when allocating resources. This we have called the gaming bias. Third, we entertain the possibility of planners falling prey to an optimism bias whereby they delude themselves about the likelihood of favorable market conditions, even in the case of factors outside their control. A series of experiments are reported in support of the optimism bias. The paper concludes with a discussion of managerial implications for new product planning and forecasting.

"FORECASTING CONSUMER SENTIMENT"

Bruce Headey and Alexander Wearing, University of Melbourne, Dept. of Psychology, Parkville, Victoria 3052, Australia.

Over the last two decades indices of consumer sentiment have gradually won acceptance as predictors of future consumption behavior, and they have been incorporated in a number of economic forecasting models. To this point very little attention has been paid to those variables (demographic, psychological and behavioral) which might determine and predict consumer sentiment itself. A survey of a stratified random sample of 393 adults from the Melbourne metropolitan area (population about two and a half million) was carried out. Information was gathered on the following categories of variables in addition to consumer sentiment: demographic status, attitudes toward economic policy, personality, motivation social and economic attitude, economic experience and economic behavior. Multivariate methods, including structural equation modelling was used to delineate and explicate the predictive relationships between these variables and consumer sentiment.

Chair: Ken Holden, The University of Liverpool, Eleanor Rathbone Building, Myrtle Street, PO Box 147, Liverpool L69 3BX, U.K.

"ANALYSIS OF MODEL-BASED FORECAST ERRORS"

Kenneth F. Wallis and John D. Whitley, ESRC Macroeconomic Modelling Bureau, University of Warwick, Coventry CV4 7AL, U.K.

This paper considers the errors in four forecasts of the UK economy made in late 1983. The forecasts are those of four groups whose models and databases are deposited at the ESRC Macroeconomic Modelling Bureau, namely the London Business School, the National Institute of Economic and Social Research, the City University Business School and the Liverpool University Research Group in Macroeconomics. In each case the impact on the forecast errors of different assumptions about external developments, the forecasters' residual adjustments, model differences, and data revisions is assessed.

"A COMPARISON OF ECONOMETRIC AND UNIVARIATE FORECASTING USING DATA OF THE DUTCH ECONOMY"

Willem Voorhoeve, Econometrics Institute, University of Groningen, PO Box 800, 9700 AV Groningen, Netherlands.

On the basis of annual data forecasts will be calculated for some important variables of the Dutch economy, using the econometric model GRECON and using univariate methods. The outcomes of both methods will be compared using the inequality coefficient of Theil for the ex post forecasts of the periods 1971-1980 and 1974-1980 as well as for the ex ante forecasts of the period 1977-1980.

The results will in general turn out to be better for the econometric model GRECON.

"FORECASTING WITH ECONOMETRIC AND TIME SERIES MODELS: AN EXAMINATION AND EVALUATION"

Jon A. Brandt, Department of Agricultural Economics, Purdue University, West Lafayette, Indiana and Robert Young, Department of Agricultural Economics, University of Missouri, Columbia, Missouri, USA.

Agricultural commodity forecasting has generally been accomplished with econometric models. Efforts have ranged from single equation designs to model building efforts of several hundred equations. More recently, time series analysis has been used to develop forecasts in agriculture. These too can be as simple as univariate ARIMA processes or as complicated as multivariate approaches. This paper will examine the model building efforts required to forecast several important price and quantity variables in the U.S. pork industry. Single and multiple equation econometric and univariate and multivariate time series models will be fit. Post-sample forecast evaluation will highlight the analysis.

"AN EMPIRICAL INVESTIGATION OF COMBINATIONS OF ECONOMIC FORECASTS"

Ken Holden, The University of Liverpool, Eleanor Rathbone Building, Myrtle Street, PO Box 147, Liverpool, L69 3BX, UK and D.A. Peel, University College of Wales, Aberystwyth, UK.

Granger and Ramanathan (J. of Forecasting 1984) and others have shown that if several forecasts of the same variable are available some combination of these forecasts will be superior to any of the individual forecasts. Different ways of combining both econometric forecasts and time-series forecasts of the UK economy are examined. The preliminary evidence suggests that while the 'optimal' weighting reduces the root mean square error within the estimation period, if this weighting is used for ex ante forecasting, poor forecasts result.

TELECOMMUNICATIONS MODELING AND ANALYSIS : THEORY II

Chair: M. Volle, CNET, France.

Discussant: M. Wylleman, Core, Belgium

"DYNAMIC FACTOR DEMANDS AND ADJUSTMENT COSTS : AN ANALYSIS OF BELL CANADA'S TECHNOLOGY"

Jeffrey I. Bernstein, Department of Economics, Carleton University, Ottawa, Ontario, Canada and National Bureau of Economic Research, Cambridge, Massachusetts, USA.

A common assumption running through econometric investigations of the technology and production structure of telecommunications carriers is that inputs are costlessly adjusted. This implies that carriers can instantaneously modify relative factor proportions in order to minimize production costs. It is doubtful that telecommunications carriers, which operate in a highly capital intensive industry with rapid technological change, can costlessly maintain a long-run cost minimizing standard.

The purpose of this paper is to develop and estimate a model which explicitly allows for the existence of adjustment costs. This permits the characterization and testing of the extent to which departures from long-run cost minimization are observed. In addition, short-run disequilibrium arising from adjustment costs affects the degree of factor substitution, economies of scale and scope. These measures are developed within the context of a dynamic adjustment cost model of production. Application of the model will be conducted on Bell Canada.

"ALLOCATIVE INEFFICIENCY & TOTAL FACTOR PRODUCTIVITY"

Francis S. McGowan, Alberta Government Telephones, Canada

This paper considers a model of the firm that allows systematic allocative inefficiency. The impact of deviation from optimal input proportions on Total Factor Productivity is analyzed. It is shown that productivity decomposition formulas can be extended to include terms expressing the effect of this deviation.

Empirical data for Alberta Government Telephones is used to illustrate the calculations of the optimal expansion path and the productivity decomposition. Because of data limitations, a simple Cobb-Douglas specification of the production function is used as the basis of this analysis.

The productivity decomposition for AGT resembles previous ones appearing in the literature, in so far as economies of scale are concerned. The optimal expansion path and the deviation effect are found to be sensitive to the method used to calculate the price of capital.

Two methods of capital pricing are used; the residual rate of return method and the user cost of capital method. It is found that the optimal expansion paths corresponding to these two methods lie on opposite sides of the actual expansion path. The residual rate of return method yields an optimal path that is more capital intensive than the actual path. The user cost of

capital method gives an optimal path that is less capital intensive than the actual path.

In order to better specify the optimal expansion path of the firm, a dynamic model is considered. Calculation of the optimal path is formulated as an optimal control problem. In the Cobb-Douglas case it is shown that the Euler equations can be solved in closed form. This is done for the case of AGT. The result is a path between the two static paths and very close to the actual path.

The dynamic model gives a better definition of the optimal expansion path. It also indicates the need to further develop the idea of Total Factor Productivity a dynamic in context.

This analysis of allocative efficiency can be applied to corporate planning models and to the forecasting of optimal input requirements.

"A SURVEY OF TELECOMMUNICATIONS ECONOMETRIC COST MODELS"
Frank Kiss, Bell Canada, Quebec, Canada.

No abstract.

"PREDICTION OF DEMAND ELASTICITIES WITH AN AGGREGATE CUSTOMER CHOICE MODEL"
D. Shinkawa, Bell Communications Research, USA.

This study begins by examining customer's choices between WATS and switched access for interLATA usage. For these two services, elasticities determined from historical data are available and can be compared to the model results. The derived elasticities agree with elasticities determined from historical data but they are sensitive to various assumptions in the model and the data. The results are also shown to be sensitive to stimulation or repression of usage and to other parameters, such as the distribution of usage among customers and the ability of WATS lines to carry usage offered to switched access lines.

The demand model can also predict elasticities of new services, as demonstrated by a study a tariff shopping in which customers can obtain access to a long distance network with special access lines (SALs) with tariffs which are not usage sensitive. Cross-elasticities for SALs are obtained even though historical data is not available. A similar and more immediate concern is AT&T's Megacom service, which is shown to have much of the same effect as tariff shopping for SALs, but quite different elasticities. These results indicate that the elasticities for switched and WATS service depend on what other alternatives exist to provide access services.

This report indicates that an aggregate customer choice model like the model used in these studies can be consistent with previous elasticity studies, and that reasonable estimates of elasticities for new services can be derived if sufficient data is available. It also indicates that models of customer-level decisions can be linked with econometric models.

CONTRIBUTED PAPERS IN TELECOMMUNICATIONS

Chair: J. Harvey, Overseas Telcom Commission, 32-36 Martin Place, Sydney, Australia.

"OVERSEAS TELECOMMUNICATIONS DEMAND MODELLING - THE SEARCH FOR THE OPTIMAL LEADING INDICATOR"

Dr. L.V. Defris, Planning Branch OTC Australia, Ms J. E. Murray, Planning Branch OTC Australia and Professor A. A. Weiss, Department of Economics, University of Southern California, USA.

The Australian international telephone service has exhibited fairly severe cycles over the time period 1973-85. Therefore, management requires early warning signals of imminent turning points in traffic demand and revenue.

To this end, this paper attempts to identify optimal leading indicators of international telephone demand. Specifically, it is hypothesised that the Leading Indicators of the Australian Economy, the Consumer Sentiment Index, the Business Sentiment Index, the US Coincident Index and the US Leading Indicator do lead outgoing telephoning.

Two principal techniques are employed: cross-spectral analysis and vector autoregressive modelling. The results from both indicate that the optimal leading indicator is the Business Sentiment Index.

"TELEMATICS AND ECONOMIC ASPECTS OF DIFFUSION"

Svein Bergum, Norwegian Telecom Administration Research Department, PO Box 83, N-2007 Kjeller, Norway.

Diffusion is the spread of new products or services through time. About 2700 references can be found, according to Rogers & Shoemaker (1971).

The intention of this paper is to discuss and evaluate the economic aspects of diffusion - especially the assumptions, structures, classifications and limitations of the diffusion models. Telematics as an economic - and diffusion object will be the focus, and the organization the main unit of analysis. At the end a proposal for a modified diffusion model will be introduced.

"A NEW ASPECT OF TELECOMMUNICATION DEMAND IN AN OUTSTANDING DEVELOPING COUNTRY"

Nien Keng Kao, Director of Corporate Planning Dept, Central Taiwan Telecommunication Administration, Directorate of General Telecommunications, Taiwan, Republic of China.

This paper discusses telecommunication development in a developing country. After reviewing the "Taiwan Experience", based on 4 surveys, the paper analyzes the consumer's psychology, in traditional telephone market, evaluates the current service performance and seeks the consumer's demand for the following services:

a) telephone market
b) evaluation of current service
c) public information processing system service
d) videotex

In summation, synthetic economic environment and survey results can be work out a telecommunication demand in future. That probably also is a typical model in telecommunication development of the third world countries.

"STRATEGIC AND REGULATORY ISSUES INVOLVED IN THE PRIVATIZATION OF TELEGLOBE CANADA"

Gordon E. Kaiser, Gowling & Henderson, Barristers & Solicitors, Suite 2400, 2 First Canadian Place, Toronto, M5X 1A4 Canada and Manley Irwin, University of New Hampshire, USA.

This paper discusses a strategic and regulatory issues involved in the privatization of Teleglobe Canada in light of the prospects of increased competition over the next five years. The analysis includes an estimate of the future rate structure to be faced on the international carriers in a competitive environment.

"FORECASTING TELEPHONE DEMAND IN CANADA"

Graham Eatherley, Telecom Canada, Ottawa, Ontario, Canada.

Telecom Canada, formerly the TransCanada Telephone System, is a consortium of Canadian telecommunications companies formed in 1931 to plan, develop, maintain and operate a national telecommunications network with a mandate to provide reliable, high-quality and economical long distance telecommunications services to the Canadian public. Since that time, Telecom Canada's role has evolved to include network planning and development and marketing in addition to carrier relations and revenue settlement. This relationship amongst the country's major telecommunications providers is unique in today's world and is in effect an efficient and amicable arrangement which has engendered a profitable and successful telecommunications industry providing services not only within Canada but in world markets as well. Cooperation, coordination and planning permit all member companies to work as one system.

The major activities are coordinated through the committee process, with each member company being represented on each committee. Major projects progress through the committee structure to the multi-disciplinary Management Committee, to be brought before the Board of Directors for executive decision.

The importance of the demand forecasting function in the Strategic Planning process is now fully recognized by Telecom Canada and member company executive staff. This fact is readily apparent from the interest and support expressed at Management Committee and Board of Directors meetings.

Future endeavours of the Central Staff Forecasting group will undoubtedly centre around message toll competition - a certainty within the Canadian telecommunications industry within this decade.

ECONOMETRIC METHODOLOGY AND FORECASTING

Chair: Camilo Dagum, Professor of Economics, Faculty of Social Sciences, University of Ottawa, Ottawa, Canada.

"ON THE USEFULNESS OF JAMES-STEIN TYPE SHRINKAGE ESTIMATORS FOR FORECASTING MACROECONOMIC RELATIONS"

P. J. Dhrymes and S. Peristiani, Columbia University, Department of Economics, International Affairs Building, New York, NY 10027, USA

This paper attempts to assess the usefulness of employing James-Stein type of 'shrinkage' estimators in forecasting macroeconomic relations. The approach to the problem is twofold. First, one may estimate autoregressive reduced form type relationships using James-Stein procedures to 'shrink' the coefficients so estimated and then generate forecasts. Alternatively, one may use an econometric model to generate forecasts in the usual way and then 'shrink' the resulting forecasts. Only the first phase is likely to be reported upon in the paper for the Conference, although work will continue on the second phase. We have at our disposal modules for the Wharton Mark III model and these are to be employed in the second phase. In the first phase we may also employ the data set accompanying these modules, which relate to a period terminating in 1975, or current sets of macro data, for the US economy.

"OFFICE PRODUCTS FORECASTS - A METHODOLOGY FOR LINKAGE TO THE ECONOMIC ENVIRONMENT"

F. Gerard Adams and Lynn Oppenheim, The Wharton School, Wharton Center for Applied Research, University of Pennsylvania, Philadelphia, PA 19104-3357, USA

This paper describes a methodology to derive medium term forecasts for a variety of narrowly defined office products. In order to assure consistency between the forecasts and the economic environment, a methodology was developed which linked the specific office product category through the input-output matrix to comprehensive macroeconomic forecasts of the US economy developed by Wharton Econometrics. This approach modified by survey derived information about technological and marketing changes provided robust predictions for many individual products. The approach has wide possibilities for application.

"BOUCLE PRIX-SALAIRES DES MODELES ET POLITIQUE ECONOMIQUE. OU EN EST-ON DE LA COURBE DE PHILLIPS?

Pierre Morin,

Les modèles économétriques de l'économie française intègrent un schema très simple d'interaction des salaires et des prix, que répresente un système réduit de trois équations, tel que le taux de croissance des prix dépende du taux de chômage, mais aussi de nombreux autres paramètres sur lesquels la politique économique peut agir.

Ses propriétés dynamiques, dans les cas d'une inflation importée ou d'une augmentation des coûts unitaires, mettent en particulier en jeu les tensions dues à un déplacement du partage du revenu.

Les propriétés du schéma peuvent être évaluées au vu des mouvements récents et contrastés de la hausse des prix dans la zone OCDE, dans un contexte de chocs externes, puis de la politique économique de lutte contre l'inflation poursuivie en France.

"ANALYZING RATIONAL AND ADAPTIVE EXPECTATIONS HYPOTHESES AND MODEL SPECIFICATIONS"

Camilo Dagum, Professor of Economics, Faculty of Social Sciences
University of Ottawa, Ottawa, Canada.

The main purpose of this study is to discuss the rational expectations (RE) hypothesis and its epistemological consequence and limitation in the specification of economic models. In particular, among the specific features that underly the poverty of this approach to account for the dynamic of observed economic processes are the elimination of history in the derivation of the reduced form model (by application of RE hypothesis formalization) and the interpretation of RE hypothesis as a two-person zero-sum symmetric game. This conclusion is further supported when rational and adaptive expectations hypotheses are compared and analyzed. Unlike RE, adaptive expectations (AE) models have memory, i.e. they are specified in historical time. Further, Wold's path models with latent (i.e. nonobserved, hence expected) variables fully account for both RE and AE models, and Wold's partial least squares method of estimation is the most efficient method to deal with models containing latent variables.

MACROECONOMIC FORECASTING AND INTERNATIONAL MODELLING I

Chair: John Llewellyn, OECD, 2 rue André Pascal, 75016, Paris, France.

"OECD'S CONTRIBUTION TO FORECASTING AND POLICY ANALYSIS"
John Llewellyn, OECD, 2 rue André Pascal, 75016, Paris, France.

Introductory remarks explaining OECD's role in international forecasting and international policy analysis; its international linkage model INTERLINK is central in these processes, serving to enforce data discipline, international consistency of the projections, and a systematic approach to policy analysis. The development of INTERLINK takes place largely in response to current and expected policy concerns; and methods of use of the model evolve over time, as experience is gained and the human capital of OECD staff and government committee members develops.

"THE STRUCTURE OF INTERLINK"
Peter Richardson, Head, Econometric Unit, Economics and Statistics Department, OECD, 2 rue André Pascal, 75016, Paris, France.

This presentation will summarise the main blocks of the INTERLINK model, outline the reasons for its structure, and indicate the basic properties. Some comparison with other world models will be offered and their similarities and differences discussed.

"THE MODELLING OF INTERNATIONAL INVESTMENT FLOWS"
David Coe, Head General Economics Branch, OECD, 2 rue André Pascal, 75016, Paris, France.

The large fluctuations in key exchange rates over recent years have revealed an important lacuna in international linkage models, namely the behaviour of investment flows between countries. The precise way in which these flows occur, and the values attached to them, have important implications for the assessment of the response of, inter alia current accounts to changes in exchange rates. In particular, any assessment of the likely reduction in international current account imbalances resulting from the recent substantial changes in the value of the dollar depends importantly on a correct understanding of the determinants of US investment income flows.

PREVISION ET EVALUATION TECHNOLOGIQUE II

Chair: P. de la Saussay, CPE, 1 rue Descartes 75231, Paris, France

"TRANSFORMATION DU SYSTEME TECHNIQUE ET PREVISION ECONOMIQUE : ELEMENTS D'UNE METHODOLOGIE"

P. de la Saussay, CPE, 1 rue Descartes 75231, Paris, France.

Le changement fondamental du système technique, caractérisé d'abord par la transversalité intersectorielle de ses manifestations, et par là même par ses relation système technique - système productif. Aussi impose-t-elle au prévisionniste de se doter d'outils d'analyse et de reflexion sur le long terme qui rendent compte de cette relation fondamentale.
L'approche proposée peut être caractérisée de la façon suivante :
- elle vise une prevision qui porte sur le long terme
- elle se concentre sur le niveau sectoriel (ou groupe de produit)
- elle se dote de deux outils d'analyse:
  . la mesure du système productif en quantités physiques (et non en valeur ou en volume)
  . et l'analyse des courbes en S et de leurs prolongements futurs.

Etant donné le caractère tout-à-fait provisoire et partiel d'un programme de travail en cours, on se limitera dans ce papier à définir quelques éléments de méthodologie qui, pour nous, constituent les fondements d'un renouvellement des instruments de modélisation méso-economique et de prévision ainsi que quelques résultats permettant de mieux concrétiser l'approche retenue.

"TRANSFORMATION OF THE TECHNICAL SYSTEM AND ECONOMIC FORECAST : TOWARDS A METHODOLOGY"

P. de la Saussay, CPE, 1 rue Descartes, 75231 Paris, France.

The current major change of the technical system characterized by its inter-industrial species and the dissemination effects it drags throughout the whole productive system puts to the forefront the two-way linkage between the technical system and the productive system.

This naturally leads the forecasters to build up new tools of analysis and long term thinking able to integrate this relation:
- the approach of this paper relates on a long term forecasting,
- it focuses on the sectorial level (or groupings of products),
- it relies on two specific tools, namely the assets of the productive system measured in physical quantity (and not in value or volume) as well as the S curves description and extension.

As the research is in progress, this paper tries to define the methodological aspects aiming at a renewal of the meso-economic modelling and economic forecast although some results will be presented.

"DIFFUSION DE L'INNOVATION ET CHANGEMENTS QUALITATIFS A TRAVERS DES ETUDES DE CAS"

Jean-Alain Heraud et Ehud Zuscovitch, BETA, Université Louis Pasteur de Strasbourg, France.

Le BETA s'est spécialisé depuis dix ans maintenant dans l'analyse économique de la constitution des technologies. Sa démarche est originale en ce sens qu'elle cherche à mettre en évidence le "comment" plutôt que le "combien" de ce processus. En effet, dans une structure productive en profonde transformation, il est illusoire de croire à la fiabilité des mesures habituelles du progrès technique. Que ce soit la fonction de production pour l'évaluation de la R & D ou l'emploi d'une logistique pour l'estimation de la diffusion de l'innovation, il s'agit de méthodes dont la portée est mise en cause par l'environnement qui change rapidement. Nous avons ainsi privilegié une approche qui tient compte des changements qualitatifs pour mieux apprécier l'orientation et l'amplitude du progrès technique. A travers quatre projets de recherche qui seront exposés, nous présenterons notre approche de la diffusion de l'innovation dans deux axes complémentaires. Nous étudierons en premier lieu la dimension structurelle de la diffusion a travers la constitution (le cas de l'espace) et la modification (le cas de la chimie) des réseaux technologiques. Nous analyserons en second lieu le phénomène de la diffusion dans sa dimension temporelle, c'est-à-dire vis-à-vis du stade d'évolution du système technico-économique. Dans ce cadre nous verrons d'abord le comportement de la firme face aux risques de la transition entre régimes (le cas du choix énergétique) pour envisager enfin les caractéristiques du nouveau régime de production intensif en information. Celui-ci posant le problème de la gestion industrielle de la variété et des interfaces entre plusieurs corps de savoir.

"DIFFUSION OF INNOVATION AND QUALITATIVE CHANGE"

Jean-Alain Heraud and Ehud Zuscovitch, BETA, Université Louis Pasteur de Strasbourg, France.

The BETA research team has been specializing for ten years now in the economic appraisal of technological development. Its originality is in the finding out the "how" instead of the usual "how much" of innovation. In situations of deep structural change, standard methods of assessment of innovation such as the production function approach to R & D performance or the logistic curve estimation for diffusion cease to be reliable. We have thus chosen a more qualitative view in order to deal with the rate and direction of innovation activities. Instead of the usual cross-section, we apply network concepts and instead of time series, we have adopted evolutionary approach to study the dynamics of technical systems. Four research programs have been selected to illustrate the above. We shall begin by studying the space industry on one hand, and the chemical industry on the other, as examples of building and restructuring of networks. We shall then proceed to the evolutionary pattern in two steps. We shall first analyze the behavior of the firm under technological transition induced, as well as independent, price uncertainty. We shall end up by understanding new features of the approaching information-intensive production systems in the field of advanced materials.

