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THE WORLD BANK
Washington, D.C.

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INDUSTRIAL DEVELOPMENT &
TRADE PANEL
Meeting July 1978



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PROGRAM

MEETING SCHEDULE FOR INDUSTRIAL DEVELOPMENT
AND TRADE PANEL

Monday, July 17

9:00 - 9:30 Assemble in Mr. Balassa's Office (K3411).

9:30 - 10:30 Meeting with Messrs. Balassa, Westphal,
[K-3700] Wood, Waide, Bery, Gelb for formal welcome
and discussion of program.

10:30 - 12:00 Review documents

12:00 Meeting with Messrs. Chenery
[E1239] and Karaosmanoglu.

1:00 Lunch - Executive Dining Room E (Room One).

2:30 Meeting with Internal Steering Group on
[D-958] Industrial Development and Trade.
Membership: Messrs. Gordon, Waide,
Gulhati, Richardson, Fuchs, Westphal,
Moore, Balassa.

4:00 Meeting with IDF Department (Mr. Gordon
[D-958] and Staff).

6:00 - 8:00 Cocktail hosted by Mr. Gordon
(Dining Room D).

Tuesday, July 18

9:15 Meeting with Trade Steering Group.
[K-3700] Membership: Messrs. Balassa, I. Frank,
D. Keesing, P. Streeten, H. Hughes,
S. Singh.

10:30 Meeting with Development Economics
[K-3700] Department - Mr. Stoutjesdijk

~~11:45 Meeting with East Asia and Pacific
[D-958] Region (Mr. Hawkins and Staff).~~

1:00 Lunch with Mr. Balassa (Executive Dining
Room E - Room Five).

2:15 Meeting with Industrial Projects Depart-
[D-958] ment (Mr. Fuchs and Staff).

Thursday, July 20

a.m. Available for meetings and/or panel discussions.

Lunch Free

3:00 Meeting with Latin America and Caribbean
[K3700] Region (Mr. Paul Meo and Staff).

7:30 Dinner with Mr. Balassa at the Empress
Restaurant David Lee's on 1875 Connecticut
Avenue, N.W. (462-8110)

Friday, July 21

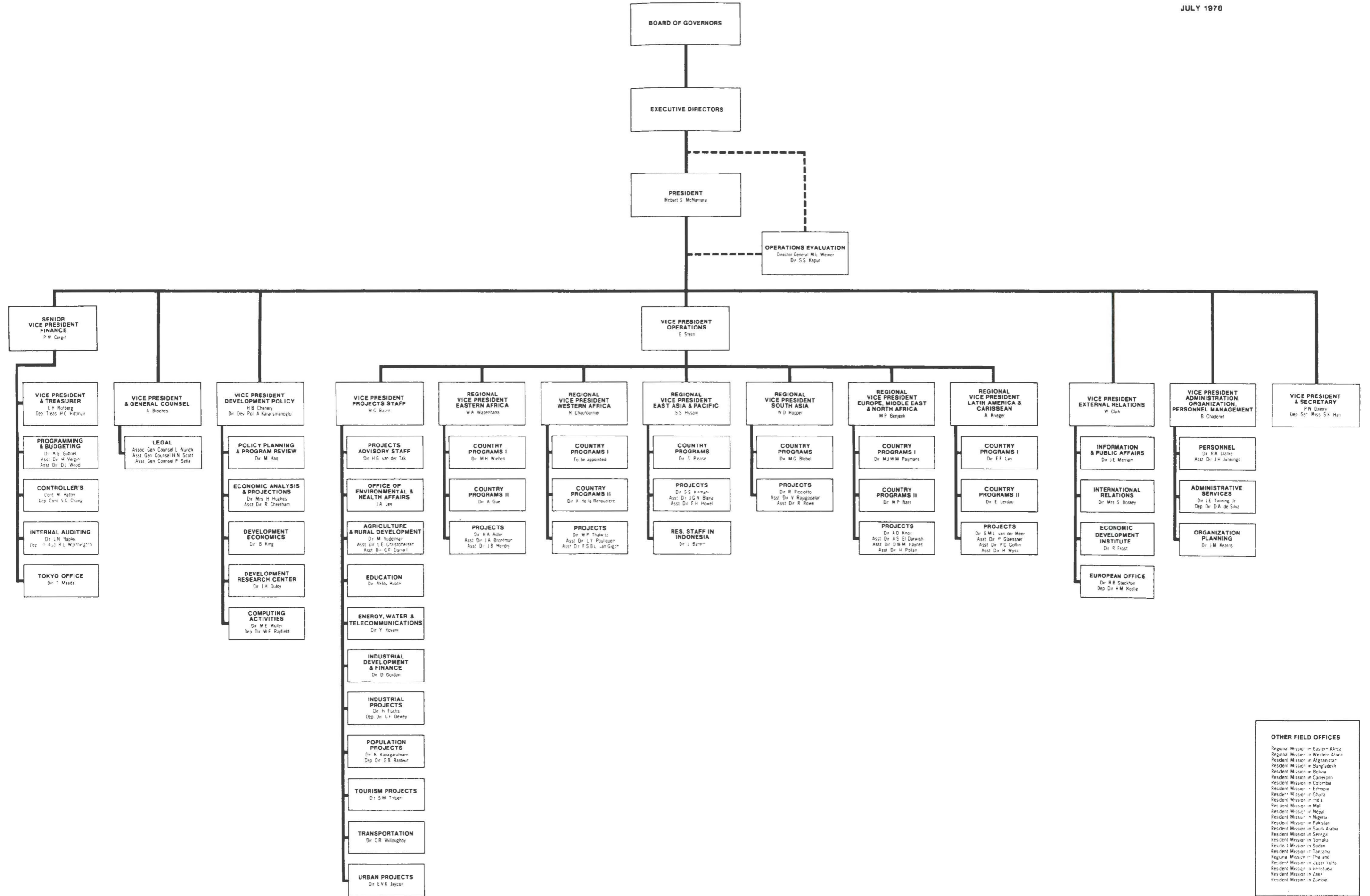
9:00 Meeting with IFC [Development Dept.]
[K-3700] (Mr. Richardson and Staff).

