**INTERNATIONAL ECONOMIC ASSOCIATION
CONFERENCE VOLUMES, Numbers 1-50**

NUMBER 38

**Methods of Long-Term Planning and
Forecasting**

Methods of Long-term Planning and Forecasting

Proceedings of a Conference held by the
International Economic Association
at Moscow

EDITED BY
T. S. KHACHATUROV

© International Economic Association 1976

Softcover reprint of the hardcover 1st edition 1976 978-0-333-18518-6

All rights reserved. No reproduction, copy or transmission of this publication may be made without written permission.

No paragraph of this publication may be reproduced, copied or transmitted save with written permission or in accordance with the provisions of the Copyright Act 1956 (as amended).

Any person who does any unauthorised act in relation to this publication may be liable to criminal prosecution and civil claims for damages.

First published 1976

This 50-volume set reprinted 1986 jointly by
THE MACMILLAN PRESS LTD
Houndmills, Basingstoke, Hampshire RG21 2XS
and London
Companies and representatives
throughout the world
and
YUSHODO CO. LTD
29 Saneicho, Shinjuku-ku
Tokyo 160 Japan. Tel: 03(357)1411

Published in the United States and Canada by
STOCKTON PRESS
15 East 26th Street, New York, N.Y. 10010

ISBN 978-1-349-02651-7 ISBN 978-1-349-02649-4 (eBook)
DOI 10.1007/978-1-349-02649-4

Contents

<i>Acknowledgements</i>	vii
<i>List of Participants</i>	ix
<i>Introductory Note</i> E. A. G. Robinson	xiii

PART ONE: GENERAL PROBLEMS OF LONG-TERM PLANNING

1	Methodological Problems of Socio-economic and Scientific-technological Forecasting in the U.S.S.R. <i>N. Fedorenko</i>	1
	Discussion	14
2	Thoughts on Planning in Western Economies <i>E. Malinvaud</i>	22
	Discussion	39

PART TWO: METHODS OF PLANNING AND FORECASTING IN THE U.S.S.R.

3	Growth Models and their Application to Long-term Planning and Forecasting <i>L. V. Kantorovitch and V. L. Makarov</i>	51
	Discussion	67
4	An Optimal Approach in Long-range Planning <i>A. Aganbegyan</i>	72
	Discussion	84

PART THREE: METHODS OF PLANNING AND FORECASTING IN OTHER CENTRALLY PLANNED ECONOMIES

5	The Basic Tasks and Functions of Long-term Planning in Poland <i>K. Porwit</i>	99
	Discussion	113
6	Long-term Overall Planning in Hungary <i>I. Hetényi</i>	120
	Discussion	136
7	Problems of Long-range Planning in Yugoslavia <i>R. Stojanović</i>	142
	Discussion	163
8	Some Problems of Long-term Forecasting of Living Standards in Yugoslavia <i>E. Berković</i>	171
	Discussion	185
9	Planning Development of Population and Manpower Resources in Bulgaria <i>D. Bradistilov</i>	191
	Discussion	204

10	Long-term Planning and Forecasting for Education in the German Democratic Republic	<i>H. Maier</i>	210
	Discussion		232

PART FOUR: LONG-TERM FORECASTING AND PLANNING IN OTHER ECONOMIES

11	Sources of Growth Accounting as the Basis for Long-term Projection in the United States	<i>E. F. Denison</i>	241
	Discussion		260
12	Prospects of Economic Growth in the Federal Republic of Germany	<i>G. Fels</i>	265
	Discussion		276
13	A Macro-programming Model for the Finnish Economy	<i>R. Hjerpppe</i>	282
	Discussion		299
14	Internal and External Aspects of Development Plans and Performance in Aid-receiving Countries	<i>H. B. Chenery and N. G. Carter</i>	303
	Discussion		331
15	Technological Forecasting	<i>E. Mansfield</i>	334
16	Problems Created by the Increasing Pace of Technical Progress	<i>H. Aujac</i>	350
	Discussion		358
17	Long-term Projections of Consumer Demand in the United Kingdom	<i>A. S. Deaton</i>	368
	Discussion		376
18	Long-term Projections of Household Consumption in France	<i>G. Vangrevelinghe</i>	382
	Discussion		391
19	Long-term Global Optimisation in Educational Planning	<i>C. C. von Weizsäcker</i>	396
	Discussion		409