"BEHIND THE LONG PERIODS OF TECHNICAL TRANSFORMATION : THE INTER-INDUSTRIAL DYNAMIC SEQUENCE OF DISSEMINATION OF NEW TECHNOLOGIES"

Dr. Chris DeBresson - Economics - Concordia

Previous causal analyses of Kondratieff type long waves have either been attributed, in a reductionist fashion, to exogenous epoch making radical technological innovations (Schumpeter, Kuznets, Mensch...) or, with statistical agnosticism, to the probability of different cycles generating dynamic fluctuations of long duration (Forrester). Although historical and statistical explorations of such long term fluctuations are still limited and required, such analytical perspectives lack an economic rationale. The author considers inter-industrial economic space and the constraints of inter-industrial circulation to provide for stochastic modelling of the dissemination of new technologies. New technologies, according to this model are constrained in their diffusion by a set inter-industrial path along which a sequence of thresholds must be attained before diffusion mechanisms start up in new economic sectors. The model is illustrated with three case histories and summarizes the arguments since Kondratieff's articles.

SEASONALITY AND SEASONAL ADJUSTMENT METHODS

Chair: Augustín Maravall, Servicio de Estudios, Banco de España, Alcalá 50, 28014 Madrid, Spain.

"ON MINIMUM MEAN SQUARED ERROR ESTIMATION OF THE NOISE IN UNOBSERVED COMPONENT MODELS"

Augustín Maravall, Servicio de Estudios, Banco de España, 28014 Madrid, Spain.

In model-based estimation of unobserved components, the minimum mean squared error estimator of the noise component is different from white noise. In this paper, some of the differences are analysed. It is seen how the variance of the component is always underestimated, and the smaller the noise, the larger the underestimation. Small noise components will also be associated with large autocorrelation in their estimators. Finally, in the context of an application, the sample autocorrelation of the estimated noise is seen to perform well as a diagnostic tool, even when there is little noise and the series is of relatively short length.

"A QUANTITATIVE ANALYSIS OF THE INFLATION PROCESS AND MONEY SUPPLY IN SPAIN"

M. Cruz Manzano, Antoni Espasa, Banco de España, 28014 Madrid, Spain.

Inflation is still one of the main problems in the Spanish economy. The monetary policy, understood as the set of available measures by which the authorities try to control the rate of growth of a certain monetary aggregate, has occupied, and still does occupy, an important place in the battle against inflation.

The aim of this paper is to derive a reliable method of forecasting the rate of inflation in Spain. An analysis of the Spanish consumer price index is made; and in this paper we show that this must be done by breaking down the index into its basic components: non-processed food (15.55%), processed food (17.48%), services (34.51%), energy (7.00%) and manufactured goods (25.46%). The data used is monthly, from 1978-1985. In the paper the following type of models are used:

1) univariate (Arima plus intervention models).
2) monetarist econometric models.

The univariate models employed make for forecasting functions with varying parameters; in this functions there is usually a linear trend. In this paper we estimate the expectations of inflation in the medium term by means of the slope of this trend. With the monetarist models we are able to estimate the dynamic relationships between money and prices, and thus we can assess the time that elapses before monetary policy affects inflation, and the possible trade-off between inflation and unemployment.

A comparison is made of both types of models on the basis of their predictive capacity, and a simulation of heir performance in recent years is carried out.

In addition, we advocate the usefulness of evaluating any improvement or deterioration in the inflationary situation, by comparing the current estimation of the trend of the consumer price index with a previous estimation.

"MEASURING DATA ROBUSTNESS IN ARIMA MODELS"

Daniel Peña, Banco de España, 28014 Madrid, Spain.

This paper explores measures of change in the vector of parameter estimates when one observation is assumed to be missing, and how these measures can be used to establish data robustness. The methodology will be illustrated with several examples.

"MODELISATION DE SERIES CHRONOLOGIQUES SAISONNIERES POUR LA PREVISION A COURT TERME"

M. Borgard et son équipe, Gaz de France, Paris, France.

On etudie le modele explicatif saisonnier etabli d'apres la theorie de BOX-JENKINS.

1) A travers plusieurs ecritures privilegiant soit la partie auto-régressive soit la partie moyenne mobile on visualise les différences dans les profils des séries étudiées.

2) On developpe les formules de prevision et on étudie leur resistance a differents chocs produits sur les donnees.

3) On donne la formulation complete des erreurs de previsions et leur illustration en fonction des variations et des erreurs sur les paramètres. On étudie, enfin, le problème de l'agrégation des prévisions de N séries.

LA PREVISION DE DEMANDE D'ELECTRICITE

Chair : Michel Bénard, Chef du Département Economie Externe, Etudes Economique Genérales, EDF, France.

"PREVISION JOURNALIERE DE LA COURBE DE CHARGE A ELECTRICITE DE FRANCE"
Philippe Rabut, Directeur des Etudes et Recherches, EDF, France.

La Prévision de la courbe de charge à l'horizon de 48 h est un préliminaire à l'élaboration quotidienne du plan de production des centrales d'énergie électrique.

Nous décrivons la méthode de prévision utilisée à Electricité de France; cette méthode s'appuie sur le fait que la consommation d'électricité se caractérise par une combinaison d'évolutions régulières (croissance, saisonnalité), d'évolutions presque cycliques (cycles hebdomadaires et journaliers) et d'évolutions à caractère beaucoup plus aléatoire : influence de la température, jours de fête ou de changement de période tarifaire.

Les performances du modèle permettent une précision de la prévision inférieure à 2% à 24 h.

"LE MODELE TRIMESTRIEL DE PREVISION DE CONSOMMATION : PRESENTATION DETAILLEE"
Pierre Lacombe, stagière; Fabrice Hatem, ingénieur; Michel Houssemenne, ingénieur; Service des Etudes Economiques Générales EDF.

Ce modèle fournit des prévisions à court terme (1-2ans) destinées à l'élaboration du budget d'Electricité de France.

Les consommations des secteurs industriels sont approchées par des relations économétriques.

Les usages thermiques du domestique sont représentés par une formulation analytique. Les autres usages du secteur résidentiel-tertiaire font l'objet d'une approche économétrique.

Le passage des consommations aux livraisons par niveau de tension s'effectue à l'aide de clefs de répartition.

Des sorties finales sont présentées en annexe

MODELES DYNAMIQUES SUR DONNEES MICROECONOMIQUES

Chair: Alain Trognon, Ecole Nationale de la Statistique et de l'Administration Economique, France.

"MODELES DYNAMIQUES DE PANEL A COEFFICIENTS ALEATOIRES"

F. Kria, Université de Tunis.

Dans cette note, nous proposons d'abord d'adapter au contexte dynamique le modèle à double indice présenté par SWAMY. Les propriétés statistiques du modèle, les méthodes efficaces d'estimation et les propriétés asymptotiques des estimateurs sont étudiées. Il est ensuite question de proposer une méthode d'estimation alternative à celle obtenue par les moindres carrés généralisés. Cette méthode, appelée méthode de la covariance, tout en garantissant les mêmes propriétés asymptotiques que dans le cas des moindres carrés généralisés, offre un avantage du point de vue du calcul numérique des estimateurs: elle n'exige pas l'estimation préalable de la matrice des variances covariances des coefficients aléatoires.

"EFFICACITE DES PROCEDURES D'ESTIMATION EN DEUX ETAPES DANS LES MODELES DYNAMIQUES"

P. Sevestre, Paris I et A. Trognon, ENSAE, France

Pour les modèles dynamiques a erreurs sériellement corrélées les estimateurs en deux étapes parmi lesquels les moindres carrés quasigénéralisés sont généralement convergents. En revanche, ils peuvent ne pas être asymptotiquement efficaces. Aussi Hatanaka a-t-il proposé, au debut des années soixante-dix, une procédure d'estimation en deux étapes simple à mettre en oeuvre et asymptotiquement efficace. Cet article a pour but de généraliser cette procédure dans le cadre des M-estimateurs. Les solutions présentées sont appliquées aux modèles dynamiques à erreurs composées.

"UN MODELE ECONOMETRIQUE DE MARCHE INTERNE DU TRAVAIL"

F. Bourguignon et P.A. Chiapori, EHESS et Ecole Normale Supérieure Ulm, France

Une caractéristique souvent observée des marchés internes du travail (Malcomson, Odagiri) est que le salaire y résulte largement de négociations collectives, avec notamment deux conséquences marquées; tout d'abord, une part importante des augmentations salariales s'opère de façon non différenciée (i.e. s'applique à l'ensemble des travailleurs occupant un poste d'un type donné, ou appartenant à une categorie particulière); ensuite, les critères formels (ancienneté, ...) jouent un rôle prépondérant dans l'évolution du salaire d'un agent donné au cours de sa carrière. Il en résulte que, si l'on veut étudier les disparités de carrière a l'interieur d'une organisation à marché interne, il est beaucoup plus judicieux de considérer, plutôt que l'évolution du salaire, les promotions hiérarchiques dont l'agent fait l'objet. En d'autres termes, les différences dans les profils de carrière, en termes de niveaux hierarchiques, sont beaucoup plus révélatrices des disparités individuelles et des mécanismes de sélection interne, que les évolutions des profils de revenu.

Le but du présent article est de développer et d'estimer économétriquement un modèle d'organisation à marché interne, fondé sur les promotions hiérarchiques. A la différence des appoches de type théorie des contrats,

il se veut positif et non normatif; autrement dit, son propos n'est pas d'expliquer la structure de marché interne, en la présentant comme la réponse optimale à un certain environnement. Il s'agit au contraire, à partir d'une telle structure, prise comme donnée (heritée du passé, par exemple), d'en étudier les caractéristiques et leurs conséquences sur le comportement intertemporel des agents.

"CONSISTENT ESTIMATORS FOR DYNAMIC ERROR COMPONENTS MODELS: A COMPARATIVE SIMULATION STUDY"

P. Sevestre, Université Paris-Val de Marne, 58 Av. Didier, 94210 La Varenne St. Hilaire, France.

The usual error components model estimators (such as OLS, Between, Within, and GLS estimators) are known to be inconsistent when the model is dynamic and T is finite. This has led several authors to propose consistent estimators for these models, by applying, for instance, OLS to the model written in temporal means.

These estimators are known to be consistent for finite T but little is known about their asymptotic variance, nor about their behavior in finite samples.

The aim of our paper is then to give some insights about the second point that is their small sample behavior.

The main results of our simulation study can be summarized as follows:

One always gain in terms of bias and MSE by using two-step estimation methods based on consistent estimations of the unknown parameters that they involve.

The Quasi - estimator most often overrides the Quasi-GLS one. But the differences between them are very small. Moreover, the former cannot be computed in some cases (in particular when the coefficient of the lagged endogenous variable is close to 1).

In most cases, the Balestra-Nerlove estimator appears to be the best choice among the "one-step" instrumental variables estimators. But when the endogenous variable is only slightly autocorrelated, this is the second estimator proposed by Anderson and Hsiao which must be preferred.

As a consequence, the best feasible estimators are the two-step estimators based on the Balestra-Nerlove estimation of the intra-class correlation coefficient (except when the endogenous variable is slightly autocorrelated and the ratio of the individual variance to the total variance is close to 1. In that case, the best estimators are the two-step estimators based on the second Anderson-Hsiao estimation of this parameter.)

SOCIAL AND MEDICAL FORECASTING

Chair: M. Daub, Queen's University, School of Business, Kingston, Ontario K7L 3N6, Canada.

"AIDS FORECASTING : THE CANADIAN EXPERIENCE"

Ian MacNeill, Department of Statistical and Actuarial Sciences, The University of Western Ontario, London, Ontario, Canada.

On the basis of early reports of incidence of Acquired Immuno-Deficiency Syndrome (AIDS) in Canada, the Laboratory Centre for Disease Control of Health and Welfare Canada issued forecasts of 20,000 Canadian AIDS victims by 1989. These forecasts were made on the basis of a simple exponential growth model with rather crude estimates for the parameter. Analysis of monthly data using a logistic model results in forecasts of approximately 2,000 incidences by 1989. Furthermore, application of the Adaptive Forecasting and Estimation by Chance Detection (AFECD) procedure to this data suggests there may have been unidentified structural changes in the monthly time series, possibly due to changes in the reporting and/or diagnostic procedures. A possible implication of these structural changes is that the level of incidence is even closer to a plateau than implied by the logistic model.

"FORECASTING AND THE LAW : LIABILITY AND INTELLECTUAL PROPERTY CONSIDERATIONS"

Professor M. Daub, School of Business, Queen's University, Kingston, Ontario K7L 3N6, Canada and A. Lefas Daub, Osler, Hoskin and Harcourt, Barristers and Solicitors, Ottawa, Canada.

Because of the particular nature of forecasting as an economic activity, public policy to control it has largely consisted of civil suit and prior trademarking. The paper discusses why this is the case concentrating on the public good aspects of forecasting information. Further it considers at some length the standards of liability for forecasting error which have developed in the common law systems of the U.S., U.K. and Canada, commenting in particular for illustration purposes on several recent Canadian cases which involved forecasting as a central issue.

"A NEW ATTITUDE : INTEGRATED ECONOMICS IN A NON-INTEGRATED SYSTEM"

M. Spain, Ph.d., Case Western Reserve University, Cleveland, Ohio 44106, USA; T. Allmond, City of Cleveland Mayor's Office of Equal Opportunities, Cleveland, Ohio 44106, USA and M. Crockett, State of Ohio Department of Development, Cleveland 44106, USA.

A trend has developed which creates an opportunity for integrated economics in a non-integrated system. This trend creates partnerships between majority-owned companies and minority or disadvantaged companies through the utilization of franchises, subsidiary of affiliate companies.

This trend reflects a "new attitude" which is based not on the desire to integrate the system, but rather to increase profits for both companies. Results of analysis on the effectiveness of this "new attitude" will demonstrate the consequence of this process formation and its potential impact on the political and economic systems.

"SOCIAL CHANGE AND INFORMATION TECHNOLOGY - IN THE HOME"

Bal Maghera, Taylor Nelson Monitor, Taylor Nelson House, 44-46 Upper High Street, Epsom, Surrey KT17 4QS, U.K.

The case is extended for using Monitor's Social Model of the UK as a tool for forecasting and strategic planning*. The paper describes the model in brief and proceeds to explore various applications of IT in the home - entertainment, health care, work and so on - in the light of Social Change. The likely acceptance, demand and possible side effects of IT in these fields are looked at 20 years ahead on the basis of changing values, beliefs and lifestyles in the various sections of the population. The implications, of such acceptance and demand, on the infrastructure are examined.

Increasing demand for IT in the home is seen - but the paper shows how the rate of adoption and the approach will vary enormously depnding upon which two scenarios becomes dominant. Monitor's view is put forward.

*At the ISF Conference in 1984 Mrs Christine MacNulty, M.D. of Taylor Nelson Monitor, discussed Monitor's Social Model in some detail.

"IMPROVING GROUP FORECASTS WITH SPRITE"

K. McGown Ph.D., Director, Concordia University, 1455 de Maisonneuve Blvd. West, Montreal, Quebec H3G 1M8, Canada.

As business decisions become increasingly complex, the need for accurate long-range market forecasting techniques also increases. Technological forecasting methodologies are increasingly being adopted and utilized by corporations - methodologies once used primarily by "think tank" institutions and for military applications. One of these, the Delphi technique, has been widely used for the past twenty years.

This paper describes a newer experimental technique developed as an alternative to the Delphi method. The SPRITE (Sequential Polling and Review of Interacting Teams of Experts) technique, unlike Delphi, does not seek consensus. It permits an orderly development of dissenting views by panelists, placing emphasis on the developments of different inputs.

A study, conducted at Bell Canada and using the impacts of the "wired city" is presented.

POLITICAL FORECASTING

Chair: Andre Donneur, Professeur, Université du Québec à Montréal, Dept. de Science Politique, Case Postale 8888, Montréal Québec H3C 3P8 Canada.

"FORECASTING AND THE OUTBREAK OF WAR"

G. R. Lindsey, Chief, Operational Research and Analysis Establishment, Department of National Defence, 101 Col By Drive, Ottawa K1A 0K2

There have been wars in which the instigator forecast a result favourable to himself and subsequently succeeded as planned. there have been many periods in which forecasting of political developments caused powers to make concessions without which wars, or at least revolution and violence, would have occurred, and whose outcome would probably have been unfavourable to the powers concerned. Thus, we can find examples in which good forecasting caused wars, and in which it prevented wars.

Examples are easier to find in which wars were instigated or at least allowed to occur by powers who had forecast a favourable result which was not in fact obtained. Amonst these are wars in which short-term tactical success was correctly forecast, but this was followed by long-term attrition and economic collapse which could have been but was not foreseen.

Some wars have been encouraged or at least allowed to occur because of the attitude or lack of action of the victim of aggression, often due to his poor forecasting of what was going to happen, and his vulnerability to surprise.

The paper examines historical examples of each of these situations, and also analyzes the link between forecasting and strategic nuclear deterrence.

"SIMULATION AND MANAGEMENT OF CRISIS"

Urs Luterbacher, Professeur, Inst. Univ. de Hautes Etudes Internationales, 132 rue de Lausanne, C.P. 36, CH 1211 Geneve 21.

No abstract.

NEW PRODUCT FORECASTING

Chair: Professor Gert Assmus, Amos Tuck School of Business Administration, Dartmouth College, Hanover NH 03755, USA.

"VALIDATION RECORDS OF FOUR PRE-TEST MARKET FORECASTING MODELS FOR NEW CONSUMER PRODUCTS"

Dr. Lynn Y. S. Lin, Burke International Research Corp., 800 Broadway, Cincinnati, Ohio, 45202 U.S.A.

Pre-test market forecasting models have been available since 1970. During the last fifteen years, almost a dozen new product forecasting models have been offered by Marketing Research agencies for use by the consumer goods manufacturers throughout the world. These consumer goods early forecasting models all utilize consumer survey data to forecast new products' sales potentials either in long-term market share or sales volume, without the benefits of actual sales data. Validation of forecasted sales versus actual market performance are now available for many of these forecasting models. This paper intends to summarize the most recent available validation track records of the four most popular models (BASES, ASSESSOR, ESP and SENSOR) to show the advancement of its development and accuracy.

"DETERMINATION OF THE UNCERTAINTIES IN S-CURVE LOGISTIC FITS"

A. Debecker and T. Modis, Management Science, Digital Equipment Corporation, 65 Chemin l'Etang, 1219 Geneva, Switzerland.

Look-up tables and graphs are provided for determining the uncertainties during logistic fits, on the three parameters M, and describing an S-curve of the form:

$$S(t) = \frac{M}{1 + e^{\alpha t + \beta}}$$

The uncertainties are given as a function of the uncertainty on the data points and the length of the historical period. Correlations between these three variables are also examined.

The study is based on some 40000 S-curve fits on simulated data covering the different conditions and carried out via a X minimization technique. A rule-of-thumb general result is that given at least half of the S-curve range and a precision of better than 10% on each historical point, the uncertainty on M will be less than 20% with 90% confidence level.

"THE ANALYTICAL HIERARCHY PROCESS AS A FRAMEWORK FOR FORECASTING"

Raj. G. Javalgi, College of Business Administration, Marquette University, Milwaukee, WI 53233 USA and Colleen McDonnell-Wieczorek, School of Business Administration, Department of Finance, Montclair State College, Upper Montclair, NJ 07043 USA.

Various approaches such as conjoint analysis, logit, probit, and elimination-by-aspect models have been employed to solve marketing problems that involve the selection of an alternative. The present paper uses the Analytical Hierarchy Process (AHP) developed by Saaty (1980). The major distinction of this approach is that it structures any complex, multi-criterion problem hierarchically. The model employs pairwise comparisons

using the subjective scale developed by Saaty. The pairwise comparisons are done in terms of which one element dominates another. These judgements are then expressed in integers. This approach is illustrated in an application to the prediction of consumer choice behavior. Guidelines for strategic implications are provided.

"THE IDENTIFICATION OF VARIABLES AND THE EVALUATION OF FORECASTING TECHNIQUES FOR DETERMINING THE SUCCESS RATE OF NEW PRODUCTS"

Cynthia Webster, PH. D., Department of Marketing, School of Business and Administration, St. Mary's University, One Camino Santa Maria, San Antonio, Texas 78284-0400 USA.

This paper presents an approach for identifying the salient variables and evaluating several techniques for forecasting the success rate of new products.

First, discriminate analysis results in the identification and weighting of those independent variables that best explain, and consequently predict, the success rate of a particular product. Second, the proxy variables and appropriate time-series data are identified. Third, the data are used to test the effectiveness of several of the most commonly-used forecasting models. As a final result, the model that establishes the most accurate forecast is identified.

LEADING INDICATORS AND SURVEY DATA

Chair Philip A. Klein, The Pennsylvania State University, Department of Economics, 613 Kern Graduate Building, University Park, PA. 16802, USA.

"PURCHASING MANAGERS SURVEY DATA: THEIR VALUE AS LEADING INDICATORS"

Philip Klein, The Pennsylvania State University and Center for International Business Cycle Research, Columbia University and Geoffrey H. Moore, Center for International Business Cycle Research, Columbia University, USA.

Many papers by us as well as others have considered the possibilities for improving leading indicators of business cycles by utilizing qualitative survey data as well as quantitative indicators. Even when the qualitative indicators have been shown to lag behind the quantitative indicators they often are less erratic or become available more promptly, which may make them more valuable than quantitative indicators in forecasting subsequent economic developments.

The National Association of Purchasing Management in the United States has been collecting survey results monthly from about 250 companies in the U.S. since the late 1940's. The NAPM survey includes the net balances from purchasing managers' replies to questions dealing with new orders, production, vendor deliveries, inventories, prices, and employment, as well as a composite index including all these net balances. In a recent study (for the CIRET conference in Vienna, September 1985), we included the NAPM price survey in our analysis of the use of qualitative data in forecasting inflation rates. We propose now to broaden the approach to consider how well each of the survey variables correlates with the cyclical movements in the relevant quantitative series (that is, do new orders surveys correlate well with actual new orders, etc.). We shall also evaluate the components and the composite index with respect to their value as leading indicators of business cycles in the U.S. economy. Hence the study should add to our overall knowledge of the general forecasting applications of qualitative indicators in comparison with quantitative indicators.

"DOES THE INDEX OF LEADING ECONOMIC INDICATORS LEAD?"

James A. Wilcox (with Roger Craine and Arthur Havenner), 350 Barrows Hall, U.C. Berkeley, Berkeley, CA 94720, USA

This paper conducts formal tests of the ability of the index of leading economic indicators to predict recession and recovery in the macroeconomy. The test results show that smoothing the index over time produces more informative forecasts. We find that using the common rule that "three declines in a row in the index," for example, produces statistically significant forecasting ability.

"IMPROVING TIME SERIES FORECASTS BY USING EXPECTATIONS FROM SURVEY DATA"

Dr. Hans-Georg Blang, Universitat Siegen, Fachbereich 5, Holderlinstr 3, D 5900 Siegen, Germany.

Predictions could be obtained by using econometric models, the techniques of time series analysis or expectations formed by experts or based on survey samples. Each one of these methods exhibits limited scope. Thus the question arises whether optimal combination of different procedures could improve forecasts. In this paper a general time series approach is introduced that additionally includes survey expectations data in order to achieve sharper predictions than both time series forecasts or expectations of survey participants. Examples are given for some industry specific variables as selling prices and production using expectations data by the German Business Test of the Ifo Institute.