12:00 Meeting with Messrs. Chenery, Balassa,
[E1208] Waide, Westphal, Bery, Gelb, Wood

12:30 Lunch in Executive Dining Room E
Room 3 (Present at lunch: Messrs. Wood,
Waide, Westphal, Balassa, Bery, Gelb)

p.m. Available for meetings and/or panel
discussions.

WORLD BANK
INFORMATION



- OTHER FIELD OFFICES**
- Regional Mission in Eastern Africa
 - Regional Mission in Western Africa
 - Resident Mission in Afghanistan
 - Resident Mission in Bangladesh
 - Resident Mission in Bolivia
 - Resident Mission in Cameroon
 - Resident Mission in Colombia
 - Resident Mission in Ethiopia
 - Resident Mission in Ghana
 - Resident Mission in India
 - Resident Mission in Mali
 - Resident Mission in Nepal
 - Resident Mission in Nigeria
 - Resident Mission in Pakistan
 - Resident Mission in Saudi Arabia
 - Resident Mission in Senegal
 - Resident Mission in Somalia
 - Resident Mission in Sudan
 - Resident Mission in Tanzania
 - Regional Mission in Thailand
 - Resident Mission in Upper Volta
 - Resident Mission in Venezuela
 - Resident Mission in Zaire
 - Resident Mission in Zomba

INDUSTRIAL DEVELOPMENT AND TRADE STEERING GROUP

B. Waide, Chief Economist	ASNVP	72397	A513
R. Richardson, Director	CDD	75768	C1204
H. Fuchs, Director	IPD	76165	D529
L. Westphal, Div. Chief,	DEDND	61213	K4209
F. Moore,	IDF	74072	D422
B. Balassa, Act. Res. Advisor	VPD	61998	K3411
R. Gulhati, Chief Economist	EANVP	73448	A1136
D. Gordon, Director	<i>IDP</i> DFE	74111	D428

TRADE STEERING GROUP (DPS) *Production*

Bela Balassa	DRC	61998	K3411
Isaiah Frank	CON	61892	K5505 (785-6261)
Don Keesing	DEDND	61221	K4202
Paul Streeten	PPR	74544	D446
Helen Hughes	EPD	61811	K5100
Shamsher Singh	CE	60049	K3000

Office of the Director (700-05) CADD

Name	Ext.	Room	Home No.
Muller M.E.	61501	N 935	229-4226
Rayfield W.F.	61550	N 935	759-3119
Schaech J.A.	61553	N 935	552-3315

Software Systems (700-10) CADSS

Alexander F.L.	61544	N 160	281-9759
Buck W.	61544	N 151	560-8719
Conrad H.G.	61544	N 148	774-6070
Heintachel T.J.	61544	N 146	530-5674
Kumsher E.	61544	N 152	248-4369
Summers S.S.	61544	N 151	262-7773