PART FIVE: PLANNING IN A MARKET-ECONOMY CORPORATION

20	Business Planning and Forecasting in the United States from a Business Economist's Viewpoint	<i>D. L. Grove</i>	415
21	The Long-range Corporate Plan of a Private Business Enterprise in Japan	<i>M. Horimoto</i>	433
	Discussion		450
	<i>Index</i>		457

Acknowledgements

The International Economic Association wishes to express its great gratitude to the U.S.S.R. Academy of Sciences, whose generous grant paid all the local expenses of the conference here recorded as well as part or all of the costs of transportation of many of the participants from East European countries. For the transportation of the participants from the rest of the world the Association depended on the general grant provided to it for these and other purposes by the Ford Foundation, and to that Foundation it wishes, as so often in the past, to express its gratitude.

Apart from the help of those two great institutions, the Association has special reasons for gratitude to a number of individual persons in the U.S.S.R. who did more than we had any possible right to expect to make the conference a success. We would especially mention Academician Nikolay P. Fedorenko, Director of the Central Economic Mathematical Institute; Professor V. A. Vinogradov, Director of the Institute of Scientific Information on Social Sciences; Dr E. E. Filippovski, Scientific Secretary of the Association of Soviet Economic Scientific Institutions and his band of friendly and efficient helpers. But above all, we wish to thank Professor Tigran S. Khachaturov, who was architect of the conference and chairman of its programme committee, and whose indefatigable personal attention throughout assured its smooth running and very friendly atmosphere.

PROGRAMME COMMITTEE

T. S. Khachaturov (U.S.S.R.)
J. Pajestka (Poland)
J. Bénard (France)
H. B. Chenery (U.S.A.)
E. Jantsch (Federal Republic of Germany)

List of Participants

- Professor A. G. Aganbegyan (U.S.S.R.), Prospect of Science
Professor D. A. Allahverdian (U.S.S.R.), Institute of Economics, U.S.S.R. Academy of Sciences
Professor A. I. Anchiskin (U.S.S.R.), Central Economic Mathematical Institute, U.S.S.R. Academy of Sciences
Professor A. V. Anikin (U.S.S.R.), Institute of World Economy and International Relations, Moscow
Professor Augustinovich (Hungary), Planning Committee of the People's Republic of Hungary
Mr Henri Aujac (France), Bureau d'Information et de Prévisions Économiques, Neuilly sur Seine
Professor I. A. Bazhenov (U.S.S.R.), Urals Centre, U.S.S.R. Academy of Sciences
Professor Jean Bénard (France), CEPREMAP, Paris
Professor Eva Berković (Yugoslavia), Union of Economists of Yugoslavia
Professor D. Bradistilov (Bulgaria), Union of Economists of Bulgaria
Professor Bruno (Israel), Hebrew University, Jerusalem
Professor H. B. Chenery (U.S.A.), International Bank for Reconstruction and Development, Washington, D.C.
Mr N. Ciulei (Roumania), Economic Planning Committee of Socialist Republic of Roumania
Mr Angus Deaton (U.K.), Department of Applied Economics, Cambridge
Professor E. Denison (U.S.A.), The Brookings Institution, Washington, D.C.
Professor M. Drăgan (Roumania), Economic Planning Committee of Socialist Republic of Roumania
Gordana Draghichevitch (Yugoslavia), Beograd
Professor Entov (U.S.S.R.), Institute of World Economy and International Relations, U.S.S.R. Academy of Sciences
Professor N. P. Fedorenko (U.S.S.R.), Director, Central Economic Mathematical Institute, U.S.S.R. Academy of Sciences
Dr Gerhard Fels (F.R.G.), Institut für Weltwirtschaft, Universität Kiel
Dr E. E. Filippovski (U.S.S.R.), Scientific Secretary, Association of Soviet Economic Scientific Institutions, Moscow
Professor B. Fritsch (Switzerland), Centre of Economic Research, Zürich
Professor E. I. Gromov (U.S.S.R.), Institute of World Economy and International Relations, U.S.S.R. Academy of Sciences
Dr David Grove (U.S.A.), Economist and Vice-President, International Business Machines Corporation, Armonk, N.Y.
Professor F. G. Gurvitch (U.S.S.R.), *Economic Mathematical Methods*, Moscow
Professor I. Hetényi (Hungary), National Planning Office, Budapest
Mr Reino Hjerpe (Finland), Central Statistical Office of Finland
Mr M. Horimoto (Japan), Economic and Business Survey Department, Sumitomo Chemical Company, Osaka
Professor N. V. Hristova (U.S.S.R.), International Institute of Economic Problems of the World Socialist System, Council for Economic Assistance, Moscow
Mr E. John (Hungary), Economic Planning Committee of the People's Republic of Hungary
Professor L. V. Kantorovitch (U.S.S.R.), Institute of Management, U.S.S.R. Academy of Sciences