PRICE ELASTICITIES IN THE NEW COMPETITIVE LONG DISTANCE COMMUNICATIONS MARKET

Chair: P Falchi, GTE Sprint, USA.

Discussant: W Taylor, Bellcore, USA

"SIMULATION OF TIME-OF-DAY ELASTICITIES USING AGGREGATE ELASTICITY AND WINDOW-OF-CONVENIENCE DEMAND PROFILE"

Minh Nguyen, AT&T Communications International Network Planning, USA.

To provide for the increasing demand of TOD (Time-Of-Day) forecasts, price elasticities, plus many other rate-evaluating and marketing-research segment requirements - e.g. country pairs, types of call, etc., the dimensions of the time-series/cross-section models and the required statistical expertise will increase exponentially to, at times, the point of impracticality. This paper proposes a simple algorithm that will simulate time-of-day paramederS/forecasts using aggregately derived elasticity and the respective window of convenience.

By window of convenience, we mean there are periods during the day that are more convenient and attractive to long distance users than others. Empirically, this involves finding a proper inverse relationship between TOD loads and elasticities. TOD demand is a function of:

a) window of convenience (CW) which can be of polynomial or spectral form.

b) TOD price differential with respect to all-day average price (TODP). The average price for the day is set at unity, against which all TOD price levels are differentiated.

c) consumers' opportunistic behavior as indicated by the distributional lumps (surges) in the lower-rate immediate neighborhood of the rate demarcation lines. Through interactive stochastic regression, a power transformation of a non-monotonic combination of linear functions is derived as a proxy.

d) all other variables - income, seasonality, market maturity ..., are assumed to be the same throughout the day (OTHERS), i.e. they are assumed not to interfere with the distribution of TOD loads.

"ESTIMATION OF PRICE ELASTICITIES BY TIME-OF-DAY FOR THE INTERNATIONAL TELEPHONE SERVICE"

Glenn Hunger and Muthu Natarajan, AT&T Communications, USA.

To predict customer responses to various time-of-day tariff levels and structures and to predict their reaction to new services and multiple telecommunication carriers, price elasticities are necessarily required at a more disaggregate level. The paper first addresses the traditional approaches in estimating aggregate own and cross price elasticities. Aggregate elasticities, however, may misstate the response by a group of customers to which a proposed rate scheme and/or a new service is targeted. One step in addressing the shortcomings of applying an aggregate elasticity is to calculate elasticities that vary by the time of the day. However, the estimation of elasticities by time-of-day using traditional econometric techniques is limited by the absence and/or expense of maintaining disaggregated traffic data, by the infrequency of time-of-day rate changes,

and by the associated statistical and applicational difficulties. These problems make the analysis seemingly intractable.

The paper examines the theoretical construct and application of incorporating traditional estimates of aggregate elasticities with a heuristic approach to derive elasticities by time of the day. Comparisons are made on preliminary data between the approaches in estimating customer responses to structural rate changes using aggregate price elasticities with the results to responses using time-of-day elasticities.

"RANDOM COEFFICIENT SYSTEMS OF DEMAND EQUATIONS : AN APPLICATION TO TELECOMMUNICATIONS DEMAND IN THE US"

J. Gatto and Scott Stephen, Economists, AT&T Communications, USA and
H. Kelejian, Professor of Economics, University of Maryland, USA.

In the telecommunications industry, there is considerable utilization of demand models for forecasting and policy analysis. Given the increasingly competitive environment in the domestic US telecommunications marketplace, there is a particular interest and need to develop demand models within the framework of systems of demand equations. Among other things, these systems explicitly account for the cross-elasticities, that is the degree of substitutability, between various alternative services. Although attractive in principle, the estimation of such systems in practice is often hampered by large degres of collinearity between the prices and other explanatory variables, and/or the lack of sufficient time-series data.

The first purpose of this paper is to cost typical systems of demand equations into a generalized RCR framework. The systems of demand equations which result possess properties which are stochastic generalizations of certain microeconomic principles common in the analysis of demand systems. These include stochastic versions of symmetry, weak separability, and homogeneity of degree zero. These RCR demand systems contain fewer fixed parameters, and thus offer the potential for considerable efficiency gains in the prediction of these parameters and the forecasting of the dependent variable.

The second purpose of this paper is to apply an RCR demand system to segments of the domestic US telecommunications industry. Finally, we compare and contrast the results of this model with those of a fixed coefficient approach. Particular emphasis is placed on the comparison of the parameter estimates and ex-post forecasting performance.

EXPERT SYSTEMS AND FORECASTING

Chair: Susan Pinson, Universite de Paris II and Rob R. Weitz, Decision Sciences and Information Systems, INSEAD, Fontainebleau, France.

"AN EXPERT SYSTEM FOR INDUSTRIAL MARKETING STRATEGY FORMULATION"
Jean-Marie Choffray, ESSEC, Avenue de la Grande Ecole, B.P. 105, 95021 Cergy-Pontoise France.

This paper presents an experimental zero order expert system for industrial marketing strategy formulation. The system is built as part of an interactive micro computer software aimed at helping industrial marketers tune their marketing strategy in reaction to unexpected competitive actions. The performance of this new approach is fomally assessed through a comparison with the courses of action chosen by a group of experienced managers in similar decision situations.

"FOREX: A TIME SERIES FORECASTING EXPERT SYSTEM"
Robert L. Goodrich, Scientific Systems Inc., Cambridge, MA 02140 USA.

Practical experience and pragmatic study (e.g. Makridakis et al.) have demonstrated that the best forecasting technique for a particular problem depends upon characteristics of the data, the various techniques, and the use to be made of the forecasts. FOREX is an expert system, programmed in PROLOG for the IBM PC/XT/AT, to help the practitioner decide which method(s) are appropriate in a given situation. FOREX is a production system resting upon a knowledge base assembled from published and unpublished sources. It incorporates the Dempster-Shafer theory of evidence to integrate multiple sources of knowledge about a particular problem.

"SYSTEME EXPERT DE PREVISION"
Robert Azencott, l'Universite de Paris-Sud Orsay, Paris France.

Methodes de Box-Jenkins univariee et multivariee presentation du moteur d'inference (approche probabiliste et statistique).

"NOSTRADAMUS: A KNOWLEDGE BASED FORECASTING ADVISOR"
Rob R. Weitz, Decision Sciences and Information Systems, INSEAD, Fontainebleau, France.

Selecting an appropriate forecasting method for a particular problem is an important and complex task. This research involves the development of a working, prototype expert system for guiding the user through the process of choosing an appropriate forecasting technique. Knowledge-based, or "expert" computer systems are to date the most commercially practical outcome of research in the field of Artificial Intelligence. This article (1) describes an expert forecasting system (called NOSTRADAMUS), and (2) outlines future work toward broadening and improving the knowledge and capabilities encompassed by this system. An expert system based approach offers the possibility of additional insight, and improvement in the theory and practice of forecasting and planning.

which potential new products were evaluated by key company personnel. In this manner, it organised intuition and logic into a framework for objective decision making. The model seemed both reliable and efficient given the number of key personnel involved.

"SELECTING AN OPTIMUM PORTFOLIO IN A CHANGING ECONOMIC ENVIRONMENT, AN APPLICATION OF MULTICRITERIA DECISION MODEL"

Potkin Basseer, Fairleigh Dickinson University, Rutherford, NJ 07070 USA and Nick Bahmani, Monclair State College, Montclair, NJ 07043 USA

The purpose of this paper is to apply the Analytical Hierarchy Process (AHP) in selecting an optimum Portfolio for three explicit types of sectors; a financial institution, an industrial corporation and a government agency, under various economic conditions. The selection process takes into account the following factors: the investments' characteristics which we refer to as; liquidity, safety of principals, income, capital appreciation and taxability. The other set of characteristics are the investment alternatives which include: the Money Market Fund, Government and Municipal Bond Fund, Balanced Fund, Corporate Bond Fund, Blue Chip Stock Fund. This study indicates that AHP can add a new perspective to the analysis of portfolio selection and provides researchers an alternative mechanism to the expected utility maximization approach.

MACROECONOMIC FORECASTING AND INTERNATIONAL MODELLING II

Chair: John Llewellyn, OECD, 2 rue Andre Pascal, 75016, Paris, France.

"THE TREATMENT OF SUPPLY IN INTERLINK"

Peter Jarrett, Principal Administrator, Growth Studies Division, OECD, 2 rue André Pascal, 75016 Paris, France.

Over the last two years, considerable effort has been put into the modelling of supply, in part because the emphasis on this aspect of economic performance by a number of OECD Member governments, and in part because any convincing macroeconomic assessment of medium-term prospects, and any associated simulation capability, can be conducted only in the context of a model in which supply is fully articulated.

"EARLY LESSONS FROM MEDIUM TERM PROJECTIONS"

Derek Chambers, Principal Administrator, Economic Prospects Division, OECD, 2 rue André Pascal, 75016 Paris, France.

The OECD has over the last year sought to examine systematically some of the likely key determinants of medium-term economic performance. Important elements in this (unpublished) work include the determination of supply (see Mr. Jarrett's presentation) and the transmission of economic impulses between countries - notably the evolution of international current account imbalances. This medium-term work is being conducted using INTERLINK, and a number of interesting conclusions are emerging, some of them methodological, as a result of the discipline of using just the single model to extend short-term, essentially demand-driven, projections into the medium-term, more supply driven area.

"PRESENT EXPERIENCE WITH FORECASTING USING AN INTERNATIONAL LINKAGE MODEL"

Nicholas Vanston, Principal Administrator, Economic Prospects Division, OECD, 2 rue André Pascal, 75016 Paris, France.

The basic way in which the INTERLINK model is used, or has been used in the past, in the construction of the OECD short-term projections has been described elsewhere (references available). However, the recent collapse of the world oil price, which necessitated an urgent reassessment of the short-term outlook, by Member countries and the OECD alike, threw up new challenges. Member countries and the OECD had to analyse unusually quickly the likely consequences of a shock which was both large and common to all countries, even though some of them were in very different circumstances. These results fed in quickly to emerging policy discussions, and the story of the interaction between models, forecaster, and policy analysts is an interesting one.

ANALYSE DES STRATEGIES D'ACTEURS I

Chair: K. Valaskakis, Institut GAMMA, 3764 Cote des Neiges, Montreal, Quecbec H3H 1V6, Canada.

"RESUME DE L'ANALYSE DE L'ALLIANCE STRATEGIQUE A LA STRATEGIE D'ALLIANCE"

J. Arlandis, Ministere des PTT, 20 Avenue de Segur, 75700 Paris, France.

L'environnement de l'entreprise a change : aucun secteur industriel ne releve d'une economie certaine; le secteur des technologies de l'information (informatique et telecommunication) est revelateur des strategies d'alliance vers lesquelles s'orientent les firmes : en multipliant les accords inter-entreprises, IBM, NEC et les autres, se constituent de veritables portefeuilles d'alliance.

La constitution de ces portefeuilles se fait au nom d'une logique strategique que cet article s'efforce de mettre en evidence : si la strategie classique permettait a l'entreprise de se poser les problemes qu'elle pensait pouvoir resoudre, la strategie d'alliance doit permettre de se poser egalement les problemes qu'on ne sait pas resoudre aujourd'hui pour etre en situation de les resoudre demain.

"RESUME DE L'ANALYSE DE L'ALLIANCE STRATEGIQUE A LA STRATEGIE D'ALLIANCE"

J. Arlandis, Ministere des PTT, 20 Avenue de Segur, 75700 Paris, France.

The environment of the company has changed : no industrial sector reveals certainty in its economy; the information technology sector is a good illustration of the new strategy led by firms : by multiplying inter-company agreements, IBM, NEC, etc, are building real portfolios of alliances.

The constitution of such portfolios will follow a strategic approach such as this article tries to point out : whereas the classical strategy allowed the company to reveal problems it will be able to solve, the alliance strategy also enables the firm to point out problems that are known as not to be solved today, but in the near future.

"ANALYSE DE LA STRATEGIE DES FIRMES DANS L'INDUSTRIE MINIERE"

P. Giraud, Directeur du CERNA, Ecole Nationale Superieure des Mines de Paris, Professeur associe a Paris - IX Dauphine, France.

Un flechissement historique des tendances de la consommation, intervenant apres le boom des investissements des annees 65-75, a provoque au debut des annees 80 la plus grave crise que l'industrie miniere mondiale ait eu a affronter depuis la seconde guerre mondiale. Face a la necessite d'adaptations de grande ampleur, les strategies des principales firmes minieres et metallurgiques privees ou publiques, ont ete tres differenciees. Ces strategies sont analysees a l'aide d'une methode mise au point par les

equipes du CERNA, Centre d'Economie des Ressources Naturelles de l'Ecole Nationale Superieure des Mines de Paris. Cette methode definit de maniere quantifiee l'espace de liberte des firmes sur un diagramme capacite de production/cout operatoire puis analyse les fonctions objectifs et les strategies des principaux acteurs pour conclure par l'elaboration de scenarios prospectifs.

"SONDAGES D'OPINION ET PREVISION"

Jacques Antoine, Professeur au CNAM, 2 rue Conte, 75003 Paris, France.

Les etudes prospectives montrent que l'environnement social, culturel et politique joue, pour l'avenir des nations et des entreprises, un role aussi important que l'environnement technologique et economique. Or les outils d'analyse de cet environnement sont peu nombreux et pour beaucoup d'entre eux uniquement qualitatifs. Les sondages d'opinion, qui s'efforcent de quantifier l'environnement social, culturel et politique, peuvent-ils fournir des bases a la prevision et a la prospective?

On soulignera d'abord les limites des sondages d'opinion dans cette perspective. On indiquera ensuite a quelles conditions ils pourraient jouer un plus grand role: barometres reguliers constituant des series chronologiques, comparabilite internationale, possibilite d'analyse des resultats selon trois niveaux: opinions (pour la conjoncture a court terme), attitudes (pour les evolutions a moyen terme), valeurs de societe (pour la prospective a long terme). On indiquera egalement une nouvelle voie de recherche sur la versatilite des opinions et comportements individuels et sur une nouvelle lecture de certains phenomenes de societe qui lui sont lies.

"OPINION POLLS AND FORECASTING"

Jacques Antoine, Professor at CNAM, 2 rue Conte, 75003 Paris, France

Long term studies have revealed that social, cultural and political environment is of equal importance as technological and economical environment for the future of nations and firms. But environmental screening tools of this kind - social, cultural and political - are not many, and most of them are only qualitative. Can opinion polls - which intend to quantify various aspects of social, cultural and political environment - provide material for medium and long term forecasting?

The limits of opinion polls will be first underlined in this respect. Then will be discussed under which conditions opinion polls could play a more significant role : periodical barometers constituting time series, international comparability, managing analysis potentialities at three levels : opinions (for short term forecasting), attitudes (for medium term trends), social values (for long term studies). A new way of research will also be indicated, about versatility of individual attitudes and behavior, a way which provides new vistas on linked societal phenomena.

"CONSEIL EN MANAGEMENT : UN OU PLUSIEURS SEGMENTS"

Jerome Barrand, CNAM, 2 rue Conte, 75003 Paris, France

D'apres une typologie du conseil en management etablie par SYNTEC, ce domaine se decompose en huit competences : strategie et politique d'entreprise, marketing production, ressources et structures humaines, systemes d'information et de gestion, technologie, finances et gestion, management de projet.

Ce decoupage, pour utile qu'il soit, ne doit pas faire oublier que les outils utilises pour resoudre les problemes correspondants, se recouvrent et sont plus complementaires que distincts.

Aussi les consultants doivent-ils multiplier les interactivites et proner la multidisciplinarite dans leurs interventions. Du meme coup, l'homme de conseil devient de plus en plus generaliste quand meme specialise dans la mise en oeuvre de certains outils.

Etant entendu que, pour etre efficace, la mise en oeuvre des outils passe de plus en plus par le "faire faire" plutot que par le "faire soi-meme", les rapports entre les consultants et l'entreprise doivent etre abordes de la maniere la plus serieuse qu'il soit.

""LE PROCESSUS DE PLANIFICATION STRATEGIQUE POUR LES PETITES ET MOYENNES ENTREPRISES"

D. Amar, Institut GAMMA, 3764 Cote des Neiges, Montreal, Quebec H3H 1V6, Canada

Sa presentation portera sur le processus de planification strategique qui s'adresse aux petites et moyennes entreprises; comment il differe de celui offert aux grandes entreprises. Trois intervenants : K. Valaskakis, Daniel Seni et David Amar.

FINANCIAL FORECASTING

Chair: Patrick McMahon, University of Birmingham, Dept. of Economics, PO Box 363, Birmingham B15 2TT, UK.

"AN ANALYSIS OF FINANCIAL ANALYSTS' EARNINGS FORECASTS"

David A. Bessler, Texas A&M University, Department of Agricultural Economics, College Station, Texas 77843, USA and John L. Kling, University of Virginia, McIntire School of Commerce, Charlottesville, Virginia, 22903, USA.

We plan an extensive study of financial analysts' earnings forecasts. Based on historical forecasts and actual performance, we will construct 'bootstrapped' forecasts which will be studied with respect to accuracy of the individual experts. Bootstrapping is the filtering of the systematic signal from the noise by regressing the actual variable to be forecasted on the expert's forecasts. Of particular interest will be the bootstrapped errors (that which is not explained). Additional evidence related to the individual company will be used to 'explain' such errors. Furthermore, the behavior of security prices subsequent to the dates of large errors will be studied.

"INFLATION ADJUSTED DEFLATED AND NON-DEFLATED ACCOUNTING EARNINGS : A TIME SERIES ANALYSIS"

Hossein Shalchi, Associate Professor of Accounting, The University of Michigan-Flint, Flint, Michigan 48502-2186, USA.

Recent years have witnessed an increasing interest in the investigation of the time series properties of accounting signals in general, and earnings in particular. The main reason for this emphasis evolves from the fact that time-series analysis of accounting earnings is not an end in itself, rather it is merely a means of identifying reliable forecasting models required for addressing various research issues in accounting and finance. There exists, however, no empirical evidence on the time-series behavior of constant dollar accounting (CDA) number. It is the objective of this paper to provide empirical evidence on the time-series properties of deflated and non-deflated CDA earnings series. The study utilizes an automatic algorithm for the ARIMA modeling process. Furthermore, the predictive ability of the firm-specific ARIMA models will be compared with naive models such as random walk and random walk with drift models. Several statistical tests such as Friedman two-way analysis of variance and Wilcoxon Matched-pairs Signed-Ranks tests will be used to test the null hypothesis of no difference in the study.

"ON THE APPROPRIATENESS OF APPLYING TIME-SERIES MODELS IN FORECASTING FIRMS' INCOME"

Essam Mahmoud, Management Science and Systems, The University of Michigan-Flint, Flint, MI 48502, USA.

Rsearch on time-series properties of firms' net income data has generated inconsistent and sometimes conflicting results. The main source of controversy has been attributed to the inclusion of extraordinary items in the net income calculations and the subjective decisions involved in the utilization of time-series models. This study will attempt to overcome these methodological issues. An automatic algorithm of the ARIMA models as well as other forecasting models are applied to various net income data to empirically determine the suitability of using different forecasting models for predicting future earnings.

LA VOLATILITE DU PRIX DES ACTIFS

Chair: Didier Marteau, Ecole Supérieure de Commerce de Rouen, France

"LA LIMITATION DE LA VOLATILITE DU PRIX DES ACTIFS"
Félix Debierre, Ingenieur des Ponts et Chaussees, France

Cette limitation (devises, taux d'intérêt, matières premières) est au coeur des modèles d'évaluation du prix des actions. La volatilité est même le seul élément indéterminé du prix des contrats conditionnels et le marché des actions peut être identifié à un marché de volatilités anticipées. La prévision de la volatilité est en conséquence au coeur des opérations de couverture et de spéculation.

"VOLATILITE DU PRIX DES ACTIFS : HISTORIQUE ET IMPLICITE"

David Pastel, Banque Indosuez, Paris, France

Deux types de volatilité sont à distinguer : la volatilité historique, calculée à partir d'une série statistique de prix d'actifs et la volatilité implicite, déduite d'un modèle théorique de pricing d'options appliqué aux données réelles du marché. La plupart des opérateurs anticipent aujourd'hui la volatilité future à partir de la volatilité historique, en se heurtant à deux problèmes statistiques non encore résolus le choix de l'horizon de la série de prix d'actifs sous-jacents, et celui du pas d'observation.

"VOLATILITE DU PRIX DES ACTIFS : EQUATION THEORIQUE DU PRIX DE L'OPTION"
Norman Mayns, Chief Economist, Drexel Burnham Lambert, Chicago, USA.

L'observation d'une série de volatilité implicite conduit le spécialiste à émettre des reserves sur l'identification de la volatilité anticipée par le marche à la volatilite implicite : les volatilités implicites d'options de même échéance, mais de prix d'exercices différents, sont par exemple souvent divergentes. La volatilité implicite agrège alors peut-être l'ensemble des éléments non intégrés dans l'équation théorique du prix de l'option.

"PRIX DES ACTIFS : ANTICIPATION DES OPERATEURS"
Alain Ruttiens, Banque Benelux, Rue des Colonies, 40, B - 1000 Bruxelles Belgique.

L'opérateur sur options doit-il prévoir la volatilité réelle du prix des actifs sous-jacents ou la volatilité implicite, reflet des anticipations du marché? Dans ce dernier cas, un modèle de prévision de la volatilité implicite doit reposer sur la connaissance du comportement d'anticipation des opérateurs. Un modèle de régression de la volatilité implicite sur la volatilité historique est alors nécessaire.

THE ROLE OF SCENARIOS IN FORECASTING

Chair: Charles Vlek, Instituut voor Experimentele Psychologie, der Rijksuniversiteit te Groningen, pa Biologisch Centrum, Vleugel D, Kerklaan 30, 9751 NN Haren (Gn.), The Netherlands.

During the Dutch national debate on future (nuclear) energy policy four macro-economic scenarios have been modelled. Each one sketched a particular 'energy future' up to the year 2000 in terms of immediate energy availability and use of energy sources, possible environmental consequences, and socio-economic actions and expected effects related to energy consumption. The scenarios were used during the debate (1983) both among experts and among the public at large. For practical use they were heavily condensed and represented like a multi-attribute utility option matrix.

Eighty subjects were given the four scenarios in a series of tasks aimed at assessing their wholistic preferences, the memorizability of the scenario information, both overall and attributewise probabilities of a scenario's realization, and a SMART-like assessment of multi attributed attractiveness. The paper will discuss the findings and their implications on forecasting with scenarios.

"SCENARIO'S AND STRATEGY"

W.P. Boerma, Krekel van der Woerd Wouterse BV, Weena 706, Postbus 20706, 3001 JA Rotterdam, The Netherlands.

Scenarios allow more uncertainty than traditional forecasting methods. As a consequence a scenarioset describes the uncertainty instead of providing a false sense of certainty. The scenariomethod is a forecasting technique in its own right. The difference from other forecasting methods is that it allows uncertainty to be expressed explicitly. Under what conditions is the scenariomethod preferable? This depends on the predictability of the elements involved. The predictability is determined by three characteristics: complexity, turbulence and the time-span. Each of these characteristics can make the elements unsuitable for all forecasting techniques except for the scenariomethod which allows for the both uncertainty of unpredictable elements and the more exact forecasts of other elements.