ECONOMIC ANALYSIS & PROJECTIONS DEPT. (625) EPD

Office of the Director (625-05) EPDDR

Name	Ext.	Room	Home No.
Hughes H.	61811	K5100	
Cheatham R.	61813	K5102	
Aggarwal H.	61893	K5504	
Baldwin R.**	61824	K5110	
Dailly J-P.	61892	K5503	
Hidalgo-Gato M.	61815	K5105	652-6895
Gupta S.	61817	K5107	656-3111
McPhenters R.	61821	K5108	924-2253
Saxe J.	61816	K5106	337-2517

File Processing Services I (700-15) CADFI

Wahl W.	61725	N1025	977-8760
Abellon E.M.	61685	N1021	881-6410
Barkley S.	60098	N1014	
Pan H.	61742	N1026	333-0359
Peterson H.J.	61683	N1016	(301) 263-3728
Thananart N.	61686	N1015	569-0214
Vasquez C.	61741	N1023	820-8056

File Processing Services II (700-17) CADF2

Shapiro A.F.	61731	N1044	340-2303
Jahr K.	61735	N1056	354-2116
Byrne K.	61739	N1063	464-0574
Claude R.	61727	N1038	840-1452
Cowsett H.	61732	N1047	154-1521
Krueger K.H.	61730	N1049	534-4375
Miholen S.	61735	N1058	897-8472
O'Donnell M.E.	61727	N1032	474-4398
Quiroga T.	61727	N1033	931-4612
Salientes R.	61735	N1054	460-3619
Schneider H.	61727	N1035	569-4620
Sheehan J.K.	61730	N1040	937-7112
Talero E.	61739	N1062	751-9464

Analytical Services (700-20) CADAS

Owens M.	61719	N 924	299-9237
Arendal P.	61708	N 904	354-4048
Barger R.	61683	N1010	384-8507
Bartlett M.	61721	N1002	521-3122
Condliffe S.	61717	N 927	462-7675
Donahue R.	61716	N 921	528-6115
Guterman P.	61716	N 925	332-8574
Hamsher P.	61716	N 923	965-9531
Heiler S.I.	61683	N1011	299-3106
Hoyle D.	61712	N 910	281-4321
Huang M.	61723	N1008	893-1002
Kanemasu H.	61708	N 908	965-4798
Krauser J.	61716	N 918	280-5507
Lewin H.	61723	N1006	223-4161
Minich G.M.	61712	N 914	893-4849
Mousaa A.	61708	N 907	299-2459
OGawa T.	61712	N 911	379-2614
Ramiscal E.R.	61712	N 915	590-4267
Roizen P.	61712	N 917	(703) 532-3509
Sahasrabudhe V.	61708	N 903	750-1120
Schneider H.H.	61721	N1004	299-3046

User Services (700-25) CADUS

West G.W.	61559	N 943	337-0806
Browne S.	61701	N 960	892-6058
Comer E.C.	61735	N1052	363-2454
Connolly R.	61705	N 952	524-3338
Delmonte D.	61701	N 958	462-3194
Hsueh P.	61693	N 948	299-8491
Ikrumulah K.M.	61693	N 944	986-0612
Jordan C.	61701	N 954	941-5766
McConnell R.E.	61705	N 953	261-3094
Moses D.	61701	N 951	270-1117
Powell R.O.	61705	N 955	494-8985
Rix D.	61701	N 946	590-1719
Schafroth N.	61701	N 955	920-8368
Steinberg L.	61693	N 963	530-6483
Tucker R.	61727	N1030	820-3116

Joint Computer Center (700-30) CADJC

Sanchez F.	75188	C 404***	976-3084
Bonoxey D.	73300	C 404***	926-0270

Data Processing Services (700-35) CADDP

Erickson W.R.	73818	C 404***	356-6666
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Data Preparation & Unit Record (700-70) DP

Palmer R.W.	75478	A 137	577-2705
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Direct-In-Dial Numbers:
477-XXXX or 676-XXXX

DEVELOPMENT POLICY STAFF

OFFICE OF THE VICE PRESIDENT (600-99)

Name	Ext.	Room	Home No.
Chenery H.B.	73665	E1739	338-4724
Karacomanoglu A.	75451	E1243	229-4584
Wright P.	78014	F1222	
Bery S.	76003	F1233	
Chokai A.M.	61604	N 312	363-2881
Cleave L.	75253	E1243	965-3016
Weaving R.	75078	F1219	