- Professor T. S. Khachaturov (U.S.S.R.), Chairman of the Presidium, Association of Soviet Economic Scientific Institutions
- Professor G. A. Kozlov (U.S.S.R.), Academy of Social Sciences, Moscow
- Professor V. P. Krasovski (U.S.S.R.), Institute of Economics, U.S.S.R. Academy of Sciences
- Professor U. R. Leibkind (U.S.S.R.), Central Economic Mathematical Institute, U.S.S.R. Academy of Sciences
- Professor H. Lindner (G.D.R.), Institute of Scientific Research, Ministry of Science and Technology, Berlin
- Professor F. Machlup (U.S.A.), President, International Economic Association, Princeton University, Princeton, New Jersey
- Professor H. Maier (G.D.R.), Central Economic Institute, Academy of Sciences
- Professor V. F. Maier (U.S.S.R.), Economic Institute of Scientific Research, Economic Planning Committee, Moscow
- Professor E. Z. Majminas (U.S.S.R.), Central Economic Mathematical Institute, U.S.S.R. Academy of Sciences
- Professor V. L. Makarov (U.S.S.R.), Siberian Department of the U.S.S.R. Academy of Sciences, Novosibirsk
- Professor E. Malinvaud (France), Direction de la Prevision, Ministère de l'Economie et des Finances, Paris
- Professor E. Mansfield (U.S.A.), Wharton School of Finance and Commerce, University of Pennsylvania, Philadelphia, Pennsylvania
- Professor J. Marczewski (France), The University of Sorbonne, Paris
- Professor V. A. Martinov (U.S.S.R.), Institute of World Economy and International Relations, U.S.S.R. Academy of Sciences
- Professor F. M. Metelski (U.S.S.R.), International Institute for the Economic Problems of the World Socialist System, Council for Economic Assistance, Moscow
- Professor N. K. Moiseev (U.S.S.R.), U.S.S.R. Academy of Sciences
- Professor H. Nick (G.D.R.), Institute of Social Sciences, Central Committee of the G.D.R.
- Professor Fred Oelssner (G.D.R.), Academy of Sciences
- Professor K. Porwit (Poland), Institut Planowania, Warsaw
- Professor A. A. Rivkin (U.S.S.R.), Institute of World Economy and International Relations, U.S.S.R. Academy of Sciences
- Professor D. V. Rjabushkin (U.S.S.R.), Central Economic Mathematical Institute, U.S.S.R. Academy of Sciences
- Professor E. A. G. Robinson (U.K.), General Editor of I.E.A. publications, University of Cambridge
- Professor A. M. Rumjantsev (U.S.S.R.), Presidium of the U.S.S.R. Academy of Sciences
- Professor V. I. Sedov (U.S.S.R.), Institute of World Economics and International Relations, U.S.S.R. Academy of Sciences
- Professor S. S. Shatalin (U.S.S.R.), Central Economic Mathematical Institute, U.S.S.R. Academy of Sciences
- Professor D. Shimon (U.S.S.R.), International Institute of Economic Problems of the World Socialist System, Council for Economic Assistance, Moscow
- Professor G. M. Sorokin (U.S.S.R.), Institute of Economics, U.S.S.R. Academy of Sciences
- Professor Radmila Stojanović (Yugoslavia), Union of Economists of Yugoslavia
- Mr M. Stuparu (Roumania), Scientific Research Institute, Economic Planning Committee, Roumania
- Mr G. Szepesi (Hungary), Planning Committee of Hungary