"SCENARIO APPROACH - A HOLISTIC VIEW OF FUTURE STUDIES IN STRATEGIC MANAGEMENT?"

Tarja Meristo, Turku School of Economics and Business Administration, Rehtorinpellontie 3, 20500 Turku, Finland.

Scenario is an alternative view of the future and its essential features are to be a holistic, hypothetical and possible description. Scenario approach (MSA) includes developing at least two alternative scenarios, describing what and where the company can be in these environments and formulating strategies based on this information. MSA can be seen as part of the strategic information system. The process developing scenarios produces information for strategic planning, decision-making and management. In this paper I try to combine these aspects of leadership to form a holistic view of the company coping with the future by using MSA. Some experiences in European countries in 1981-1985 are also reported.

LES PREVISIONS DE TRESORERIE DANS L'ENTREPRISE : PROCEDURES ALGORITHMES ET UTILITE

Chair: A. Chevalier, Professeur au Groupe E.S.C.P

"L'APPORT DE LA CONNAISSANCE DES FLUX DANS LA PREVISION DE TRESORERIE"
Eric Igonet, Directeur Financier ETYPHARM et Consultant d'Entreprises

Les flux de créances et dettes, de recettes et dépenses, conditionnent les flux d'encaissements, décaissements et soldes bruts qui sont l'information primordiale du pilotage de trésorerie.

Connaitre ces flux, leur évolution temporelle (tendance et saisonnalité), l'amplitude des aleas qui les affecte et les risques de retournement de tendance, permet de prévoir leur évolution future et le risque d'erreur qui s'y attache

"DATA ANALYSIS APPLIED TO SHORT TERM FINANCIAL MANAGEMENT"
Jean Abadie, Professeur a l'Universite de Chicago, Jacques d'Hoeraene, Président d'Acmeunion et Yves Ledoux, Directeur Général-Adjoint de la Compagnie Générale de Géophysique.

L'objectif de cet exposé est double: premièrement de montrer dans quelle mesure la cible du trésorier implique une démarche particulière d'analyse statistique; deuxièmement de décrire le genre d'informations accessibles, les buts de l'analyse et les moyens de la réaliser.

On présente donc successivement: la connexion, en deux étapes, entre l'objectif de gestion et l'analyse des données; le problème de taxonomie et le mode de résolution adopté; l'emploi des résultats de l'analyse.

"ELABORATION ET UTILISATION DES PREVISIONS DE TRESORERIE"
Benoît Bassy, Consultant Financier CEGOS.

Dans cet exposé sont décrites des démarches très pragmatiques et les instruments de prévision qui en résultent. Ceux-ci fournissent, tant que les risques d'erreur sont modérés, des prévisions d'une qualité qui permet des prises de décision (choix d'intruments de paiement, de mode de placement, de niveau de couverture de risque) conduisant à des coûts raisonnables de gestion de trésorerie.

"FORECASTING TECHNIQUES APPLIED TO SHORT TERM FINANCIAL MANAGEMENT"
Jean Abadie, Professeur a l'Universite de Chicago, Jacques d'Hoeraene, Président d'Acmeunion et Yves Ledoux, Directeur Général-Adjoint de la Compagnie Générale de Géophysique.

Le but est ici de présenter des méthodes de prévision spécialement conçues pour la gestion financière à court terme, allant du budget de trésorerie à la trésorerie quotidienne, lorsque les coûts d'erreur de prévision deviennent lourds.

On présente en conséquence les instruments de prévision permettant: la prévision extrapolative, la prévision causale et la combinaison de ces deux démarches; la prise en compte de la saisonnalité de la relation causale; l'emploi d'une méthode formalisée de scenarios; le contrôle de qualité et le choix de l'instrument approprié à la situation observée.

MATHEMATICAL MODEL BUILDING

Chair: Jan de Gooijer, Universiteit van Amsterdam, Faculteit der Economische, Wetenschappen, Jodenbreestraat 23, 1011 NH Amsterdam, Netherlands.

"SOLUTIONS OF SIMULTANEOUS EQUATIONS AND ITS APPLICATIONS TO FORECASTING AND MULTIPLIERS"

Hsih-chia Hsieh, Chung-hua Institute for Economic Research, 75 Chang-shing St, Tapei, Taiwan, R.O.C.

This paper evaluates the gradient method, quasi-Newton method, Poowell hybrid, etc. and improves an iterative algorithm under single equations and under systems of simultaneous equations. It improves the Gauss-Seidel algorithm through considering the first-order and higher order differential equations. The impacts of differences in magnitude among values of variables and the nonnegative constraints of the values of variables are also dealt with.

"A GENERALIZED SINGLE EQUATION ERROR CORRECTION MODEL AND ITS APPLICATION ON QUARTERLY DATA"

Erik Biørn and Hilde Olsen, Central Bureau of Statistics, Research Department, P.O. Box 8131 Dep. N-0033 OSLO 1, Norway.

In this paper, we specify a class of single equation 'error correction' models from a general autoregressive-distributed lag regression equation with one regressor and a white noise disturbance. This dynamic relationship is interpreted in terms of long run trends in the regressor and regressand and short run deviations from these trends. Proportionality between the variables is assumed in the long run. A parametrization which is useful for handling quarterly seasonally unadjusted data is proposed. The resulting model is estimated by means of a non-linear least squares algorithm. Empirical results based on Norwegian quarterly national accounts data - concerning the relationship between (i) household consumption and income, (ii) production and demand in manufacturing and (iii) capital accumulation and production in manufacturing - are presented. Some experiences from forecasting exercises are also reported.

"FORECASTING THE DAILY BALANCE OF THE DUTCH GIRO"

Aart F. de Vos, Vrije Universiteit, Postbus 7161, NL-1007, MC Amsterdam, Netherlands.

This paper describes a number of methodologically interesting aspects of a large model, developed to forecast the daily balance of the Giro (Postal Clearing Service). Several models are made to forecast one year ahead. The decomposition into several money flows is treated as well as the decomposition of each series into monthly aggregates and their distribution over the opening days. Some models for trends and seasonality are discussed, but the main focus is on models for calendar effects: one based on a transformation of the calendar, one on a Kalman-filter model. Comparison of both models concludes the paper.

Keywords: Calendar models, Trends and seasonality, Kalman-filter, model comparison.

"RECURSIVE ESTIMATION OF TIME DEPENDENT ADVERTISING TRACKING MODELS"

Colin F. Jex, Lecturer, University of Lancaster, Department of Operational Research, Gillow House, LA1 4YX, U.K.

'Discount Weighted Estimation', as developed by Professor Harrison is used to estimate models relating number of applications for new accounts with NGB (National Giro Bank) to TV advertising by NGB and competitors. The basic model is that of Broadbent but with the possibility of time varying parameters. Topics covered include how to detect and estimate change in the model parameters, comparison with ordinary regression models, and identification of events causing change. The conclusions of the study are that there is weak evidence for decay of effectiveness of advertising in the absence of competitor effects. Competitor's advertising can have a helpful effect in some circumstances, though it is usually highly competitive as one would expect.

MARKET SHARE FORECASTING

Chair: M. Stein, Director Transportation Research, Abt Associates Inc., 55 Wheeler Street, Cambridge, Mass 02138 USA and R. Brodie, University of Canterbury, Christchurch, New Zealand.

"A COMPARISON OF THE SHORT-TERM FORECASTING ACCURACY OF ECONOMETRIC AND NAIVE EXTRAPOLATION MODELS"

Roderick J. Brodie, University of Canterbury, Christchurch, New Zealand and Cornelis A. de Kluyver, University of Virginia, Charlottesville, VA 22903, USA.

Empirical evaluation of econometric market share models has shown that they are useful as descriptive tools. This use of the models has led to a number of generalizations about the effectiveness and relative importance of advertising, price, and other elements of the marketing mix. In contrast, little is known about whether these models are useful for prediction.

This paper examines the published empirical evidence about the predictive performance of econometric market share models and uses data for fifteen brands from three markets to examine the predictive ability of the models in more detail.

Three conclusions are reached:

1. Econometric market share models were not consistently more accurate than simple extrapolation (time series) methods for short-term forecasting.
2. Market share models did not usually capture enough of the important features of the market to be used by themselves as "stand alone" forecasting instruments.
3. Apart from differences between markets there did not appear to be circumstances which indicated where econometric market share models are likely to be more accurate at short-term forecasting. Surprisingly the face validity of the estimated models did not appear to be a good indicator of forecasting accuracy.

The final section of the paper poses a number of research questions which need to be resolved before any final judgment can be made about the usefulness of econometric models for prediction.

"PREDICTING NONSTATIONARY MARKET DEMAND USING SYMBOLIC NETWORK MODELS"

William C. Cave, Prediction Systems, Inc, 200 Atlantic Avenue, PO Box 276, Manasquan, NJ 08736 USA.

This paper addresses the general problem of improving prediction accuracy in market demand characterized by nonstationary and nonlinear behavior. Solutions to the basic problems of forecasting are proposed. A framework is developed wherein conceptual and structural knowledge of market mechanics can be incorporated into the model construction. Within this framework, models are developed using symbolic networks whereby modelers can really express their knowledge of market mechanics, incorporate information not found in data, and thus gain prediction accuracy. Computer aided graphical tools for constructing symbolic network models are described, along with examples of market demand prediction models developed using this approach.

"MARKET SHARE FORECASTING IN THE TRANSPORTATION INDUSTRY"

Marianne Beauregard and Martin Stein, Abt Associates Inc. 55 Wheeler Street, Cambridge, Massachusetts 02138, USA and Wolfgang Millin, Marketing Research Manager, Lufthansa German Airlines, 2-6 Von-Gablenz-Str., D-5000 Cologne 1, Federal Republic of Germany.

The authors view automotive and airline industry market share forecasting approaches designed under varying sponsorship to develop an overall conceptual framework for conducting market share forecasts in the transportation industry. Since transportation is a derived demand, there is substantial volatility that needs to be accounted for by the use of multivariate time series modeling techniques.

Automotive industry market share analysis relates to a demand for a durable good - the automobile - which is used to provide transportation service. In contrast, airline market share estimation examines directly the demand for a service - air travel - and is origin-destination-specific. In spite of these differences, many of the same socioeconomic and life style factors may be used to forecast market shares in the respective modes.

"A COMPETITIVENESS MODEL TO FORECAST MARKET SHARES"

Muhittin Oral, Sciences de l'Administration, Universite Laval, Ste-Foy, Quebec, PQ, G1K 7P4, Canada.

The market share attraction models discussed in the literature tend to formulate the market share of a given firm as a function of the 'attractiveness" of all the firms that are active in the market of interest. The term 'attractiveness' however lacks an operational definition that may be of practical use in estimating the market share of a firm. This paper proposes an industrial competitiveness model, which is based on the comparative advantages and disadvantages of the firms with respect to system efficiency and cost effectivenss, as a tool of forecasting market shares of the firms in given domestic and international markets.

INTEGRATING FORECASTING WITH DECISION-MAKING

Chair: Annelle Eerola, Edp and Systems Specialist, Market Research Dept., Jakko Poyry Consulting Oy, Kaupintine 3, PO Box 16, 00401, Helsinki 40, Finland.

"JUDGMENTAL FORECASTING AND DECISION MAKING WITHIN AN ORGANIZATION"

J.M. Bourdaire, Total - CFP Operational Research Division, TOTAL, 76781 Paris, France.

"Betting", "Subjective probability", "judgmental forecasting", "risk assessment",, "decision making under uncertainty"... are synonymous. However these concepts are individual as they normally apply to a single person. How to extend them to an organization?

Our experience in an International Oil Company indicates that the way decisions are made depends on the very nature of the matter:

- tactical, i.e. everyday and expert decisions will use explicit subjective probabilities with a methodology based on the log-normal distribution and on calibrations which fit our basic behavior patterns.
- strategic, i.e. managerial and rare decisions will focus on the consistency of a few scenarios, and will keep away from explicit probabilization as a way to enhance consensus.

"TASK AND INDIVIDUAL INFLUENCES ON JUDGMENTAL FORECASTING"

George Wright and Peter Ayton, Decision Analysis Group, City of London Polytechnic, Old Castle Street, London EI 7NT, UK.

This talk assesses the effect of the desirability, perceived controlability, time duration and time horizon of a judgmental forecast on assessed subjective probabilities. In addition we evaluate the evidence for stable individual differences in judgmental forecasting ability across a range of situational manipulations. Finally, we describe the use of a computer-based aid to judgmental forecasting.

"FORECASTING FOR POLICY-MAKING: A SELF-REFERENTIAL SYSTEM"

Atle Midttun, Norwegian School of Management, P.O. Box 69, N-1341 Bekkestua, Norway and Thomas Baumgartner, Research Consultants, Schiedhaldenstr. 6, CH-8700 Kusnacht-Zurich, Switzerland.

Models and forecasts provide information about possible future system states to decision-makers (and the public at large as well). The decision-makers act within and influence, possibly even try to control, the system that is modelled. Modellers, models and forecasts, on the one hand, the modelled and forecasted system, its decision-makers, and other interested

"by-standers", on the other hand, together form a self-referential and self-reactive system. Model and forecasts "explain" an otherwise "unknowable" system. Actors react to the forecasts, changing thereby the system. This leads to a particular self-dynamics revealed by an inquiry into energy modelling and forecasting developments in the last 20 years in eight OECD countries:

the use of predictive forecasting (often used to legitimate desirable policies) has undermined the image of the objective modeller, models and forecasts.
resultant forecasting failures and modelling conflicts have encouraged the development of normative modelling methodologies (scenario analysis, backcasting) that raise problems of quality control and verification.
modelling and forecasting have become elements in the "scientific negotiation of the future". They are elements of politics and have to be evaluated according to the political standards of interest representation and democratic access to modelling and forecasting capacities.

"COMBINING JUDGEMENTAL AND QUANTITATIVE FORECASTS"

Joel Fingerman, Department of Management, Roosevelt University, 430 South Michigan Avenue, Chicago, Illinois 60605, USA.

Forecasters who are developing quantitative models often work with others who have informed, subjective judgement about the quantities being forecast. There may be useful judgemental information about the specific variables being forecast, or there may be valuable subjective information about the explanatory variables being used in a forecasting model.

It is to the forecaster's advantage if the judgemental forecasts can be incorporated into the quantitative model. Thus, it is the intent of this paper to present methods and and examples of the incorporation of subjective judgement in econometric and time series forecasting models.

BYPASS ANALYSIS IN TELECOMMUNICATIONS

Chair: C. Buxton, Pacific Bell, USA

"A PROCESS FOR FORECASTING INTERLATA ACCESS DEMAND"
David L. Fane, Bell Communications Research, Inc., Room 1B-101, 290 West Mt. Pleasant Ave., Livingston, New Jersey 07039, USA.

The objectives of this presentation are to describe the techniques and procedures that compose the InterLATA access forecasting (IAF) process; to describe tools developed to facilitate this process; and to discuss the issues related to implementing the IAF process.

One tool that is available to the forecaster is MAUD, the Model of Access and Usage Demand. The model provides a flexible framework for determining how the subscriber's total demand, which is assumed to be stable, can be mapped into a set of specific service offerings. MAUD accomplishes this by assuming that subscriber's are indifferent, except for price, to services and, therefore, they will choose the mix of services that provides the required service and minimizes their total telecommunications bill. The last part of my presentation discusses the MAUD framework and explains how this model can be used in the IAF process.

"POP PROLIFERATION : A CASE OF ECONOMIC BYPASS?"
Mark Ferris and Peter Grandstaff, Southwestern Bell Telephone and Shuh Chow, Bellcore, USA.

Interexchange carrier (IC) access charge bills are related to the number and location of their points of presence (POP). To lower distance sensitive charges, AT&T has asked Southwestern Bell Telephone (SWBT) to allow it to establish POPs on SWBT premises, trading a higher switched cost for a lower special cost. If SWBT does not comply, AT&T has threatened to build new facility POPs. The Hot Wire Center model was developed jointly be SWBT and Bellcore to assess the revenue implications for the Local Exchange Carrier (LEC) by means of competitive analysis. The model evaluates the costs and benefits to an IC of establishing new POPs using a net present value (NPV) approach. Each end office is evaluated as a potential POP location. If the NPV for that particular project is positive then the revenue decline associated with distance sensitive access charges is considered at risk. Both switched and special quantities are evaluated. The model has been used to both quantify the problem and to evaluate solutions. The research has been used to justify new local transport rates that reduces revenuevulnerability. The importance of distance and volume for rate marking is clarified. A proposal for local transport price setting is made.

BYPASS OF THE PUBLIC SWITCHED NETWORK: THEORETICAL AND EMPIRICAL ANALYSIS"
Neal C. Stolleman, GTE Service Corporation, USA.

The crucial issue facing exchange carriers in the rapidly changing telecommunications environment is the prospective demand for their switched access facilities on the part of long distance carriers and end users with large amounts of toll volume. The reasons for the increased importance and focus on the segment of the network that produces access include: 1) the

divestiture of the Bell system, 2) distortions in the price structure for access and substitute facilities due to delays in CALC implementation, 3) evolution of new, lower cost technologies, 4) increased propensity for customer concentration on the part of telecommunications wholesalers, e.g. real estate developers and ATTIS.

The concern that LECs have is that the demand for their switched facilities in the provision of exchange access will be significantly reduced because of the operation of the factors cited above. Because of the separation of AT&T from its operating companies, the set of potential customers vulnerable to bypass has been increased. Thus, a way of estimating demand needs to be found.

"BYPASS ADOPTION RATE STUDY"

Dennis L. Weisman, Southwestern Bell Telephone, USA.

A number of studies have investigated the Local Exchange Carriers (LECs) vulnerability to bypass of the public switched network. These studies conclude that significant economic incentives exist for customers to engage in bypass. The time path over which bypass is likely to occur, however, has been largely ignored. In fact, the FCC noted in its Bypass Order released on January 18, 1985, that with regard to "the timing of bypass activity, relatively little solid data was presented" (CC Docket 78-72, phase 1, p.24). The problem with forecasting the rate of bypass adoption is that most of the economic incentives propagating bypass are relatively new and tracking data is quite limited.

The Bypass Adoption Rate Study (BARS) attempts to remedy the deficiency with regard to the timing of bypass adoption by establishing a relationship between bypass adoption and OCC market penetration. Sepcifically, the study maintains the hypothesis that bypass is simply discounted toll service. Hence, it is possible to analyze AT&T's loss of marketshare to competing OCCs over time and infer a similar market response with regard to bypass. That is to say, if AT&T market share erosion can be explained principally by the difference between AT&T and OCC toll rates, it should be possible to explain bypass adoption by the difference between what customers pay for switched access and what they would pay for bypass.

Utilizing the approach [illegible]sed above, a model is developed that can be used to simula[illegible]e alternat[illegible]cess charge rate designs and their resultant impact on byp[illegible]ss adopti[illegible] The evidence presented in this study clearly attests to the [illegible]eed to mov[illegible]ost-based pricing of LEC services as rapidly as possible. Failing th[illegible]cts are questionable for maintaining universal servi[illegible]e while re[illegible]omised benefits of competition.

TEACHING IN FORECASTING

Chair: A. Schleifer, Professor of Business Administration, Graduate School of Business Administration, Havard University, Soldiers Field, Boston, Mass. 02163, USA.

"EXPERIENTIAL LEARNING IN FORECASTING"

J. Scott Armstrong, Wharton School, University of Pennsylvania, Philadelphia, PA 19104, USA.

Many aspects of forecasting are counter-intuitive. In such situations, experiential exercises are expected to be more effective than traditional methods of instruction. This paper describes experiential learning and the conditions under which it is expected to be most effective. The discussion relies on previously published theory and research on how people learn. A sample exercise is then presented along with results from classroom use.

"TEACHING TIME-SERIES ANALYSIS"

Dr. Chris Chatfield, Reader in Statistics, University of Bath, UK

Statistics students often/usually learn forecasting as part of a general course on time-series analysis. The contents of such a course are briefly reviewed. Some possible advantages and disadvantages are briefly discussed, such as a possible over-emphasis on Box-Jenkins methods. The use of MINITAB, or some similar package, is recommended as a teaching aid.

"THE IMPORTANCE OF FORECASTING FOR MANAGERS MANAGEMENT DEVELOPMENT APPROACHES"

Dr. Robert Fildes, Manchester Business School, Booth Street West, Manchester M15 6PB, England

Manchester Business School carries out a wide range of teaching programs, some designed for general management, some aimed at high-flying technologists, and some short courses aimed at senior executives close to board level. Despite the importance of forecasting in underpinning much of the rest of the curricula in such subjects as strategy, corporate and financial planning, and marketing, little time is available to discuss the core ideas of forecasting, in particular where a manager might look for improvement in current organisation practice. This talk will discuss the key ideas that in the speaker's experience have proved effective in demonstrating the importance of forecasting to non-specialist managers.

In contrast, forecasting forms the core of the course delivered to technologists. Here the aim is to alert the participants to the wide range of alternative futures that their organisations may be operating in long term. The speaker will describe how the ideas and uncertainty of long term forecasting have been taught through the use of a the lengthy project.

"TEACHING FORECASTING THROUGH A COMPUTER AND A PROJECTION SCREEN"

Spyros Makridakis, Research Professor, INSEAD, France

Computers offer immense possibilities for improving the teaching of forecasting. In addition to performing the tedious computations involved, computers permit us to work with real data, get and compare the forecasts from different methods, plot data and predictions, make adjustments and a host of other forecasting related tasks. This presentation will discuss how the computer has been used in a statistics and forecasting course both during class (through a projection screen in live sessions) and after class at the individual pace of the students.

FORECASTING IN EUROPE

Chair: Silvia Biffignandi, Istituto di Matematicae Statistica, Via Salvacchio 119, 24100 Bergamo, Italy.

"TESTING FOR CAUSALITY : A COMPARATIVE CASE STUDY FOR THE AUSTRIAN AND SWISS MONETARY BASE"

Gerhard Thury, Osterreichisches Institut fur Wirtschaftsforschung, Postfach 91, A. Wien 1103, Austria.

The monetary base is defined as the liquid liabilities of the central bank in a certain country. In small open economies with rigid exchange rates like Austria and Switzerland, a pronounced negative relationship can frequently be observed between the foreign and the domestic components of the monetary base. This phenomenon may be explained by either of two hypothesis: the "capital mobility hypothesis" or the "sterilization hypothesis".

The capital mobility hypothesis implies unidirectional causality running from the domestic to the foreign component of the monetary base. It rests on the assumption of complete substitutability between domestic and foreign financial capital at the world market interest rate which, for a small open economy, is exogenously given. Deviations of the home interest rates from the world market rate will induce equilibrating capital flows.

According to the sterilization hypothesis, a negative correlation between the foreign and the domestic component exists from attempts of the central bank to neutralize exogenous shocks from abroad. By pursuing some monetary target, any balance of payments disturbance endangering monetary stability at home will be compensated by discretionary adjustments in the domestic component. In case of successful sterilization, unidirectional causuality running from the foreign to the domestic component is observed.