DEVELOPMENT ECONOMICS DEPT. (610)

Office of the Director (610-05) DEDDR

Name	Ext.	Room	Home No.
King B.B.	61001	K4000	333-8727
Stoutjesdijk E.	61003	K4002	244-6809
Reutlinger S.	61006	K4005	649-4033
Lowther J.	61005	K4004	560-8933

Economics of Industry (610-10) DEDND

Westphal L.	61213	K4209	768-1279
Cortez M.	61220	K4203	
Dervis K.	61241	K4308	
Kawaguchi Y.	61217	K4206	920-3937
Keening D.	61221	K4202	363-3511
Rubo Y.	61219	K4204	820-0183
Papageorgiou D.	61216	K4207	945-1528
Prakash V.	61223	K4200	365-2549
Rhee Y.	61222	K4201	299-4655
Robinson S.	61215	K4208	

Urban & Regional Economics (610-20) DEDRB

Keare D.	61271	K4605	320-4077
Fernandez-Palacios M.*	61284	K4609	
Ingram G.	61275	K4602	
Lee K.S.	61283	K4608	
Mohan R.	61274	K4603	
Renaud B.	61282	K4607	524-5698
Sant'Anna A.	61281	K4606	726-7610

Population & Human Resources (610-40) DEDPH

King T.	61251	K4406	857-9203
Chernichovsky D.	61265	K4404	565-2314
Cochrane S.	61253	K4407	836-7481
Faruque R.	61262	K4401	229-6597
Jamison D.	61261	K4400	244-0092
Mescock O.	61266	K4405	
Moran R.	61264	K4403	243-2915
Shields N.G.	61263	K4402	365-0648
Tachariah K.	61254	K4408	530-7280

Employment & Rural Development (610-60) DEDER

Leiserson M.	61231	K4300	941-6848
Anderson D.	61236	K4304	320-4629
Bhalla S.	61234	K4302	
Bose S.	61233	K4301	229-6068
Mazumdar D.	61238	K4306	
Sabot R.	61237	K4305	244-5611
Singh I.	61239	K4307	765-0261
Webb R.	61235	K4303	

Public Finance (610-70) DEDPF

Bhatt V.	61031	K4100	229-8450
Dellalifar W.	61036	K4104	
Kee W.S.	61045	K4106	455-3286
Meerman J.	61034	K4102	686-6621
Nankani G.	61033	K4101	
Yusuf S.	61035	K4103	338-0691

*Young Professional
**Consultant
***In the Fund Building

DEVELOPMENT RESEARCH CENTER (650)

Office of the Director (650-05) DRCDR

Name	Ext.	Room	Home No.
DuLoy J.E.	61967	K3403	244-6390
Pyatt G.	60021	K3600	299-4272
Balassa B.	61998	K3411	265-0539
Srinivasan T.N.	61969	K3402	588-9262
Stout G.	61993	K3406	654-2684

Income Distribution (650-10) DRCID

Ahluwalia M.	60001	K3504	657-2673
Bell C.	61970	K3401	244-0033
Blaschop J.	61974	K3305	966-5019
Braverman A.	60014	K3500	
Luch C.	60011	K3502	527-4158
Minhas B. **	61973	K3306	
Selowsky M.	60012	K3501	654-6996
Visaria P.	61972	K3400	652-5589

Development Planning (650-20) DRCDP

Worton R.	60019	K3601	363-7882
Blitser C.	60018	K3604	656-1976
Feder G.	60015	K3607	
Plassner Y. **	60016	K3606	
Purcell G.	60017	K3605	652-8534

Special Topics (650-30) DRCSST

Candler W.	61980	K3300	(301) 757-5626
Hassell P.	61979	K3301	
Kutcher G.	61978	K3302	279-0144
Meeraus A.	61975	K3304	667-3419
O'Mara G.	61977	K3303	299-3946
Townsend R. **	60010	K3503	

POLICY PLANNING & PROGRAM REVIEW (630) PPR

Name	Ext.	Room	Home No.
Haq M.	60121	I 605	
Chernick S.	60123	I 608	652-3139
Streeten P.	60125	I 602	333-1046

Policy Planning (630-10) PPRPP

Burki S.	60133	I 615	340-7642
Beenstock M.	60129	I 611	
Brown G.	60128	I 610	536-8691
Hicks N.	60132	I 614	
Hofmeister R.	60131	I 613	229-6341
Simmons J.	60127	I 609	(413) 549-6882
Thalwitz M. *	60145	I 629	

Program Review (630-20) PPRPR

Duvaux M.	60139	I 622	229-1289
Berdouk H.	60144	I 627	370-4222
Edelman J.	60135	I 616	765-0369
Isenman P.	60138	I 621	
Landell-Mills P.	60143	I 626	966-8947
McGibbon J.	60141	I 624	
Rao B.	60140	I 623	363-7094
Vandendries R.	60142	I 625	
Yang S.C.	60137	I 620	320-5478

EXTERNAL
RES. PROG.