List of Participants

xi

Professor A. S. Tolkachev (U.S.S.R.), Economic Institute of Scientific Research,
Economic Planning Committee, Moscow

Mr E. V. Topala (Roumania), Scientific Research Institute, Economic Planning
Committee of Roumania

Mr G. Vangrevelinghe (France), Institut National de la Statistique et de les Études
Economiques, Paris

Dr N. Velikov (Bulgaria), Union of Economists of Bulgaria

Professor V. A. Vinogradov (U.S.S.R.), Director, Institute of Scientific Information
on Social Sciences, U.S.S.R. Academy of Sciences

Professor V. A. Volkonski (U.S.S.R.), Central Economic Scientific Mathematical
Institute, U.S.S.R. Academy of Sciences

Professor C. C. von Weizsäcker (F.R.G.), Institute of Mathematical Economics,
Universität Bielefeld

Professor Yershov (U.S.S.R.), Central Economic Mathematical Institute, U.S.S.R.
Academy of Sciences

Secretariat

Miss Mary Crook, Administrative Secretary, I.E.A., Paris

Miss Tanya Dyomina, Administrative Secretary, Association of Soviet Economic
Scientific Institutions

Professor L. Fauvel, General Secretary, I.E.A., Paris

Dr E. E. Filippovski, Scientific Secretary, Association of Soviet Economic Scientific
Institutions

Mrs Galina Modina, Central Economic Mathematical Institute, U.S.S.R. Academy
of Sciences

Introductory Note

E. A. G. Robinson

EDITOR OF INTERNATIONAL ECONOMIC ASSOCIATION PUBLICATIONS

This was the first time that a conference of the International Economic Association had been held in the Soviet Union, and the I.E.A. owes a special debt of gratitude to Professor Tigran S. Khachaturov, whose name as the architect of the conference and chairman of the programme committee rightly stands on the title page. He was helped in the preparation of the scientific programme of the meeting by a committee consisting of Professor Jean Bnard, Professor Hollis Chenery, Professor Erick Jantsch and Professor Josef Pajestka.

For many of us who took part in the conference, one of the most interesting features of it was the vigorous exchange of ideas and the discussions and criticisms of each others' procedures among the participants from the different socialist countries, and at the same time the friendly good temper which throughout animated all our discussions, formal and informal, in the huge Hotel Ukrania in which we lived, conferred, ate and argued in warmth and comfort that contrasted with the outside conditions of a Moscow December.

The conference worked in two languages, English and Russian. For the papers by non-socialist authors an original English text was, of course, available. For the papers by socialist authors the English text had in all cases been prepared by translators in the countries of the authors concerned. Some of these translations were lucid and are published almost as they stood. A few of the translations were, on the other hand, somewhat obscure and involved a certain amount of guess-work before the author's meaning could be surmised. It has been my task as editor of all the publications of the International Economic Association to produce texts which a reader can understand without a similar effort of his own and which reach the standards of readable English very reasonably required by our publishers. I have confined my tasks as editor to that sole objective, excluding nothing. I have not abbreviated, because I did not want to alter the balance of the author's presentation. If I have anywhere failed to discover and bring out the author's own intended meaning, I apologise in advance.

Hardly any of us who came from the non-socialist countries knew more than a few words of Russian. Thus the conference was more

than ordinarily dependent on the simultaneous translation in one direction or the other, and in our case particularly on that from Russian to English. The fact that Russian was extensively used, and that the summary of the discussion had to be compiled from an English translation of the Russian shorthand record, has made the task of editing this volume somewhat more arduous than usual.

Now that I am able to read the revised summaries of what was said in the discussions, I realise that on a number of occasions we may have failed to take in fully some of the more sophisticated arguments of our socialist colleagues and that we may have sometimes seemed to them to have failed to pick up and to reply to their points. For that I think we owe them some apology. This has emphasised again – in spite of the excellent performance of the interpreters in Moscow – the extent to which an effective international meeting of minds depends not only on the skill and technical knowledge of those who are responsible for these very difficult and onerous tasks of interpretation but also on the opportunity given to participants to reflect on the arguments put forward in the sessions. I trust that the summary of the discussions in the present volume will contribute to this better understanding which was our aim.