The direction of causality between the foreign and the domestic components of the monetary base can therefore be used as a criterion to discriminate between these two competing hypothesis explaining the observed negative correlation between foreign and domestic component. We apply the conceptual framework suggested in Geweke to determine this direction of causality for Austria and Switzerland. For each country, we have weekly observations of the foreign and the domestic components of the monetary base between 1973 and 1984. In the first stage of the analysis, we compute the Geweke measures of linear dependence for the period 1975 to 1984. In the second stage the data is divided into two subsamples: one covering the period from January 1973 to June 1979 and the other the period from July 1979 to December 1984 in order to test for structural changes.

"SCENARIOS FOR NORWAY - YEAR 2000"

Terje Osmundsen, Project Director, Ambassade de Norvege, 28 rue Bayard, Paris 75008, France.

The project "Scenarios for Norway - year 2000" will be starting in August 1986, and is a first attempt to launch a qualitative and scenario based approach to long-term analysis and strategic policy planning in Norway. The study will be organised as an independent research unit at the Norwegian School of Management in Oslo, but will be carried out in a close dialogue

with the Shell group and policy makers in the public and private sector that are also financing the project.

The analysis, the making of scenarios and eventually reconstructing models will be carried out by 7-8 researchers with mixed experience and professional background: Their experience ranges from social science research, consultancy, government, private business and public planning. In addition to cooperate with the national bodies, it is also the intention to make international contacts and cooperation will also be a distinctive feature of the project.

"STRATEGIC PLANNING AND ITS FORECASTING FOUNDATION IN THE HUNGARIAN INDUSTRY"

Dr. Magdolna Csath, National Management Development Centre, H- 1476, Budapest VIII, Hungary

1 Strategic planning practice in the Hungarian industry: time horizon of strategies, differences in relation to the branches of industry, process of strategic planning, methods.
Specialities of strategic planning in state-owned enterprises: relationship among national planning, industrial policy and corporate strategic planning.

3 Conditions of strategic planning:
: autonomy in decision-making, in forming, shaping the future of the enterprise,
: future-orientation: continuous, future-oriented environmental scanning, aspiration to look ahead and not backwards to meet the challenges of the future instead of being proud of the past results,
: management culture: shared values and goals, healthy communication system, good internal climate

4. Future-orientation and implementing strategic change: the role of the corporate councils in strategic decision-making.

5. The problems and chances of forecasting in the practice: methodological, environmental and human approach of future-orientation in the strategic planning process.

"MODELISATION OF THE SPANISH TELECOMMUNICATIONS SECTOR"

Diego Bader, Adolfo Castilla, Timoteo Martinez, Fundesco, Castellana 83-85 6.a, 28046, Madrid, Spain.

Telecommunications are supposed to provide the basic infrastructure needed for what is often called "The Information Age", and thereby to absorb important amounts of (scarce) resources in the near future. As this sector is very capital intensive, the decision of governments in order to favor investments in telecommunications at a time characterized by high unemployment rates becomes difficult: everybody seems to agree on the positive long range results of investing in high technology, but the quantification of the indirect effects brought about by productivity gains due to an improved telecommunications network cannot be easily evaluated. The paper presents an initial version of an econometric model of the Spanish telecommunications sector, built as a tool for clarifying some aspects in that concern.

FORECASTING IN FINANCE

Chair: Jeffrey Fisher, Bank of Israel, Economics Dept., PO Box Jerusalem 91007, Israel

"A BOX-JENKINS FORECASTING MODEL OF DAILY EXCHANGE RATES"

Andre Keller, University of Paris II and CNRS - France and Bernadette Marechal, University of Besancon and IME (CNRS) - France.

To build a Box-Jenkins forecasting model of daily exchange rates involves obvious methodological and practical issues. From the methodological point of view, the available data basis containing about 2600 observations, allows for alternative approaches and studying the specification of the model and the aggregation levels of the time series. As to the practical aspects, daily forecasts may be very helpful in international portfolios management problems. Moreover these results may be compared to other available forecasts on exchange rates at various aggregation levels. These models are applied to the daily parities of the Deutsche Mark and of the US-Dollar vis-a-vis the French Franc over the period 1975-1985.

"FORECASTING STOCK VALUATION"

John P. Carter, Professor of Business Administration, Emeritus, University of California, Berkeley and Luther Nieh, Professional Engineer.

A computer model makes operational J. B. Williams' theory: equity investment value equals present value of stream of future dividends varying in perpetuity. Alternative yields vary daily. Present value quantification requires heroic simplification.

Inputs forecast individual companies' earnings four years hence. Investors unable to generate own forecasts may purchase. One source: VALUE LINE with standardized economic conditions and confidence measure. Another: Zack's.

Program generates present value of future prices plus dividend stream, compares with current market price plus transactions costs.

In efficient markets, ratio of value to cost should approximate unity. Main market players are institutional and tax free. With differing marginal tax rates and capital gains treatment, individual investors may find value/cost ratios depart from unity.

"FORECASTING CASH OUTFLOWS: A STRUCTURAL EQUATION AND MEASUREMENT THEORY APPROACH"

Professor Rebecca Todd and Professor Paul Foote, New York University
40 West 4th Street New York, NY 10013, USA.

This study reports on a comparative evaluation of two forecasting techniques for future cash flows resulting from investments: (1) the use of a "cash flow" aggregate in a univariate time series mode; and (2) the development of a linear structural (LISREL) model of the cash flow generation process incorporating latent variables, measures of the latent variables, and the disaggregated cash outflows to be predicted. The structural model permits complex interrelationships among cash flow dimensions to be explicitly

modelled, reliability of measures and constructs to be assessed, and "noise" from episodic variables to be purged from the forecast.

"STATE SPACE MODELLING OF CASH FLOWS AND ACCOUNTING EARNINGS"

Celal Aksu, Department of Accounting, School of Management, Syracuse University, Syracuse, New York 13244, USA

This study attempts 1) to determine the nature of the firm's cash flow generating process, and 2) to evaluate the usefulness of the firm's accrual-based earnings in assessing its future cash flows. The underlying cash flow generating process is determined by analyzing the statistical properties of the cash flow data. The usefulness of earnings in assessing future cash flows is evaluated by comparing the predictive ability of univariate models (cash flows) against those of the bivariate models (cash flows and earnings) for each firm in the sample. State space method is used to drive the firm-specific univariate and bivariate models.

ANALYSE DES STRATEGIES D'ACTEURS II

Président : Thomas Durand, Professeur à l'Ecole Centrale de Paris,
92295 Chatenay-Malabry Cedex, France.

"L'ENTREPRISE CONFRONTEE A DES RUPTURES TECHNOLOGIQUES : DES EXEMPLES DE COMPORTEMENT STRATEGIQUE"

Thomas Durand, Professeur à l'Ecole Centrale de Paris,
92295 Chatenay-Malabry Cedex, France.

Les ruptures technologiques remettent en cause les positions acquises, rendent obsolètes les savoir faire anciens, fluidifient la dynamique concurrentielle d'un secteur. Quelles stratégies les firmes doivent-elles élaborer et mettre en oeuvre pour tirer profit des bouleversements industriels que génèrent les technologies innovantes ? Au-delà des modèles de diffusion de l'innovation existants, peut-on tirer des enseignements de l'histoire des secteurs où des ruptures technologiques ont transformé le jeu concurrentiel ? Cet article présente deux exemples précis relatant l'évolution historique de la technologie dans les domaines de la commutation téléphonique et de l'insuline. Au-delà sont décrites les stratégies des firmes présentes dans ces activités et confrontées à de véritables révolutions technologiques. En particulier sont analysées les conséquences de ces stratégies sur leur position concurrentielle. Pour tenter d'expliquer la logique d'évolution des situations évoquées et pour illustrer les enseignements tirés transversalement d'un nombre plus large d'études semblables, est présenté en conclusion un modèle définissant des stratégies génériques pour l'entreprise confrontée à de telles ruptures technologiques.

"LES STRATEGIES DE VALORISATION TECHNOLOGIQUE DES ENTREPRISES"

Marc Giget, Directeur d'EUROCONSULT, France.

Les importantes mutations technologiques et les incertitudes qui en résultent affectent considérablement les éléments déterminants des stratégies des entreprises jusqu'alors principalement fondées sur une logique financière et de produits/marchés.

Face à cette incertitude, les stratégies de valorisation technologique permettent le maintien d'un rythme élevé de croissance par la minimisation des coûts de développement de nouveaux produits et des risques liés aux fluctuations sectorielles de la demande.

Une formalisation du concept de stratégie de valorisation technologique est proposée à partir de l'analyse du développement de ce type de stratégie au sein des grandes entreprises au début des années 80 aux Etats-Unis et surtout au Japon. Dans ce pays, cette mutation entraîne une redéfinition de la fonction même de l'entreprise, articulée autour de l'intégration de technologies génériques et de leur valorisation dans différentes lignes de produits/marchés.

"LE MARCHE PETROLIER : UNE ANALYSE DYNAMIQUE DE COMPORTEMENT"

Michel KARSKY, CNRS - DCRI
15 Quai Anatole France,
75007 Paris, France.

On présentera certaines dynamiques et évolutions du marché pétrolier mondial, à partir d'un modèle basé sur la prise en compte des influences et des interactions entre différents facteurs de comportement des acteurs de ce marché. Analysant les variations respectives de facteurs aussi divers que stockages, achats spéculatifs, variations volontaires ou obligées de production, anticipations, etc..., on montrera l'interdépendance des dynamiques rapides et lentes de ce marché, ses tendances les plus fortes, ainsi que quelques contradictions entre conséquences immédiates et à long terme de certaines actions.

"STRATEGIES TECHNOLOGIQUES ET EVALUATION DE LA RECHERCHE BIOTECHNOLOGIQUE EN FRANCE ET AU JAPON"

Nicolas Danila, Professeur Conseiller à l'Institut de Management Public, France.

Parmi les nouvelles technologies, les biotechnologies ont été évaluées, aussi bien en France qu'au Japon, comme des industries particulièrement prometteuses et constituant donc des domaines prioritaires de développement dans les années à venir.

Une comparaison des stratégies technologiques suivies et de la gestion et de l'évaluation de la recherche biotechnologique pratiquées doit, en principe, bien traduire les approches pratiquées pour promouvoir les nouvelles technologies par ces deux pays.

Pour réaliser cette comparaison, une étude approfondie et empirique a été utilisée dans les deux pays, principalement sur deux secteurs industriels : agro-alimentaire et pharmaceutique.

Cette présentation sera focalisée d'une part, sur le secteur pharmaceutique et, d'autre part, sur l'évaluation et la sélection des projets de recherche pharmaceutique dans les deux pays.

Les analogies sont d'abord présentées, suivies par les différences d'approches et l'incidence sur les stratégies technologiques que ces différences impliquent. Une description des triangles d'or de la stratégie et de la planification stratégique (MONO, HITO, KANE), utilisées au Jappon permettra de mieux comprendre l'intégration de l'évaluation et la sélection des projets de recherche dans les stratégies technologiques dans les deux pays.

"L'APPROCHE PROFIL DE RISQUE OU UNE METHODE POUR INTEGRER LA PROSPECTIVE DANS UNE DEMARCHE STRATEGIQUE"

Michel Siat, Vice-Président du Groupe MAC, Directeur du Bureau de Paris, France.

L'objectif de cette démarche appelée "Profil de Risque" est d'aider les dirigeants de grands groupes à apprécier l'intérêt et les risques associés des alternatives stratégiques qui s'offrent à eux. Par exemple :

- comment réallouer le budget Exploration Production d'un groupe pétrolier?

- Faut-il ou non créer (ou fermer) une usine pour un fabricant de matériels?

- Comment repenser sa stratégie de distribution pour un groupe automobile?

L'intérêt de cette approche est double :

- Par l'utilisation de scénarios contrastés et opérationnels sur l'environnement futur de l'entreprise, elle permet d'intégrer la démarche prospective dans le processus stratégique.

- En plus d'être une méthode d'aide à la décision, elle est un outil de processus. Elle permet à chacun - opérationnel ou fonctionnel - de comprendre les enjeux et d'apporter sa contribution, et ainsi de faciliter son adhésion aux choix effectués par la Direction Générale.

L'approche se déroule en trois phases :

- La définition du cadre d'analyse, grâce à l'identification des variables clés pour le problème posé et la définition en parallèle de la stratégie envisagée et de quelques scénarios sur l'environnement futur de l'entreprise. L'identification et la répartition des variables clés en variables stratégiques et en variables de scénarios se fait grâce à une grille permettant de mettre en évidence les opportunités et les vulnérabilités de l'entreprise par rapport au problème posé.

- L'évaluation en termes financiers (et si nécessaire par rapport à d'autres critères comme l'emploi) de la stratégie actuelle par rapport à chacun des scénarios sur l'environnement futur de l'entreprise. Cette évaluation permet d'apprécier la valeur de la stratégie actuelle de même que son niveau de risque par rapport aux objectifs fixés. Dans le cas où l'analyse est effectuée pour une société côtée en bourse, ces résultats peuvent être comparés à la valeur du marché de la société.

- La discussion des résultats précédents et la recherche des améliorations possibles, soit en accroissant la valeur moyenne de la stratégie envisagée, soit en réduisant son niveau de risque.

En résumé, l'approche "Profil de Risque" est à la fois un outil et un langage pour intégrer les dimensions prospectives et statégiques dans le processus d'adaptation des entreprises et de recherche de la meilleure compétitivité.

FORECASTING MODELS FOR THE OIL INDUSTRY

Chair : Denis Babusiaux, Direction des Etudes du CES d'Economie Petrolière, E.N.S.P.M., Institut Français du Pétrole.

"DRI EUROPEAN OIL SPOT MARKET MODEL"

Dr. Silvia Pariente-David and Dr. Antoine Elzir, DRI European Energy Services, 13 rue du 4 Septembre, 75002 Paris.

The DRI European Oil Spot Market Model is used to prepare forecasts of spot crude prices (15 crudes) and spot product prices (naphtha, gasoline, gasoil, jet kerosene, heavy fuel oil) for the next six months. The frequency of the model is weekly. The forecast is updated every week by incorporating new Platt's price assessments. The basic principle of the model is to explain the ratio of spot crude prices to official contract prices in terms of world oil demand and supply and the ratio of spot product prices to the average spot crude price in terms of local considerations of demand and supply for the particular product. Alternative scenarios are obtained by varying assumptions on crude oil production, oil consumption or stock changes.

"ECONOMIC AND ENERGY LONG-TERM FORECASTS FOR MARKET-ECONOMY DEVELOPING COUNTRIES PREDESS MODEL"

Bertrand Lépinoy, Compagnie Française des Pétroles TOTAL, Direction Economie.

The originality of the methodology can be summed up as follows: The economy of the developing countries is analyzed by region and sector, according to a mechanism of productive accumulation, by integrating the dissymmetry of the international economy and the traditional role of locomotive played by the industrialized countries. This world economic model is prolonged by an energy model, which is also regional and sectorial, highlighting way both commercial and traditional energy sources have been developed as well as the multiple facets of energy substitution. The model pays special attention to the tremendous problem of traditional energy sources, in which deforestation is the best-known aspect, and it analyzes the possibilities and consequences of this transfer of energy requirements to commercial energy sources.

The model in question is currently being officially used at the Institut Français du Pétrole and Compagnie Française des Pétroles.

"PREVISION A COURT TERME DES VENTES MENSUELLES DE PRODUITS PETROLIERS"

Yann Gasnier, Compagnie Française des Pétroles TOTAL, T.A.R.D.C. France.

Cette étude de cas, synthèse de travaux effectués à ELF-FRANCE, fournit un élément de réponse aux difficultés de la fonction prévision en entreprise.

Le choix de la méthodologie de BOX et JENKINS pour la prévision des ventes mensuelles de produits pétroliers résulte d'une évaluation des techniques disponibles, basée sur le recensement des problèmes typiques rencontrés. L'application pratique est menée à son terme en intégrant des améliorations de complexité croissante - notamment pour la prise en compte de l'environnment : interventions et fonctions de transfert - en analysant l'évolution du système prévisionnel, enfin en évaluant les améliorations possibles de la méthode pour apprécier globalement son intérêt.

ECONOMIC FORECASTING

Chair: Jean-Pierre Marciano, Faculté d'Economie Appliqué, Université d'Economie d'Aix, Marseille, 3 Avenue Robert Schuman, 13100 Aix en Provence, France.

"L'ECONOMIE INFORMATIONNEE : UN ELEMENT DANS LA REFLEXION PROSPECTIVE"

Monsieur Victor Sandoval, Chargé de Mission, Observatoire Economique et Statistique de Transports, 55/557 Rue Brillat Savarin, 75013 Paris, France.

Ce papier essai de formuler une prospective dans le cadre d'une économie informationnee. Ici l'emploi et la production d'information sont les éléments les plus importants de la société. Cette conception est appliquée à la France et à d'autres pays de l'OCDE. Elle se differentie des conceptions américaines les plus connues par sa prospectivité, par une nouvelle distinction des étapes de la croissance et par une nouvelle combinaison de la théorie de secteurs économiques. Lorsque l'information domine la vie économique and sociale, aucune prévision ne peut l'ignorer et les conséquences qui en découlent.

Sommaire: 1) Critique des theories de l'économie de l'information, de la croissance et des secteurs économiques

2) Transformation des économies développées en économies informationnées: le cas de la France

3) Les enjeux pour l'emploi et la production

4) L'économie informationnée comme étape universelle de l'humanité

5) Les enjeux internationaux de l'économie informationnée

6) Répenser l'avenir: vers une nouvelle croissance

"INTERINDUSTRY AND AGGREGATIVE FORECASTS: A SYNTHESIZING APPROACH"

Dr. Vladimir Simunek, Professor of Economics, Department of Economics and Finance, St. John's University, Grand Central and Utopia Parkways, Jamaica, New York, 11439, USA.

This paper discusses the methodology of macroeconomic forecasts based on a macroeconomic model that contains three components: the Leontief's interindustry system, the Keynesian aggregative system, and the system that simulates macroeconomic markets. In the model all three systems are interactive and produce forecast data of outputs, purchases-sales, consumption and inventories changes in producing and consuming industries, and data on components of final consumption. Data are generated in constant dollars, current dollars, and as price deflators. The forecasting model is a large-scale model of the U.S. economy. It contains 43,935 variables.

"FORECASTING AGGREGATE DEMAND COMPONENTS WITH OPINIONS SURVEYS IN THE FOUR MAIN EC-COUNTRIES - EXPERIENCE WITH THE BUSY MODEL"

Michel Biart and Professor Praet, Commission des Communautés Européennes, Direction Générale des Affaires Economiques et Financières, 200 rue de la Loi, B - 1049, Bruxelles, Belgium.

The paper presents a quarterly model of aggregate demand components for France, Germany, Italy and the United Kingdom, to be used in very short term

forecasting. The originality of the model is that it makes extensive use of qualitative data obtained through tendency surveys carried out for the Commission of the European Communities among enterprises and households.

The very short term forecasting optic implies that the model must be as compact as possible both in terms of data requirements and computation as it is to be used regularly by the Commission of the European Communities.

The paper is organized as follows: description of the general structure of the model; presentation of regression results and discussion of forecasting performances.

"PRODUCTION FORECASTING: THE USE OF CONTROL CHARTS"

Michel J. Cleary, Ph.D, Professor of Management Science, Wright State University, Dayton, Ohio 45435, USA.

Control Charts (x-bar and R, P, C, and U) were originally developed by Dr. Shewhart over 50 years ago. Their purpose is to forecast the behavior of a process. Although they were applied with some success during World War II in the Western World, their application died out soon after the war. They were taken to Japan by Dr. W. Edwards Deming in 1950, and were applied there with great success.

This paper deals with the broad issue of how these forecasting techniques have recently been applied in the United States. It will also focus on the process of selecting proper sample size for the greatest efficiency from these charts. A computer simulation will be used in the investigation.

LE RISQUE - PAYS : RISQUE FINANCIER

Président: René Pinçon, Etudes Economiques, Société Generale, Paris, France.

"LE CARACTERE PERFORMANT ET ADAPTABLE DES REECHELONNEMENTS"
Richard Brun, Responsable des Risques-Pays de la Banque de France.

La crise financière a mis à jour une adaptabilité et une responsabilité des créanciers internationaux qui n'étaient jamais apparues auparavant. Ce changement de comportement se maintient alors que la crise a fortement perdu de son intensité, ce qui permet d'envisager l'avenir avec un relatif optimisme.

"L'APPROCHE DU RISQUE-PAYS DANS UNE BANQUE COMMERCIALE"
Denis Kleiber, Responsable des Risques-pays du Crédit Lyonnais

Dans le cadre de leurs activités internationales, les banques commerciales se trouvent confrontées à de multiples risques, dont le risque-pays, qui les ont conduites à mettre en place des services ad hoc ayant leur propre approche des problèmes et leur permettant d'effectuer des choix sur des bases rationnelles et objectives.

"LA SPECIFICITE DES RISQUES FINANCIERS PAR RAPPORT AUX RISQUES ECONOMIQUES"
Jacques Anthonioz, Responsable de l'enquête risque-pays de l'AFED, France.

Le risque-pays s'apprécie différemment suivant les préoccupations de celui qui l'étudie. C'est ainsi que les critères financiers apparaissent très spécifiques et se distinguent très nettement des autres, notamment des critères économiques.

LA PREVISION DES COMPORTEMENTS ELECTORAUX

Chair : André Donneur, Professeur, Département de Science Politique, Université du Québec à Montréal, C.P. 8888, Montréal Canada..

"VOLUNTARY EXPORT RESTRAINTS : FORECASTING PUBLIC SUPPORT FROM SURVEY DATA"

J. Alex Murray, Wilfrid Laurier University, Waterloo, Canada and Lawrence LeDuc, University of Windsor, Windsor, Canada.

Voluntary restraints on Japanese automotive exports to Canada and the United States has entered its sixth year. The extension of voluntary restraints for another yaer leaves smoldering dissatisfaction in both countries.

However, Canadians, like Americans are concerned about unemployment, inflation and many issues affecting their economy. When it comes to employment, one industry that ranks high in strategic importance is the automotive industry. The Canadian government is faced with a complet problem and multiple pressures affecting consumers, emplyoees, manufacturers, parts suppliers, and of course, the exporters in Canada's resource-base industries. It has been hinted that several Pacific Basin auto manufacturers have already initiated car assembly operations in Canada in order to lessen the pressure for voluntary export restraints and to prepare for higher, non-tariff barriers around the North American market. One of the major pressures the government feels it must respon to is public attitudes.

How does the Canadian public feel about solutions to this issue of foreign cars overtaking large portions of the market and the use of voluntary export restraints as a protectionist move? In order to uncover their attitudes, a large sample of 9,000 Canadians were personally interviewed over a three-year period from 1984 to 1986. This was the largest sequential survey on protectiomnism undertaken in Canada. The results of these surveys are presented and analyzed in this paper with the significance of trends on a longitudinal basis in light of the increased protectionism that has been initiated in many developed countries.

"SOME EMPIRICAL TESTS OF THE POLITICAL BUSINESS CYCLE"

Koot, Ronald S., Pennsylvania State University, University Park, Pa, USA. Young, Peg. George Mason University, Fairfax, VA, USA.

The purpose of this paper is to specify several business and electoral cycle hypotheses framed around two variables - the rate of unemployment and real disposable income per capita - in an ARIMA format. Intervening variables, such as Democratic/Republican regimes, war periods, reelection of incumbents, election year, and 2/4 year cycles, are tested for significance in the ARIMA models. Following the method of intervention analysis, the hypothesized impacts of these variables on the rate of unemployment and real disposable income per capital are validated or negated.