Table 2: Outlays under the External Research Program, by Functional Category; FY73 to FY78
(Percentages)

<u>Category</u>	<u>FY73</u>	<u>FY74</u>	<u>FY75</u>	<u>FY76</u>	<u>FY77</u>	<u>FY78</u>	<u>FY73-FY78 Total</u>
I. Development Policy & Planning							
A. General Planning	7.3	0.5	-	-	-	-	1.1
E. Income Distribution	7.2	16.3	18.8	16.6	5.8	2.6	10.5
C. Growth/Country Analysis	16.2	11.8	8.3	16.7	18.0	14.2	13.9
Total Section I	30.7	28.6	27.1	33.3	23.8	16.8	25.5
II. International Trade & Finance	1.0	2.9	2.5	7.3	8.4	6.7	5.1
III. Agriculture & Rural Development	18.0	16.6	17.2	11.6	24.7	18.9	17.9
IV. Industry	5.9	13.0	6.0	6.8	4.9	8.7	7.5
V. Transportation	25.1	12.5	16.3	11.1	12.2	4.9	12.5
VI. Public Utilities	8.3	7.4	4.2	1.8	11.4	13.2	8.1
VII. Urbanization and Regional Development	3.3	4.4	10.8	8.4	3.2	10.4	7.1
VIII. Population & Human Resources							
A. Education	2.7	3.8	3.6	2.6	2.5	7.4	4.5
B. Labor and Employment	4.4	8.8	8.8	10.9	3.4	6.3	7.2
C. Population and Health	0.4	0.8	3.0	6.1	4.5	6.9	4.0
Total Section VIII	7.5	13.4	15.4	19.6	10.4	20.6	15.7
IX. Other	-	1.2	0.5	-	1.0	-	0.6
GRAND TOTAL	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>

Source: (Table 1)

International Bank for Reconstruction and Development
International Development Association

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MEETING

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WBG ARCHIVES

For consideration on
March 7, 1978

R78-18/2
IDA/R78-11/2

FROM: Vice President and Secretary

March 2, 1978

WORLD BANK RESEARCH PROGRAM

Supplementary Statement

The attached supplementary statement dated February 9, 1978 on the World Bank Research Program was considered by the Joint Audit Committee on February 27, 1978. The Committee recommended that the statement be sent to the Executive Directors in connection with the President's Memorandum and Report on the Bank Group Research Program (R78-18[IDA/R78-11]) distributed on January 30, 1978. Attached also is an annex entitled "Country Reference and Collaborating Institutions: Research Proposals Approved in FY77 and FY78."

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OFFICE MEMORANDUM

TO: The Joint Audit Committee
FROM: A. Karaosmanoglu, Dir., Development Policy *AK*
SUBJECT: World Bank Research Program DATE: February 9, 1978

1. At its meeting on February 2, 1978, the Joint Audit Committee requested a supplementary note on certain questions raised at its meeting on January 28, 1977 and at the meetings of the Executive Directors on February 15 and February 17, 1977, which were not explicitly referred to in this year's Annual Report on Research. The questions were related to the following areas:

- Objectives of the Research Program;
- The level of Resources Related to Research;
- Research Priorities;
- Dissemination.

These are addressed in the remainder of this note. Since research in the Bank is discretionary in character, it is impossible to avoid a substantial element of judgment in deciding its level and composition; consequently, answers to some of the questions cannot be definitive.

I. Objectives

2. In the first annual report to the Board ^{1/} four objectives were identified for the Research Program:

- To support all aspects of Bank operations, including the assessment of development progress in member countries;
- To broaden our understanding of the development process;
- To improve the Bank's capacity to give policy advice to its members;
- To assist in developing indigenous research capacity in member countries.

^{1/} Bank Group Research Program (R73-257, November 12, 1973).

At the meeting of the Joint Audit Committee on January 28, 1977, the conclusion was reached that "it might be useful to review the adequacy of the four major objectives (Report, p. 5) of the Bank's Research Program."^{1/} These four objectives are rather general in nature, and it may be useful to describe how they have been interpreted in practice.