"ELECTORAL FORECASTING: THE CONSTRAINTS IN G.B."

Ian Budge, Professor, Dept. of Government, University of Essex, Wivenhoe Park, Colchester COA 3SQ, G.B.

No abstract.

"PREVISIONS ELECTORALES ET MANIPULATION DE L'INFORMATION"

J-D. Lafay, Université de Paris I, 12 Place du Panthéon, 75005 Paris. and D. Goyeau.

No abstract.

PLANIFICATION FINANCIERE ET STRATEGIQUE

Chair: Georges Hirsch, Professeur a l'Ecole Superieure de Commerce de Paris
Christian Hubaux, Hewlett-Packard, France.

"DEVELOPPEMENTS RECENTS DE LA PLANIFICATION STRATEGIQUE"
Georges Hirsch, Professeur a l'Ecole Superieure de Commerce de Paris - et Isabelle Deniset - Responsable du planning a Hewlett Packard France.

A quoi sert - et comment développer - la planification stratégique? En prenant le cas des entreprises de haute technologie, le papier identifie la façon dont le concept de planification a évolué depuis les cinq dernières années. Après avoir noté que de nombreux problèmes de planification proviennent de la compréhension, motivation, volonté et des capacités du management impliqué dans le procesus, les auteurs trouvent qu'il est raisonnable de se focaliser sur les aspects humains et organisationnels de celui-ci. Un étude de cas sert de référence à la discusion du thème du papier.

"PLANIFICATION FINANCIERE COMME FACTEUR DE COHERENCE DE LA STRATEGIE INDUSTRIELLE"
Francois Janny, Contrôleur Financier à la Compagnie Saint-Gobain et Georges Hirsch, Professeur a l'Ecole Supérieure de Commerce de Paris, France.

La planification dans l'entreprise industrielle est un des fondements de la stratégie industrielle avec la stratégie de recherche et développement. Elle est instrumentale en ce qu'elle définit le champ des possibles par les moyens qu'elle donne et les contraintes qu'elle fixe. L'étude ci-après examine les conditions dans lesquelles la planification financiere assure la cohérence de la strategie industrielle.

MACROECONOMIC FORECASTING : REAL ASPECTS AND FINANCIAL ASPECTS

Chair : Michel Develle, Directeur des Etudes Economiques et Financières Banque Paribas, 3, rue d'Antin, 75002 Paris, France.

"LA PREVISION DE TAUX DE CHANGE ET L'ANALYSE DU RISQUE PAYS"
Michel Develle, Directeur Banque Paribas, Paris, France

I Prévision de taux de change: 1. A court terme: Exposé de la méthode d'intégration et de pondération et différentes variables retenues pour la prévision de taux de change : axe général d'étude de l'offre et de la demand mondiale de dollars.
Porte folio, théorie, notion de retour globale, zone débitrice et créditrice au plan mondial. 2. A moyen terme: Mixage de la méthode suivie pour la prévision à court terme avec la parité du pouvoir d'achat et la théorie de détermination des taux de change par les taux d'intérêt (Irving Fisher). Intégration des autres variables fondamentales notamment prise en compte des cycles.

II Analyse du risque pays (risque souverain): Analyse à partir d'éléments quantitatifs et qualitatifs pour l'élaboration de fiches pays résumant structure, évolution récente, problème d'endettement et commentaire sur risque politique, industriel et financier. Eléments quantitatifs regroupés dans une base de données gérée par un logiciel adapté. Eléments qualitatifs, outre études et presse, échanges avec l'ensemble du réseau Paribas.

"FORECASTING EXCHANGE AND INTEREST RATE COUNTRY RISK ANALYSIS"
David R.V. Ashby, Group Chief Economist, Grindlays Bank, Montague Close, London SE1 9DH, UK.

Forecasting within an International Commercial Bank.

A. General Resource Constraints. Eclectic Judgemenal approach.
B. Exchange Rate Forecasting - Economic fundamentals versus market momentum examples of longer-term forecasting exercises. Relevance of purchasing power parity. Financial flows versus trade flows role for forward rates.
C. Interest Rate Forecasting - Money illusion and real interest rates. Supply/demand factors in short-term markets, inflation expectations in long-term markets.
D. Country Risk Forecasting - Data limitations. Importance of political judgements. Need for global macro-framework.

"L'ECONOMISTE ET LA PREVISION DES TAUX DE CHANGE ET DES TAUX D'INTERET"
Jean Cheval, Chef du Service des Etudes Economiques, INDOSUEZ, Paris.

Les évolutions actuelles posent un redoutable problème au métier d'économiste. La variabilité des taux de change et des taux d'intérêt est devenue telle en effet que 1) La prévision en est rendue très difficile; 2) Certains modes de raisonnement et certaines méthodes de prévision sont inopératoires; 3) La demande des opérationnels dans les entreprises et les banques ne correspond plus toujours aux produits traditionnnellement offerts par les économistes. L'economiste peut-il relever le défi? Oui, sans doute mais à plusieurs conditions. Celles-ci nous semblent pouvoir être ainsi résumées: 1) Mieux cibler les nouvelles démarches des entreprises; 2) Sortir de sa "tour d'ivoire" et se mettre plus à l'écoute des marchés; 3) Convenir que ses prévisions doivent aller de pair (et être confrontées à) avec d'autres approches (type "chartiste"); 4) Comprendre les nouveaux instruments qui apparaissent sur les marchés et savoir les utiliser pour ses prévisions; 5) Mieux définir (ou faire connaître) son rôle qui n'est pas le plus souvent - comme on persiste parfois à lui demander - de fournir des prévisions chiffrées à échéance donnée. On prendra exemple sur l'activité du Service des Etudes Economiques de la Banque Indosuez pour illustrer ces points.

JUDGMENTAL FORECASTING

Chair: Lajos Besenyei, Marx Karoly, Kozgazdasagtudomanyi, Egyetem, Budapest IX, Dimitrov Ter 8, Budapest, Hungary.

"EQUILIBRIUM - RELIABILITY - METHODS"

Lajos Besenyei, Associate Professor of Statistics, 1095 Budapest, Hungary.

The question of equilibrium between the past and the future is the basic problem of forecasting. The selection of appropriate methods determines the reliability of the forecast. We can find 3 different situations arising between past and future in practice: a) equilibrium b) partial conflict or c) full conflict> Unfortunately, the forecaster can only evaluate the above cases in the present. He only has complete information about equilibrium when the future becomes the present. Consequently, the forecaster has two main tasks. The first is to know as much information about the equilibrium situation of the present as possible. The second is to choose the appropriate forecasting methods in any given situations.

"NEW FUZZY INFORMATION AND BAYESIAN FORECASTING IN DECISION MAKING"

E. Kofler and A. Zimmermann, Institut für empirische Wirtschaftsforschung, der Universitat Zurich, Zollikerstrasse 137, CH - 8008 Zurich, Switzerland.

A general problem of economic decision making processes is to incorporate new information obtained as time goes by. Given complete information concerning a priori probabilities (p_i) and (normalized) likelihoods (r_i), probabilities can be updated using the Bayes formula.

However, likelihoods and a priori forecasts are not known exactly in general. Rather, linear partial information (LPI) such as e.g. $p_1>p_2>p_3$ and $a_i<r_i<b_i$ is given. In this paper, a theorem of the transition from LPI on priors LPI(p) to an LPI(q) on the posterior distribution in view of LPI(r) is proved.

For an illustration, this generalized LPI Bayesian forecasting procedure is applied to a portfolio selection problem. Let there be a joint distribution on expected returns (μ_{ij}) and standard deviations (σ_{ij}) which is restricted by LPI(p_i). The different outcomes are valued according to the payoff matrix $[\mu_{ij}, \sigma_{ij}]$, with i = 1, ..., m denoting states of nature and j = 1, ..., n actions (asset choices). After applying the LPI Bayes procedure, the LPI-optimal strategy α^* is determined, resulting in a portfolio structure guaranteeing a minimal expected payoff in terms of a LPI weighted vector (μ, σ). Moreover, we can put a value on the new fuzzy information LPI(r) by comparing the maxEmin payoffs of prior and posterior optimal strategies.

"TASK RELATED BIASES IN HUMAN JUDGMENT"

Michael Lawrence, The University of New South Wales, Australia

The results of studies on human judgment drawn from experiments involving general knowledge questions have been widely applied to judgmental extrapolation of time series. This paper compares human judgment in general knowledge tasks with human judgment in a time series setting with particular emphasis on confidence intervals.

"NUMERICAL AND VERBAL PROBABILITY JUDGMENTS AND THE UNCERTAINTY EFFECT"

Karl Halvor Teigen, University of Bergen, Norway

In subjective assessments of probabilities, the additivity assumption of probability theory is frequently violated. One reason seems to be that people tend to believe that the probability for an outcome or event can be determined individually, without considering the complete set of possibilities. When alternative outcomes are taken into account, their relative probabilities (higher or lower than the target outcome) appear to be more important than their number, or combined probability.

With a number of nearly equiprobable alternative outcomes, this leads to a heavy overestimation of chances. Unable to select a clear favourite, the probability assessor tries to keep several possibilities open, with the result that the combined set of probabilities will exceed 1.00. This "uncertainty effect" also manifests itself in choice of verbal expressions to characterize symmetrical vs. assymmetrical chances.

"MODELS OF HUMAN FORECASTING"

Andrew Mackinnon and Alexander Wearing, The University of Melbourne, Parkville, Victoria 3052, Australia.

One may distinguish two major approaches to the problem of providing a theoretical description of human forecasting behavious. In the first, a person is presumed to construct a model of a situation, feed in relevant information, compute, and produce a forecast or prediction. The approach is 'scientific' requiring indentification of system elements, measurement, and calculation on the basis of equations linking these elements. It is historical. In the second approach, an analogy is sought with the to-be-predicted situation, an analogy drawn from history or experience. This second approach involves pattern matching (the patterns sometimes inferred from fuzzy detail), and depends on memory. It is historical. Forecasting algorithms, decision procedures, and decision support systems typically employ the first approach. The ability of human beings to use these supports depends on the interface between their own support forecasting models. A series of experiments have been conducted to examine the extent to which human beings can (and do) use one model or the other. Implications of the results for forecasting are discussed, particularly with regard to decision support systems.

PREVISION ET PLANIFICATION

Chair: J. Netter, Diagma, 75 rue de Courcelles, Paris 75008, France

"PREVISION ET PLANIFICATION EN PRODUCTION"
J. Netter, Diagma, 75 rue de Courcelles, Paris 75008, France

Toute la session sera consacrée aux besoins très spécifiques des logisticiens en matière de prévisions de ventes.

Que ce soit pour planifier la production ou pour contrôler des stocks on a besoin de prévisions de ventes beaucoup plus fines que ne sont capables de les présenter les responsables commerciaux ou de Marketing.

On présentera donc un panorama des problèmes rencontrés, l'objet de la session étant de montrer comment ces problèmes sont traités.

"PREVISIONS DE VENTES ET PLAN DE CHARGE BRASSERIE"
Daniel Brun, Responsable planification Societe Européenne de Brasseries - Kronenbourg

On présentera dans cette intervention la méthodologie de planification de production chez KRONENBOURG.

Comment à partir de prévisions de ventes et d'erreurs prévisionnelles réactualisées, on affecte de manière optimale la production sur les brasseries (horizon 12 mois avec 16 premières semaines détaillées) et comment on planifie les besoins pour minimiser une somme de coûts qui comprend les coûts de transport, les coûts de production, les coûts matières et les coûts de stockage.

Le système fonctionne sur un IBM-AT relié a l'ordinateur central.

"COMMENT APPLIQUER UN PLAN DIRECTEUR de PRODUCTION OPTIMISE A UNE GESTION OPERATIONNELLE DES BESOINS?
Marc Ricoeur, Diagma, 75 rue de Courcelles, 75008 Paris, France

Le plan directeur a optimisé les coûts de production, de stockage et de transport. Il précise les avances de production et leurs lieux de stockage.

Une méthodologie adaptée permet de prendre en compte les contraintes "avances de production" et "stockage"; elle doit respecter les impératifs de qualité de service.

De plus, lorsque les quantités produites sont directement expédiées de la production vers plusieurs lieux de stockage, il est impératif de posséder des prévisions de besoins pour chacun de ces sites référence par référence.

"LA GESTION OPERATIONNELLE DES BESOINS : LES OUTILS ET LES TABLEAUX DE BORD"
Jean Goyard, Diagma, 75 rue de Courcelles, 75008 Paris, France

Pour suivre opérationnellement l'application d'un plan directeur de production, deux approches complémentaires sont necessaires:

- un tableau de bord doit permettre de vérifier en une simple lecture que les options du plan directeur sont respectées.
- un bilan de situation, référence par référence, permet de suivre l'évolution réelle et prévisionnelle des stocks, besoins et lancement.

TELECOMMUNICATIONS MODELING AND ANALYSIS : THEORY AND APPLICATIONS

Chair: D. Fane, Bellcore, USA.

"MODELLING THE TEMPORAL DEMAND FOR TELECOMMUNICATIONS"

A. de Palma, Université de Bruxelles, C.P. 139, Avenue F-D Roosevelt 50, 1050 Bruxelles, Belgique.

This paper derives a model which describes the temporal demand for Telecommunication. A fixed number of individuals are assumed to have to call during some period of time in the day. The capacity of the network is not large enough so that if the number of users is too large, some of them are not able to have a line immediately. As a consequence, some individuals may decide to move their call back and forth. A Nash equilibrium concept is used to compute the evolution of the demand in function of the time of day. Several extensions are discussed briefly and will be treated in future research.

"FORECASTING TECHNOLOGY ADOPTION"

Richard Gilbert, University of California, Berkeley and Jeffrey Rohlfs, Shooshan and Jackson, Inc., USA.

The rate at which users innovate by adopting a new technology has important implications for decisions involving the introduction, pricing, and regulation of new technologies and for the pace of technical change. Technology introduction is a combination of both production and marketing. A new product or service must be made available to potential consumers and those consumers must accept the new technology in place of competitive existing and new approaches.

Factors which limit the availability of a new technology are supply-side constraints on the rate of technology adoption, while those that affect the acceptance of a new technology are demand-side constraints. Demand considerations have occupied a more central role in the study of new product introduction, although adoption rates are determined by constraints acting from both directions. This paper discusses an approach to forecast technology adoption.

"A PORTFOLIO APPROACH TO CONSUMER TIME ALLOCATION"

Charles Ofori-Mensa and Mark Ortlepp, AT&T Communications, Basking Ridge N.J., USA.

In this paper we develop a portfolio approach to the allocation of time. This approach assumes that consumers have a portfolio of activities to which they can allocate their time to maximize their satisfaction. Allocation of time to each activity yields an observable rate of return in the form of enjoyment which contributes to total satisfaction.

The allocation of time to each discretionary activity depends on the rate of return that a consumer expects to obtain. Furthermore, demographic and activity specific factors also help to determine how much time each consumer allocates to each component of the activity portfolio. The total allocation of time to discretionary activities is constrained by the need to work and to maintain a household by doing certain non-discretionary activities.

In section I of the paper, the micro-foundations of the portfolio approach to time allocation is developed and parallels to traditional financial portfolio theory are drawn.

Section II sets up an empirical model which includes the following:

. The absolute time constraint of twenty four hours a day.
. The work and non-discretionary time constraints.
. A simultaneous equation system that relates time allocated to each activity to demographic and activity specific factors as well as to perceived rates of return for each activity.

In section III, data from a Time Diary survey conducted by the University of Maryland are used to estimate the empirical model. Members of 900 nationally representative households were asked to record what activities they participated in during a 24 hour time period. In addition, they were asked to record very specific information on their daily activities such as; the time of day an activity occurred, an ordinal enjoyment rating of each activity, whether others were present while the activity took place, and whether they were involved in another activity at the same time.

"FORECASTING IN A TECHNOLOGICAL DYNAMIC ENVIRONMENT"
J. Downs and R. Sherman,

No abstract.

"AN ECONOMETRIC MODEL TO ASSIST IN FORECASTING COST TREND IN THE TELECOMMUNICATION INDUSTRY"
Jonathan Sandbach, British Telecommunications, UK

The business planning of an organization requires accurate assumptions concerning the future cost trends of the inputs to that business. This is especially true when the different inputs, (eg. labour, materials, capital investment) are exhibiting different cost trends. A telephone network provider is faced with such a situation as larger degrees of new technology are introduced and used in conjunction with existing plant. Similarly, when comparing alternative investment strategies based on different technologies it is important to gain an understanding of the respective future cost trends involved.

British Telecom has built a system of econometric models that are regularly used to generate forecasts of price trends for the economy generally (such as the Retail Prices Index and Average Earnings) and also to build up consistent forecasts of sectors of particular interest to the company.

DECISION SUPPORT SYSTEMS I

Chair: Essam Mahmoud, The University of Michigan, Flint School of Management, Flint, Michigan 48502-2186, USA.

"FORECASTING SOFTWARE WITH DECISION SUPPORT CAPABILITIES"

David J. Wright, Faculty of Administration, University of Ottawa, Ottawa KIN 6N5, Canada.

Forecasting software often does not incorporate decision support capabilities and Decision Support software often incorporates only elementary forecasting methods. The present paper describes in general the type of software that can allow flexible access to a range of both forecasting procedures and also user-friendly decision support functions. A specific implementation is described using the LOTUS 1-2-3 DSS to perform ARIMA modelling with parameter estimation done via Kalman Filtering. This has the advantage that a user familiar with LOTUS does not need to learn the syntax or menu structure of a forecasting package. Examples of run times etc. are given.

"A STATISTICAL APPLICATION SYSTEM "ON LINE" DEVELOPED BY VALE DO RIO DOCE COMPANY, FOR MAIN FRAME COMPUTERS, ALL WRITTEN IN PL/I"

Sidnei Guimaraes, Manager of Sales Studies and Planning Division, Companhia Vale do Rio Doce, Av. Graca Aranha, 26 - 11 Floor, 20005 Rio de Janeiro, Brazil.

This system allows the user to feed a Data Bank and to execute one or more of the following routines:

i) Statistical Analysis (T test, F test, Kolmogorov Smirnov test, x^2 test, Stepwise, Variance Analysis).
ii) Multiple regression, including Box and Cox type of transformation on the variables.
iii) Continuous Graphics.
iv) Preliminary time series analysis including estimates of the mean, variance, autocorrelation function of the original series and corresponding differences.
v) Modeling and forecasts through six different Time Series Analysis Methodologies (Holt Winters, New Brown, Adaptative Filter, Moving Average, Univariate Box Jenkins, Transfer Function).
vi) Combined Forecasts Results.

"MICRO-COMPUTER SOFTWARE FOR FORECASTING: A COMPARISON OF TWO "UPPER-END" AND TWO "LOWER-END" PACKAGES"

Leonard J. Tashman, University of Vermont, James Brown, Burlington Electric Department and John. R. Bundy, Green Mountain Power Corporation.

There does not yet appear to be a 'man for all seasons' in the world of micro-software for professional forecasting. We have 'lower-end' packages characterized by comprehensive, palatable, but inflexible menus of univariate options. (Forecast Plus from Walonick Associates; P.C. Sibyl from Temple Barker and Sloane). We have 'upper-end' packages which can command both univariate and multivariate options, but which demand considerable infrastructure investment even for simple objectives. (MicroTSP Associates; and Micro-SCA, from Scientific Computing Associates). This paper will attempt to help both academics and industrial forecasters in choosing an appropriate type of package.

TIME SERIES FORECASTING APPLICATIONS

Chair: E. Lusk, The Wharton School, University of Pennsylvania, Social Systems Sciences Dept., Philadelphia, PA. 19104, USA.

"THE ROLE OF FORECASTING IN ESTABLISHING SPECIAL EXHIBITS IN MUSEUMS OF FINE ARTS"

E. Lusk, The Wharton School, University of Pennsylvania, Social Systems Sciences Dept., Philadelphia, PA. 19104, USA.

The author has interviewed the curators of special exhibitions of the Boston Museum of Fine Arts, the Metropolitan Museum of Modern Art, the Art Institute of Chicago, and the Philadelphia Museum of Fine Arts. The paper describes the role of forecasting in estimating the number of individuals expected to view a special exhibition. A number of suggestions are offered to help refine the use of forecasts for special exhibits.

"ADJUSTMENT METHODS FOR FORECAST-MODIFYING MECHANISM ON REGIONAL CONSTRUCTION ACTIVITIES IN THE UNITED STATES."

Soon Paik, Assistant Resarch Director, Construction Resources Analysis, University of Tennessee, 905 Mountcastle St., Knoxville, TN 37996-4150, USA.

First-stage forecasts on construction activities (29 end-use types, private-public ownerships, 50 states) are implemented by combining econometric models and time-series methodologies. Econometric models include both flexible accelerator theory and dynamic partial adjustment model, while time-series equations have the combination of time-trend with autoregression models. The forecast-modifying mechanism to improve first-stage forecast performance follows three steps utilizing three adjustment factors: (1) tracking signal factors in the ratio and detrend forms whose control limits are selected by probability basis; (2) growth adaptive autoregression parameters that are changing according to national growth patterns; (3) adaptive normalizing factors obtained from dividing forecasts of each region by the sum across all regions for each period.

"PLANNING UNDER UNCERTAINTY : USING INTERACTIVE DATA ANALYSIS"

Dr. Hans Levenbach, Core Analytic Inc, 674 Route 202-206 North Bridgewater, NJ 08807, USA, and Dr. Lilian Shiao-Yen Wu, IBM Research, Box 218, Yorktown Heights, NY 10598, USA.

We will discuss the use of GRAFSTAT, an interactive graphical data analysis sytem for formulating planning models for management decision and forecasting systems. In particular, we will show several case studies of how these kinds of analyses lead to (i) better understanding of the nature of the uncertainty in our data, and (ii) better forecasting and planning models.

LES PREVISIONS SECTORIELLES I

Présidents : Dominique Perreau, Directeur Général du BIPE,
Jean Malsot, Directeur du BIPE,
122 Avenue Charles de Gaulle
92522 Neuilly Sur Seine, France.

"LE BIPE : LES PREVISIONS GLISSANTES DETAILLEES A MOYEN TERME"
Dominique Perreau, Directeur Général du BIPE.

Le BIPE : structure originale d'ASSOCIATION et de CONSULTANT qui détermine fortement les méthodes et les produits;

Double exigence : la cohérence de la prospective macroéconomique et la signification opérationnelle des prévisions détaillées de biens et de services;

Methodes complémentaires :
* des hypothèses sur l'environnement international et les politiques économiques;
* mise en oeuvre des modèles macrosectoriels de l'INSEE;
* expérience sectorielle des experts du BIPE et des adhérents.

Conclusion :
* quel statut : indépendance dans les hypothèses et l'enrichissement des techniques de prévision;
* adaptation aux besoins diversifiés des utilisateurs.

"GROUPES EUROPEENS DE PROSPECTIVE : CONJONCTURE DES MARCHES EUROPEENS : 'LES EUROS', UNE VOLONTE D'APPROCHE EUROPEENNE DES MARCHES"

Jean Malsot, Directeur BIPE, France.

Le statut : des associations informelles de compétences;

Des ambitions inégalement réalisées;

Grande diversité des approches d'où la contrainte d'une mise en forme normalisée des prévisions;

Conclusion : quel avenir pour les "EUROS" ?

"EURO-CONSTRUCT : L'EVALUATION DE LA POLITIQUE DE RELANCE PAR LE BTP EN BELGIQUE"
Paul Kestens, Professeur au Dulbea de Bruxelles, Belgium.

Rappel de la crise du BTP en Europe;

Le débat sur la relance par le BTP;

L'évaluation de politiques alternatives

COMPARAISON REALISATIONS - PREVISIONS

Président : André Babeau, Professeur à l'Université de Paris IX - Dauphine
Place de Lattre de Tassigny, 75016 PARIS.

"MODELES MACROECONOMETRIQUES DE PREVISION DE L'INVESTISSEMENT ET ENQUETES DE CONJONCTURE"

Pierre Poret, Direction de la Prévision,

Les modèles usuels de prévision de l'investissement mesurent la contrainte keynésienne de débouchés susceptibles de peser sur lui par la production. Or la production, elle-même, peut être limitée a priori aussi bien par la demande que par une profitabilité insuffisante. L'estimation des modèles à plusieurs régimes de l'investissement s'en trouve théoriquement biaisée vers l'acceptation de l'hypothèse keynésienne.

Grâce à certaines réponses aux enquêtes de conjoncture dans l'industrie française, on est toutefois en état de connaître directement la tendance prévue des débouchés, ainsi que le taux de profit anticipé. Ces informations qualitatives sont intégrables dans un modèle économétrique du déséquilibre. L'intérêt de ce modèle à plusieurs "indicateurs avancés" est de permettre, très tôt, un diagnostic sur l'importance de l'investissement et sur l'influence respective de ses principaux facteurs, pour l'année en cours.

"LES REVISIONS DES COMPTES NATIONAUX"

Emmanuel Raoul, Chef de la Division des Comptes Nationaux Trimestriels, France.

Par les vertus que leur confère la rigueur du cadre comptable, les évaluations de la Comptabilité Nationale sont souvent considérées comme des données définitives. Or il n'en est rien : les Comptes sont réévalués au fur et à mesure que les statisticiens disposent de nouvelles informations, ce qui conduit à une trentaine d'évaluations successives (trimestrielles ou annuelles) étalées sur 4 ans.

L'ampleur des révisions des Comptes des années 1979 à 1984 est examinée pour six postes importants des Comptes nationaux. Restée limitée pour le PIB, cette ampleur est beaucoup plus grande pour certains agrégats comme l'investissement ou les postes du commerce extérieur.

"PREVISIONS ET REALISATIONS DANS LES DIAGNOSTICS CONJONCTURELS"

Jean Pierre Cling et Jacky Fayolle,
Administrateurs de l'INSEE, Division de la Conjoncture Générale et Unité de Recherche, France.

L'étude des prévisions du Service de la Conjoncture de l'INSEE entre 1969 et 1985 montre comment les prévisionnistes ont appréhendé la dynamique conjoncturelle à travers les trois cycles qu'a connus l'économie française au cours de la période. L'analyse qualitative des problèmes de la prévision en économie ouverte (la difficile perception des retournements; l'insuffisance de la connaissance du comportement d'offre des producteurs) est complétée par une comparaison quantitative des prévisions et réalisations (1982-1985). Celle-ci met en évidence le lien entre la précision de la prévision d'une variable, l'importance de ses fluctuations et la qualité de sa mesure statistique.

MACROECONOMIC FORECASTS FOR GOVERNMENTS AND PARLIAMENTS

Chair: H. P. Evans, H M.Treasury, Parliament Street, London SW1P 3AG, U.K.

"L'UTILISATION DES MODELES ECONOMIQUES AU SENAT DE LA REPUBLIQUE FRANCAISE"
Georges Chevallier, Republique Française, Senat, 15 rue de Vaugirard, 75291 Paris, France.

A partir de 1980, le Sénat a mis en place des procédures d'accès aux modèles économiques de l'Administration (Institut national de la Statistique et des Etudes Economiques; Direction de la Prévision), ou d'autres organismes. Des conventions ont été conclues qui précisent les responsabilités des uns et des autres de façon à respecter la séparation des pouvoirs. Cette formule permet au Sénat de faire l'économie d'investissements trop coûteux par rapport à ses besoins. Un exercice de projection à court ou moyen terme est organisé chaque trimestre. Ses résultats donnent aux Sénateurs des informations objectives sur les perspectives économiques générales et sur l'incidence macroéconomique de telle ou telle décision de politique économique. Il s'agit plus d'une aide à la réflexion que d'une aide à la décision, car la politique économique est un domaine qui, dans le système constitutionnnel français, relève essentiellement des compétences de l'Exécutif. Au surplus, l'économie française est très dépendante des décisions que prennent ses partenaires commerciaux.

"FORECASTING BY THE CANADIAN GOVERNMENT"
John Hayward, Department of Finance, Canada

The paper will describe the construction and use of economic models and forecasts by the Government of Canada, including central estimates for 8-12 quarters and several scenarios for 3-7 years.

"FORECASTS BY THE U.K. GOVERNMENT"
H. P. Evans, H M Treasury, Parliament Street, London SW1P 3AG, U.K.

Publication of Government economic forecasts; assessment of forecasting errors; measures of uncertainty; bias, especially in forecasts of output, inflation and the PSBR. Use of Government and private forecasts by Parliament.

TAUX D'INTERETS ET INSTRUMENTS FINANCIERS

Président : Florin Aftalion, Professeur à l'ESSEC, France.

"EFFICIENCE DES MATIF ET DETECTION DES OPPORTUNITES"

Charles de la Baume, Professeur au Groupe Ecole Supérieure de Commerce de Paris, France et
Yves Vichet, Directeur du Département Obligataire de la Charge Hamant et Carmignac, France.

Les nombreux accidents de taux d'intérêt qu'ont connus récemment les marchés financiers ont entraîné une instabilité des rémunérations propre à inquiéter les gérants de portefeuille. Les émetteurs ont apporté une première solution en proposant des titres à taux variables. Une seconde réside dans la mise en place de marchés à terme à l'image de ceux déjà existant sur les bourses de commerce : technique séduisante qui consiste à prendre sur des actifs fictifs (emprunt notionel par exemple) des positions inverses à celles constatées sur les portefeuilles d'actifs physiques. L'efficacité de la couverture exige un suivi permanent des rémunérations sur les deux marchés distincts, du comptant et du terme. Sa qualité est fonction d'une part des caractéristiques actuarielles du physique et du terme (hedge ratio) et, d'autre part, de l'adéquation des deux marchés (efficience). L'efficience des marchés est le résultat d'arbitrages permanents des opérateurs en présence de décalages instantanés. Seule une analyse fine en temps réel permet de détecter ces opportunités et d'initier les arbitrages qui conduiront à l'efficience.

L'analyse graphique, en assurant le suivi de la structure des taux actuariels et implicites des contrats, constitue un outil précis et facile d'emploi.

"L'INDUSTRIE DU RATING"

Bruno Thiry, Secrétaire Général de l'Association Française des Trésoriers d'Entreprise, Membre du Conseil National de Crédit, Professeur de Finance à l'ESCP, France.

L'industrie du rating est née aus Etats-Unis il y a 50 ans. Elle a pour objectif d'évaluer de manière indépendante le risque des émetteurs sur les marchés financiers. Le marché financier vit actuellement une mutation qui impose la création d'agences de rating. Bruno Thiry précise les conditions que ces institutions nouvelles doivent remplir et les méthodes à suivre pour apprécier le risque présent et prévoir le risque futur des émetteurs et de leurs papiers cotés sur le marché.

ECONOMIC AND ECONOMETRIC FORECASTING

Chair: Ahmet Aykac, International Management Institute, 4 Chemin de Conches, CH 1321, Geneva, Switzerland.

"THE INCLUSION OF VARIABLES IN A FORECASTING MODEL : SIGNIFICANCE LEVELS IN REGRESSION"

Zahid Y. Khairullah and Vinay Pandit, Saint Bonaventure University, Dept. of Management Science, Saint Bonaventure, New York, 14778, USA

The paper considers the incorporation of variables in a forecasting model via stepwise regression. The procedure addresses the question of the use of significance levels in an appropriate fashion. The model demonstrates how a given level of significance leads to type 1 errors in excess of the specified value.

"TRANSITORY VERSUS PERMANENT EFFECTS OF MONETARY POLICY ON OUTPUT : SOME CANADIAN EVIDENCE"

P.L. Siklos, Department of Economics, Wilfrid Laurier University, Waterloo, Ontario, Canada.

This paper further considers empirically the influence of changing policy rules on the money-output relationship. Using a technique which allows the decomposition of the output-money link into transitory and permanent components it is found that the specifications are unstable as Lucas (1976) hypothesized although a model fit to the whole period will not be greatly biased if the specification includes a fiscal policy measure or an exchange rate variable. We also find that past monetary policy influences current output except when a fiscal policy variable is added to the specification. Therefore, some of the results are consistent with the rational expectations hypothesis. Moreover, the influence of future monetary policy shocks on current output is relatively larger in the permanent component of the relationship. This is perhaps an indication of increased output variablility which is the result of attempts by policy makers to exploit the money-output relation, as Evans (1985) recently found for the US although the output-money relationship was not seen to deteriorate, in the sense of the explanatory power of policy shocks on output, across the frequency bands considered.

"BARNARD'S MONTE CARLO TEST FOR DEMAND HOMOGENEITY : MORE EVIDENCE AND ANALYSIS"

Baldev Raj, University of Florida and Wilfrid Laurier University and Timothy G. Taylor, Food and Resource Economics Department, University of Florida, Gainesville, Florida, 32611, USA.

Tests of general restrictions on systems of demand equations such as demand homogeneity can be performed one of three ways.

(1) Tests may be based on asymptotic theory, which utilizes the asymptotic density approximation of exact density for a statistic. However, such tests can be biased towards rejecting the null hypothesis in small sample situations. This was first shown by Laitinen (1978) for Wald's test, and subsequently by Bera, Byron and Jarque (1981) and Bewley (1983) for Likelihood Ratio and Language Multiplier tests. The asymptotic tests may be simple to derive and easy to perform but are

inaccurate when the sample size is small, see Sargan and Satchell (1985, p. 189).

(2) Tests may utilize exact or finite sample approximation of a statistic, if available. In case of demand homogeneity an exact test exists but its power may be limited in large demand systems such as the Rotterdam model with 14 goods and 31 time series observations.

(3) Finally, tests may be performed using Barnard's (1963) Monte Carlo procedure. These tests are distribution free and provide some freedom to the researcher in choosing test statistics for testing restrictions.

We evaluate the performance of these three alternatives through a large number of simulations. The error distributions are allowed to be both normal and fat-tailed. Further, we evaluate the performance of alternative tests under alternative hypotheses. Our results indicate that Barnard's Monte Carlo tests perform adequately and provide a viable alternative to testing restrictions on systems of demand equations, especially where exact tests are not available.

"FORECASTS AND THE CONSTRAINTS ON POLICY ACTIONS: THE RELIABILITY OF ALTERNATIVE INSTRUMENTS"

Carlo Bianchi, Centro Scientifico IBM, via s. Maria 67, 56100 Pisa (Italy), Jean-Louis Brillet Service des Programmes, I.N.S.E.E., 18 Bld Adolphe Pinard, 75675 Paris Cedex 14, and Giorgio Calzolari, Centro Scientifico IBM, via s. Maria 67, 56100 Pisa (Italy).

Multipliers are often used for selecting alternative policies in economic planning and forecasting. Particular variables like employment, trade balance, inflation or government budget usually impose constraints on the policy action. Therefore a criterion to be preferred to the raw multiplier should be a trade-off criterion which measures the effect of a variation of the instrument associated with a given cost on employment, trade balance, etc. The trade-off criterion computed from a macroeconomic model is obviously affected by uncertainty to some extent; a criterion which appears to be strongly effective might at the same time be affected by such a high degree of uncertainty as to recommend against its use. This problem of uncertainty will be investigated in this paper through experiments on the Mini-DMS model of the French economy.

POLITICAL RISKS

Chair: A. Khoshkish, Consultant, 186 Riverside Drive, New York 10024, USA.

"AN AHP APPROACH TO THE ASSESSMENT OF POLITICAL RISK FOR INVESTMENT IN ARGENTINA"

David A. Yamoah and A. Rizvani, Montclair State College, Upper Montclair, N.J. 07043, USA.

The paper aims at applying the Analytical Hierarchy Process, (AHP) model to foreign investment decision making under conditions of political risk.

The selection process takes into account investment alternatives, investment characteristics, and country econo-political factors, using Business International's established country risk factors in deciding on foreign investment in a target country. The investment and other characteristics are prioritized and an optimal selection is obtained through pairwise comparison of alternative investments.

Argentina is the target country but the model could be applied to any developing country where foreign investment decision is very much influenced by the political climate.

"APPROCHE BANCAIRE DU RISQUE POLITIQUE"

Henri Bouchet.

No abstract.

"MODELLING IMPACTS OF POLITICAL FACTORS ON SECTORAL AND REGIONAL DEVELOPMENTS IN CENTRALLY PLANNED ECONOMIES"

Jan S. Kowalski, Institut fur Wirtschaftsforschung und Wirtschaftspolitik, Universitat Karlsruhe, D-7500 Karlsruhe 1, Germany.

A mathematical model based on the "shortage economy approach" of J. Kornai, and on explicit political decision-making in Centrally Planned economies is presented. Purchases of inputs and investment decisions are taken in response to shortage signals and follow the political hierarchical distribution of power between regions and sectors. Polarization tendencies occur, i.e. strong regions and sectors tend to get even stronger in comparison with the weak ones.

PREVISION ET ASSURANCES

Président : Patrick Gougeon, Professeur de Finance au Groupe ESCP

L'originalité des compagnies d'assurance réside dans la double fonction qu'elles assument dans l'économie : une fonction de couverture des risques à travers la vente de contrat et une fonction d'investisseur institutionnel chargé de placer une épargne collective de précaution.

Il en résulte une très grande diversité de questions ayant trait à la prévision. En ce qui concerne l'activité financière des compagnies d'assurance (gestion de portefeuille) la problématique de la prévision ne diffère pas sensiblement de celle d'autres investisseurs sur le marché financier, c'est pourquoi nous privilégierons les aspects techniques. Les diverses interventions seront articulées autour de trois thèmes.

"LES PREVISIONS D'ACTIVITES"
Patrick Gougeon, Professeur de Finance au Groupe ESCP

La théorie de la demande d'assurance a pour objectifs de prévoir l'évolution de la taille du marché, de ses composants et de ses caractéristiques. L'auteur propose à travers diverses approches théoriques et empiriques de montrer la portée réelle et surtout les limites de ce type de raisonnement.

"LA RENTABILITE FUTURE DES COMPAGNIES D'ASSURANCES"
Philippe Espinasse, Assurance Générale de France
Patrick Sailly, Argus.

Cette communication explore les cycles de l'assurance, la théorie qui en est issue, et examine sa validité à travers l'analyse de comportement des principales compagnies. Les auteurs étudient les modes de régulation du marché et leurs conséquences sur les cycles et la rentabilité des compagnies. Enfin, ils proposent une approche des conséquences des phénomènes précédemment analysés sur l'évaluation des sociétés d'assurance.

"PREVISONS EN MATIERE DE RENTABILITE ET PRINCIPES DE TARIFICATION"
Michel Rey

L'auteur présente une application de la méthode de scénarios à la prévision des sinistres. Il s'agit là d'une approche à la fois complémentaire et concurrente de l'analyse des chroniques disponibles et de la prise en compte de cycles. Il en déduit une approche nouvelle des principes de tarification des contrats.

"MODELLING AND FORECASTING OF INSURANCE PREMIUM : A CASE-STUDY"
Nazira Gait, University of Sao Paulo-P.O.Box 20570,
Sao Paulo - BRAZIL.
Ruy L.Antunes University of Sao Paulo-P.O.Box 20570,
Sao Paulo - BRAZIL.

In an earlier study (presented at V ISF, Montreal 1985), we have applied spectral analysis and ARIMA modelling for the series of insurance premium earned by an insurance company of Sao Paulo.
We were faced with two problems: a) the length,
b) the strong irregularity of the series.

Now, we have the extended series until December 1985; we intend to apply ARIMA modelling with and without intervention, to compare the results obtained in the first study and to perform the analysis.

MARKET FORECASTING

Chair: Scott Armstrong, University of Pennsylvania, Pennsylvania, USA

"HOW TO USE THE SUBJECTIVE SIDE OF ECONOMIC BEHAVIOR FOR FORECASTING PURPOSES"

Dr. Kuno Rechkemmer, Daimler Benz AG, Robert Bosch Strasse 67, D - 7000 Stuttgart 1, Germany.

The paper deals with the use of subjective variables for forecasting purposes. Starting point is a model of economic behavior which puts special emphasis on moods and expectations. The model results in a behavioral function according to which economic behavior a.o. is determined by the (positive or negative) surprises experienced in previous periods.

The theoretical outcome is tested econometrically on basis of anticipations variables surveyed in the US. The empirical results are very promising, not only because the parameters of the model become identified but also because there is a strong interdependency between the surprises of "today" and the behavior of "tomorrow" which can be used for forecasting purposes.

"WHY YOUR FORECAST DOESN'T WORK : UNDERSTANDING THE IMPACT OF PRODUCT RANGE DYNAMICS ON FORECAST ACCURACY"

Jay Nathan, University of Scranton, Scranton, PA 18510 and John Pullo, Gentex Corporation, Carbondale, PA 18407, USA.

This paper presents a framework for the impact of customer and product structures on the accuracy of forecasting models. This research brings forth the dynamic relationships among marketing-mix variables, policy and customer-size variables. Finally, a suggestion for more "active" forecasting incorporating the systematic changes are described.

"AUTOMATED INTELLIGENCE FOR FORECASTING, DIAGNOSING, AND GENERATING NEW MARKETING PLANS : APPLICATIONS OF LITMUS II"

Kevin J. Clancy Ph.D, School of Management, Boston University, USA

For two decades, marketing researchers have employed two distinctly different approaches for forecasting new product performance: simulated test marketing research systems (used prior to an actual new product introduction) and mathematical models of the marketing mix (employed following a test market, regional, or even national launch).

The original LITMUS model represented a marriage between LTM (Laboratory Test Market) and NEWS, theoretically offering the advantages of both

approaches, providing a comprehensive and highly flexible model for forecasting and diagnosing new product introductions.

In the six years since its introduction, LITMUS has produced a strong track record where model forecasts have been compared against real world performance. In total, the model has been used by 56 different firms in launching or relaunching 168 products and services in 47 different lines of business in 5 different countries.

The purpose of this paper is to describe the current version of the model, LITMUS II and to discuss its use in forecasting and diagnosing the performance of new marketing campaigns before, during, and/or after an actual test market experience. The model's conceptual and mathematical underpinnings will be highlighted as well as the marketing research data and marketing plan information which are required in order to undertake a forecast. There will be an emphasis on the "automated intelligence" capabilities of LITMUS II.

LA PREVISION DU RISQUE DE CHANGE

Président : Alain Chevalier, Professeur au Groupe ESCP, France.
Gabriel Hawawini, Professeur à l'INSEAD, Fontainebleau, France.

"RECENT TRENDS IN TREASURY MANAGEMENT IN AMERICAN BANKS"
Jyoti Gupta, Professeur au Groupe ESCP,
Kathryn B. Swintek, Irving Trust Co.

Cette communication a pour objectif de présenter un panorama des développements récents en matière de prévision et de gestion de trésorerie dans les banques américaines : redéfinition des objectifs, introduction de nouveaux outils, utilisation de nouveaux produits et des nouveaux marchés.

"A TENTATIVE BREAKDOWN MODEL OF EXCHANGE RATE EXPECTATIONS"
Jean Claude Usunier, Professeur à l'Université de Grenoble II, ESCP,
Régis Bourbonnais, Maître Assistant à l'Université de Paris II.

Cette contribution présente une modélisation du comportement des opérateurs intervenant sur le marché des changes. Nous intégrons différents niveaux d'anticipation représentés par des variables telles que les taux d'inflation, les taux d'intérêt, l'effet des "nouvelles", les interventions institutionnelles représentées par des variables muettes, etc.

Un modèle de court terme est élaboré selon la théorie des anticipations rationnelles.

Ce modèle sera testé à partir de trois cours de change, $/DM; FF/DM, $/FF, pour intégrer les influences croisées (par exemple les variations du cours $/DM comme variable explicative du cours FF/DM).

"LA DIVERSIFICATION OPTIMALE DE PORTEFEUILLES ET LE RISQUE D'ESTIMATION"
Bernard Dumas, Professeur à l'Université de Wharton et au Centre HEC/ISA.
Bertrand Jacquillat, Professeur à l'Université de Paris IX Dauphine et au Centre HEC/ISA.

La diversification optimale de portefeuilles exige que l'on connaisse les espérances, les variances et les corrélations deux à deux de tous les titres. En pratique ces parametres ne sont pas connus. La coutume a été de les remplacer par des estimateurs dans les formules qui calculent ce portefeuille optimal. Mais il est clair que ces estimateurs sont par essence imprécis, ce qui a un effet désastreux sur la composition des portefeuilles calculés. Cet article utilise une technique Bayesienne pour remédier à ce probleme. La performance de la politique de portefeuille résultante est mesurée sur des placements en euro-devises pour la période 1967 à 198[illegible].

"EXCHANGE RATE FORECASTING"

P. McMahon, Professor, University of Birmingham, Dept. of Economics, P.O. Box 363, Birmingham, B15 2TT, U.K.

No abstract

NEW TELECOMMUNICATIONS SERVICES : STRATEGIES AND FORECASTING

Chair: M. Gensollen, DGT, France.

"LA CLIENTELE DU VIDEOTEX GRAND PUBLIC : L'ANONYMAT ET SES CONSEQUENCES"

C. Ancelin, Ministère des PTT, 20 Avenue de Ségur, 75700 Paris, France.

1985 a marqué un tournant pour l videotex en France. Le parc de terminaux minitel était de plus d'un million à la fin de l'année, et près de 2 000 services existaient. Des systèmes de rémunération des fournisseurs de services sont en place : le videotex a quitté la logique des expériences pour une logique de marché.

Pour autant il est loin d'avoir épuisé le champ des réflexions. Parmi toutes les questions que pose le développement de videotex grand public à ses promoteurs, cette communication s'attachera à montrer comment les caractéristiques du système videotex francais (terminal mis gratuitement à disposition, tarification ...) et celles de son marché (types de trafic,...) s'influencent mutuellement, ont permis l'apparition d'une clientèle anonyme et pèsent sur certaines décisions strategiques des promoteurs tant public que privés.

"GENERAL PUBLIC VIDEOTEX'S CUSTOMERS: THE CONSEQUENCES OF THEIR ANONYMITY"

C. Ancelin, Ministère des PTT, 20 Avenue de Ségur, 75700 Paris, France.

The year 1985 marked a turning point for videotex in France. With the total number of Minitel terminals in use surpassing one million, the number of services approaching two thousand by the year's end, and existing means for the informations providers to be paid, videotex had moved from a logic of experimentation to one of the market-place.

Despite videotex's advanced level of diffusion in France, important research issues remain to be addressed. Among the many questions that the development of general public videotex raises for its promoters, this paper attempts to show how the characteristics of the French videotex system (for example the free distribution of terminals and the pricing levels) and those of its market (for example levels and types of traffic) interact, allow to anonymous customers the use of the system, and influence certain strategic decisions of public and private promoters.

"FORECASTING USER DEMANDS AND DESIGNING A MOBILE DATA COMMUNICATIONS SERVICE"

Helge Godo, Norwegian Telecommunications Administration, Research Establishment, Norway.

The paper will present a study undertaken to analyse user demands of a public mobile data communication service that will be introduced in Norway in the next few years. The concept of this service has evolved from the successful cellular mobile telephone service, the Nordic Mobile Telephone (NMT). The demand for the latter has been so unpredictably high, that strategies to economize radio frequencies have become mandatory. The concept of a mobile data communication service is based on observations that

much information transmitted today on mobile telephone systems are types of information more suitable for direct text and data communications. In addition, the service will provide a message handling system (MHS) and facilities like broadcasting, closed user groups, emergency channels etc.

The actual study of user demands has proceeded in three stages. First, a pilot project which aimed at identifying the potential user groups of a mobile data communication service, and specifying their degree of mobility in terms of parallel needs for information and communications was completed. Based on this, in the second stage of the study, a detailed, in-depth analysis of 5 firms and organisations was undertaken. These firms/organizations were selected on criterias of task structure, degree of physical mobility and organizational complexity, and factors of time and speed involved in their operations. In this analysis, the microeconomic approach utilizing a broad range data collection methods was used to identify and specify functional requirements for the mobile data communication service. Based on the insights and assumptions generated by the previous studies, the third stage of the project will provide input for estimating and forecasting the general demand, thus providing foundation for the design of the system and forecasting its subsequent diffusion.

"'PREVOIR' LE RNIS"
Michel Volle, CNET, France

Quelle est la place de la 'prévision' lorsqu'on considère un grand projet au stade de sa mise au point technique, alors que les coûts sont incertains, les tarifs non décidés, les produits et la cible commerciale en débat?

Ici moins qu'ailleurs, la prévision chiffrée ne peut être une fin en soi. Cependant les exigences du calcul - explicitation des hypothèses, cohérence des concepts - conservent une utilité. Tirer les conséquences de choix variés d'hypothèses apporte des surprises riches parfois en enseignements. La difficulté de certains choix (notamment tarifaires) attire l'attention sur des questions d'ordre théorique.

Modeste outil d'exploration, soumis à de nombreuses variantes, le calcul dit prévisionnel trouve alors sa finalité dans ses conséquences qualitatives; il signale des questions stratégiques qui se seraient certainement posées sans lui, mais plus tard.

"'FORECASTING' THE ISDN"
M. Volle, CNET, France

What is the part played by 'forecasting' in considering a big project in the phase of technical development, when costs are uncertain, tariffs not defined and market targets in discussion?

In this case, more than in others, quantitative forecast cannot be a goal per se. But the implications of calculation - statements of hypothesis, coherence and concepts - remain useful. There can be sometimes very interesting surprises when looking at the consequences of different choices of hypothesis. Some choices are difficult (especially on prices) and lead to focus on theoretical issues.

Quantitative forecasting appears to be a modest tool which has to be worked out with numerous scenarios. The goal to reach is rather the exploration of its qualitative consequences : this device may lighten strategical questions which could have been ignored for long.

"TELECOMMUNICATIONS FORECASTING FOR NEW SERVICES"

D. Naylor, PA Computers and Telecommunications, 33 Greycoat Street, London SW1P 2QF, UK.

The emergence of numerous new telecommunications services poses problems in forecasting user demand; little, if any, historic information is available about these services. The rate of technological change, the convergence of telecommunications and computing, and the advent of competition pose further problems for national telecommunications authorities in developing their long-term plans. The author argues that in such an environment the forecaster must examine the total communications needs of a potential user in order to identify possible demand for any new service, and then take into account the numerous constraints that hinder the realisation of that demand. Secondly, he argues that the uncertainty in all the external factors means that a scenario-based approach is needed; identifying possible futures is more important than a detailed evaluation of the most likely outcome. To illustrate these points the author describes a study commissioned by the Eurodata Foundation to develop forecasts of non-voice communications in Europe to 1995. This study drew on systems dynamics and decision support techniques in the development of a micro-computerised forecasting model.

TOPICS IN FORECASTING

Chair: Michèle Hibon, INSEAD, Bld. de Constance, 77305 Fontainebleau, France.

"PITFALLS OF FORECASTING"

F. A. van Vught, Professor of future studies, Leyden University, The Netherlands.

In this paper the methodology of forecasting will be divided into a metholodology for prediction and a methodology for design. Both these methdologies will be addressed from the perspective of some fundamental notions in the philosophy of science. These fundamental notions include: the problem of induction, the rejection of scientific determinism and historicism, the level of development of social theories and the rejection of utopism.

The conclusion is, that both the methodologies of prediction and design should be very modest in their striving to be scientific.

Forecasting is considered to be a practical and future oriented approach to the support of decision making. It is wise to realize that the basis of this approach is soft and shaky.

"THE INDUCTIVE FOUNDATIONS OF FORECASTING"

P. M. van der Staal, Rijksuniversiteit te Leiden, Rapenburg 59, 2311 GJ Leiden, Netherlands.

Inductive inferences are inevitable elements in the methodology of forecasting. Inferences entailing true predictions (by definition valid statements on unobserved facts) should necessarily be as well truth transmitting and preserving as content expanding. As Hume already decisively has demonstrated induction is no logically valid procedure and thus not able to solve this dilemma.

In the paper some current approaches in the philosophy and methodology of science concerning the justification of induction will be analysed. The conclusions will be applied to identified inductive elements in a selection of rationally reconstructable forecasting techniques. Finally suggestions will be made to increase the rationality of forecasting methodology.

"GRAPHOSCOPY : THE RECORD OF THE FIRST SIX YEARS"

Shalom Apeloig, Ifo-Institut für Wirtschaftsforschung, Postfach 86 04 60, 8000 Munchen 86, Germany.

Graphoscopy is a new method for direct and metrically scaled measurement of people's expectations of economic developments over time. The innovation consists in graphing the past movement of an economic variable - in this case the index of net production, seasonally adjusted and smoothed, for a number of manufacturing branches - and to ask the survey participants to extend these graphs freehand according to their expectations of the future cyclical course during the given forecasting period.

The given reference series allows the participant to view the projection of future developments in close context with the past and present situation. This way the survey method provides information on base data and at the beginning of the forecasting period and allows the participant to render a complex and detailed description of anticipated developments, including such details as the timing of turning points as well as shape, duration, and intensity of the expected upswings or downswings.

In contrast to the survey methods used up to now, the participants' complex pattern of anticipations is not reduced to one single signal ('better', 'unchanged', 'worse' in the Business Survey of annual average rates of change in the Investment survey and "Prognosis 100") but is provided in the form of a differentiated, in the respondent's mind primarily qualitative judgment. Yet, we are dealing here with a metrically scaled measurement which means that the participant himself quantifies, consciously or unconsciously, his judgment.

The electronic scanning of the individual ex-ante curves and their condensation into averages resulted in clear and plausible cyclical developments for the individual industries. This is also true for the major industry groups and the manufacturing industry as a whole. The transformation of the condensed curves into anticipated annual average rates of change has meanwhile revealed at the industry level a very satisfactory degree of accuracy, an accuracy which after aggregation into major industry groups and the manufacturing industry, proved to be even higher. The enrichment of the graphoscopical method with econometrical means to cope with systematic underestimation phenomena in the upswing and overestimation in the downswing periods of the business cycle as well as weighting the single graphs of the participants according to their degree of accuracy in the previous surveys led to forecasts, which proved to be almost perfect. In contrast, the formre method of asking for the expected average annual rate of change produced seriously erroneous forecasts, especially in times of cyclical reversal.

Graphoscopic survey methods are not restricted to business cycle analysis and metrically scaled anticipations. Rather, with their help any dynamic anticipation trend, for which an ex-post reference series exists, can be made transparent, be it exchange rates, interest rates, stock prices, changes in trend, etc. Last not least, the graphoscopic methods should be perfectly suited as input into numerous Delphi inquiries.

"THE AKAIKE CRITERION VERSUS THE SCHWARZ CRITERION FOR MODEL FITTING"

Anne Koehler and Emily Murphree, Miami University, Oxford, OH, USA.

The objective of this paper is to compare the Akaike Information Criterion (AIC) and the Schwarz Criterion (BIC) when they are applied in the crucial yet difficult task of choosing an order for a model in time series analysis. Three different order selection procedures are used to fit state space models. Models are fit to a randomly selected subset of monthly data in the 1001 series from the Makridakis Competition. The three criteria are found to lead frequently to the selection of models of different order for the same time series. The forecasting accuracy on 18 months of withheld data is compared for the models that are identified by the three methods.

DECISION SYPPORT SYSTEMS II

Chair: Essam Mahmoud, The University of Michigan, Flint School of Management, Flint, Michigan 48502-2186, USA.

"FORECASTING WITHIN ITS CONTEXT DATA BASE REQUIREMENTS AND DECISION SUPPORT APPLICATIONS"

David J. Wright, Faculty of Administration, University of Ottawa, K1N 6N5, Canada.

Forecasting methods are often evaluated by comparing accuracy rather than by investigating impact on management decisions and also access to data bases is assumed at no cost. The present paper sets forecasting within its context of data base requirements and decision support applications. Alternative forecasting methods for interest rates and exchange rates are evaluated with respect to borrowing and purchasing decisions and conclusions are drawn regarding the position of the forecasting function in an organization vis-à-vis the decision making/planning functions. Improvements in forecasting that can be achieved through the availability of a larger data base are investigated in relation to government statistics and cash management. Conclusions are drawn regarding cost-benefit analysis of data bases for forecasting.

"EVALUATING DATABASES FOR BUSINESS FORECASTING AND PLANNING : AN EMPIRICAL STUDY OF DATABASE VENDORS AND SUPPLIERS"

Gillian Rice, School of Management, The University of Michigan-Flint, Flint, MI 48502-2186, USA

Managers face the important and often difficult task of selecting databases that are sufficiently accurate and reliable to produce good forecasts. This paper reports the results of a mail survey of database vendors and suppliers. The objective of the study was to evaluate business databases for forecasting and planning. In particular, the study examined four aspects of databases: completeness, availability, timeliness, and accuracy. On the whole, the results suggest very sufficient database availability and completeness on the part of respondents, although improvements could be made with respect to timeliness and accuracy.

"A FIELD STUDY OF MANAGERIAL EVALUATION OF THE FORECASTING DECISION-SUPPORT"

Dr. Kranti Toraskar, Drexel University, Management Department, Room 6-221, Philadelphia, PA, USA 19082

A systematic study was conducted at four sites to investigate if, and how, individual managers evaluate the forecasting decision-support they use. Rich data-base resulted from a sequence of focused interviews designed around presentation of alternative evaluation frameworks identified from the literature. Analysis of the qualitative data has resulted in a hierarchic structure of "conceptual categories" which seem relevant in evaluation of the forecasting function in its organizational context. The individual managers clearly appear to seek, develop, and use certain types of information toward an "Ad Hoc evaluation" of forecasting. The existence of such ad hoc evaluation is supported by cognitive and factual data, including an input-process-output model. The study reveals major organizational considerations which the managers find important in forecasting evaluation. The managers also found the alternative evaluation frameworks to be different enough to rank-order them. Overall, the study results imply that evaluative information about forecasting may be useful in 'guiding' the managerial 'judgement' in the use of forecasts. From the standpoint of design, it seems desirable to formalize the 'presence', if not the method, of forecasting evaluation in organizations. Finally, the structure of the organizational considerations, and the ranking criteria, indicate desirability of "conceptual segmentation" of forecasting evaluation into its technical and managerial tiers.

LES PREVISIONS SECTORIELLES II

Présidents : Dominique Perreau, Directeur Général du BIPE,
Jean Malsot, Directeur du BIPE,
122 Avenue Charles de Gaulle
92522 Neuilly Sur Seine, France.

"EURO-INVEST : PREVISION DU MARCHE DES BIENS D'EQUIPEMENT EN ALLEMAGNE"
Dr. Gerstenberger, IFO de Munich, Germany.

- Rappel du rôle assigné aux investissements dans la sortie de crise de l'économie européenne;

  Les fonctions de l'investissement (rationalisation, accroissement de capacités, énergie ...) et les marchés des biens d'équipement;

- Méthodes de prévision mises en oeuvre par l'IFO de Munich.

"EURO-CONSUM : PREVISIONS DES ACHATS DES CONSOMMATEURS"
Mr. Tantazzi, Institut Prometeia de Bolougne, France

- Rappel du comportement de consommation en Europe pendant la crise;

  Hétérogénéité des évolutions par types de marchés : biens durables, semi-durables, biens non durables et services;

  Les méthodes mises au point par PROMETEIA pour la prévision des marchés de consommation italiens.

Président : Bernard Thion, Prof.. Ecole sup. de Commerce de Bordeaux

"PEUT-ON PREVOIR L'EVOLUTION DES PRIX DANS L'IMMOBILIER?"

Bernard Thion

La prévision des prix, en matière d'immobilier, est difficile dans la mesure où le marché semble perpétuellement déséquilibré. L'objectif de cette communication est d'exposer un modèle simple de détermination des prix à partir de trois composantes élémentaires, de présenter les résultats d'une vérification empirite faite sur la ville de Toulouse entre 1980 et 1983 et de proposer quelques aménagements au modèle ainsi testé pour l'estimation des prix futurs.

"QUELLES PERSPECTIVES MACROECONOMIQUES POUR LA CONSTRUCTION DEMAIN?"

Michel Mouillart, Université de Paris X Nanterre, France.

L'analyse macroéconométrique des tendances passées de la construction de logements permet de préciser l'importance respective des principales causes de la chute des mises en chantier : depuis 1979, le désengagement budgétaire de l'Etat, les politiques monétaires restrictives, une stratégie de réorientation de l'épargne des ménages et les difficultés économiques générales (inflation, chômage et baisse de pouvoir d'achat) sont suffisantes pour expliquer cette chute.

L'utilisation de scénarios macroéconomiques à moyen terme, en précisant les hypothèses d'environnement économique, monétaire et budgétaire, permet de décrire les perspectives de la construction de logements dans les prochaines années et de mesurer le niveau d'efficacité de quelques mesures de relance du secteur.

"LE LOGEMENT AU CARREFOUR"

J.P. Betbeze, Professeur à l'Université de Franche-Comté, France.

La contraction nette de l'activité que ressent le secteur du logement peut être expliquée de plusieurs manières. Evolution de la démographie, choix spécifiques du ménage, mutation de la croissance, rôle de "bouc émissaire" dévolu à ce domaine, telles sont les explications les plus fréquemment fournies.

Face à ces réponses, il parait plus fécond de poser la question inverse : comment comprendre la croissance passée, forte et régulière de la construction ? Une thèse peut être avancée : le logement a bénéficié d'un traitement relativement favorable, à la suite d'un véritable "compromis institutionnel" qui s'est donné pour objectif d'organiser son développement au moindre côut global, en structurant en particulier son mode de financement.

Aujourd'hui, ce compromis est rompu.

D'ou l'idée d'étudier les stratégies des offreurs, en particulier leurs volets offre et demande, pour mettre l'accent sur un "manque" central : l'absence de réflexion en termes de "nouveau compromis".

"LE MARCHE DE L'ANCIEN DANS LES ANNEES FUTURES"

Françoise Taieb, SCI de la Caisse de Dépots, France.

Le marché du logement a été dominé par le marché du logement neuf du fait d'un effort exceptionnel de renouvellement et d'accroissement du parc immobilier et de l'encouragement systématique à l'accession à la propriété.

Désormais, le ralentissement de la production neuve et le recyclage de la propriété déplace l'activité du marché vers le logement "ancien".

La moitié du parc collectif urbain est constitutée de logements construits entre 1949 et 1975. Un enjeu de la période de 5 à 10 ans à venir va être le réinvestissement à opérer dans ce parc; ce sera l'occasion d'une activation du marché ou au contraire de la dévalorisation massive du patrimoine urbain.

KALMAN FILTERING

Chair: J. Deshayes, France.

"PREDICTION OF SPATIALLY STRUCTURALLY VARYING ECONOMIC SYSTEMS"
Anders H. Westlund, Department of Statistics, University of Umea, S-901 87 Umea, Sweden.

Prediction of structurally varying economic systems must be based on a structural analysis with the purpose of identifying and characterizing the structural variability. This paper includes an analysis of a model for spatial structural variability. The model assumes that structural variability is represented by a stochastically convergent spatial parameter variability model, and pure random parameter variability over time. The structural model, including the parameter variability model, is reformulated such that estimation by Kalman filtering is possible. The recursive Kalman filtering formulae are derived subject to two sets of a priori specifications.

"FORECASTING INTERRELATED PARTS AND THEIR SUMS : A NEW CLASS OF NON-GAUSS-MARKOV STATE SPACE MODELS AND AN APPLICATION."
Frenck Waage, AT&T Technologies Inc., Forecasting and Techniques Department, Gateway Two, Newark, New Jersey 07102, USA.

This paper reports a new method for forecasting sales in contexts frequently encountered in applications; those in which parts and their sums must be dealt with simultaneously in such a fashion that the results become internally consistent. In practice, these include simultaneous forecasting of market shares, forecasting of multiple and simultaneous lifecycles, forecasting sales of all the products in a given market and forecasting the size of a total market from knowledge of its parts. The method is supported by a state space model built on Dirichlet-Polynomial stochastic processes in both forecasting and observation processes. These processes require the random variables to vary between upper and lower finite bounds, a feature which permits subjective knowledge to enter directly into the model. This model differs in many important respects from the normal process based state space model which generates the widely known Kalman filter.

PROSPECTIVE DES MODES DE VIE ET VALORISATION DES SCIENCES HUMAINES ET SOCIALES

Chair: A. Etchegoyen, SHS Consultants, 14 rue Cambon, 75001 Paris, France

"UTILISATION DE LA PROSPECTIVE SOCIALE PAR QUELQUES ENTREPRISES AMERICAINES"
Aude Debarle, agrégée de Sciences Sociales, Paris, France

"PROSPECTIVE DE LA DISTRIBUTION ET MODE DE VIE"
Dominique Desailly, SHS Consultants, 14 rue Cambon, 75001 Paris, France

"L'OFFRE DES PROSPECTIVES DES MODES DE VIE EN FRANCE"
Alain Etchegoyen, SHS Consultants, 14 rue Cambon, 75001 Paris, France

La prospective des modes de vie constitue un objet privilégié pour les acteurs sociaux et notamment pour les entreprises. Les modes de vie eux-mêmes, en ce qu'ils comportent d'habitus sociaux, de pratiques de consommation et de formes d'organisation de la sphère privée constituent un objet essentiel des Sciences de l'Homme et de la Société. On devrait donc avoir là, par principe, un lieu privilégié d'utilisation des SHS par les hommes et la société.

Or les ambiguités qui se font jour dans la relation entre la demande des entreprises et l'offre de recherches fournie par la communauté scientifique constituent un symptôme intéressant et partinent des difficultés à valoriser les recherches en SHS. L'on peut ainsi constater que ces difficultés sont liées à des obstacles beaucoup plus fondamentaux que des questions de langage ou de relations institutionnelles.

A travers les exemples de quelques grandes entreprises américaines (Aude Debarle) et des problèmes posés par la distribution de produits industriels (Dominique Desailly) on essaiera d'examiner concretement comment des acteurs sociaux envisagent la question du recours à la prospective des modes de vie.

Encore faudra-t-il montrer que ce recours détermine-(puis est déterminé par?) une offre de recherche et d'étude qui, entrant en concurrence avec les produits de la recherche scientifique institutionnelle, correspond à des priorités peu compatibles avec la démarche scientifique elle-même. Les produits présents sur le marché et disponibles pour les entreprises constituent autant d'écrans qui s'appuient surles carences de la recherche publique et d'une certaine façon la confortent dans ses propres carences (Alain Etchegoyen). En effet, à partir d'un constat très critique sur les limites effectives des recherches macrosociales, des projets ambitieux sont apparus qui ont tres vite abandonné les préoccupations scientifiques pour s'adapter à une demande qui souhaite plus être séduite que convaincue. La prospective des modes de vie utilise alors des catégories et des concepts dont la construction omet des préoccupations épistemologiques élementaires.

FORECASTING IN BRAZIL

Chair: Nazira Gait, Department of Statistics, University of São Paulo, São Paulo, Brazil.

"RELATIONS BETWEEN RAINFALL AND MEAN SEA LEVEL"
Clelia M.C. Toloi, Nazira Gait and Pedro A. Morettin, University of São Paulo, P.O. Box 20570, Brazil.

An analysis of causality (presented in another paper, at V ISF, Montreal, 1985) showed that the mean sea level series leads the rainfall series with a lag of 6 years.

Now, we are applying multivariate analysis and transfer function modelling to confirm our first results.

"BRAZIL RAINFALL FORECASTING"
Professor Harvey and Professor Souza.

No abstract.

"MODELLING BRAZILIAN SOYBEAN PRICES"
Francisco Pino, Institute of Agricultural Economics, São Paulo, Brazil, Aricio X. Oliveira, SERFINA Economic Studies Centre, São Paulo, Brazil, and Nazira Gait, University of São Paulo, P.O. Box 20570, São Paulo, Brazil.

A VARMA modelling is applied to the following sets of data:
a) Average prices received by farmers for soybeans in the State of Sao Paulo;
b) Average cash price of no. 1 yellow soybeans at Chicago;
c) Average price of USA no. 2 soybeans at Rotterdam;
d) US commercial stocks of soybeans.

Dynamic and causal relationships, and forecasting, are discussed.

"BAYESIAN TRANSFER RESPONSE MODELS - AN APPLICATION TO THE BRAZILIAN INDUSTRIALIZED EXPORTS"
Helio S. Migon, Universidade Federal do Rio de Janeiro, Brazil.

This paper describes an application of the Bayesian Transfer Response Forecasting Models (Migon, 1984 and Migon and Harrison, 1985) to the prediction of the value of the Brazilian industrialized exports. Although the emphasis is on the application, a brief description of the Bayesian Method is presented.

A simultaneous equation model is developed for the supply and demand of industrialized goods. Using a logarithmic specification one can straightforward obtain the equation which represents the 'value of the exports', basically a function of the real exchange rate and the world income. The dynamic behaviour is introduced in ad hoc basis using an adaptive expectation hypothesis.

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To submit a paper contact: Robert L. Winkler, Fuqua School of Business, Duke University, Durham, North Carolina 27706
Phone: (919) 684-5375 Telex: 802 829

For exhibits contact: Hans Levenbach, Core Analytic, Inc., 674 Route 202-206 North, Bridgewater, New Jersey 08807
Phone: (201) 218-0900

For more information contact: J. Scott Armstrong, Wharton School, University of Pennsylvania, Philadelphia, Pennsylvania 19104
Phone: (215) 898-5087 Telex: 7106700328