3. The great majority of proposals submitted to the Research Committee are intended to be responsive to the needs of the Bank in some aspect of its activities. The latter may range from specific sectoral concerns (e.g., utility pricing and investment policy), which are closely connected with lending, to questions of a broader character, in such fields as income distribution. The panels, which review these proposals before submission to the Research Committee, are asked to identify the use of the particular research being proposed either to the Bank or to its member governments. The panel membership is drawn from all parts of the Bank with the majority frequently coming from the operational departments.

4. Thus, the majority of research proposals correspond to the first and third objectives, support of Bank operations and improvement of the Bank's capacity to give policy advice. There are some research projects which correspond to the second objective, the broadening of understanding of the development process, for example, the Project on Patterns of Industrial Development (671-05). However, because of the frequent expressions of interest by the Executive Directors as well as the operational staff in research of more direct operational relevance, they remain a small minority. In practice, the conclusion has been reached that there should be a mix, but the proportion should be weighted on the side of operational or policy concern. Research into the development process itself is undertaken, whenever the Bank sees a need for a pioneering effort that is unlikely to be undertaken elsewhere. It is always possible that a project which is initially seen as non-operational, takes on a different significance with time. For example, the International Comparison Project, when first undertaken, may not have had so clear a significance for aid allocation as it has now.

5. When research projects are proposed, the question of collaboration with outside researchers is routinely raised. Preference is given to collaboration with developing countries' institutions, and special reasons have to be adduced if collaboration with a developed country institution is being proposed. However, collaboration with developing country institutions is considered, at present, to be a desirable by-product of the research to be undertaken rather than a principal objective. It would require a change in direction in the Bank's research program and probably a sizeable addition to resources to make the building up of

^{1/} Minutes of Meeting of the Joint Audit Committee (JAC/M 77-3).

research institutions in developing countries a primary objective in the way that the International Development Research Centre in Ottawa, for example, does.

II. The Level of Resources Devoted to Research

6. The Joint Audit Committee at its meeting of January 28, 1977 expressed its concern that "suitable guidelines were needed to determine the amount of research to be carried out by the Bank." Similar views were expressed at the meetings of the Executive Directors on February 15 and February 17, 1977. In the event, the establishment of such guidelines has proved elusive. In the first place, the Bank is a unique institution, and there is no basis for a suitable comparison with other institutions.

7. It would appear that the appropriate way to reach a judgment* on the proper level is to proceed incrementally rather than by aiming at comprehensive guidelines. The activities that are subsumed under the single heading of research are very varied. The decision whether the resources devoted to any single sub-category should be increased or decreased has to be weighed against the alternative uses of resources, not only under the heading of research, but also under other headings. It is very doubtful whether a single formula could be found to embrace the corpus of all these judgments.

8. This is, in fact, what has been done in practice. To the extent that the research program has appeared to be unsatisfactory, efforts have been made to reform it. At the present time, the improvement of dissemination has become an important issue, as noted in this year's Annual Report (paragraph 1.8) and in the subsequent section IV of this note. If the capacity of potential users to assimilate the output of research is seen as a bottleneck, the appropriate remedy may be either to alter the shape of the program making it more easily assimilable, or to spend more on promotion and application, since the line between research and teaching people to use research by demonstrating its application is a fine one. Once the program is regarded as fully satisfactory and there is an unsatisfied demand for its output, there may be a case for increasing the resources devoted to it, even in the face of competing demand from other activities.

9. There is, moreover, certain kinds of research-related activity not now undertaken. For example, the Bank has only marginally entered the field of primary data collection, and useful research in many countries is severely limited by lack of data. In most cases the Bank now relies on data collected routinely or ad hoc by others. This, of course, is one of the reasons why the Bank's research tends to be rather country-concentrated. Primary data collection covers a wide range from improved data on income distribution to more specific field work on projects. In either case, if carried out on any scale, it

would be expensive in both external costs and, if assembled and prepared for analysis, in staff time. A decision for or against such an activity would clearly make a substantial difference to the preferred level of resources. In a similar category is the support of developing country research institutions with the primary objective of building up their capacity rather than the joint undertaking of projects of mutual interest (referred to in Section I on Objectives). The Panel, which will shortly report on the Bank's program of research in Income Distribution and Employment, is expected to address itself to the questions of data collection and institution building.

10. In light of these considerations, it was decided that, until major reviews of the various categories of research had been completed (through various kinds of panels), it would be difficult to set forth a comprehensive account of the kinds of decisions that may have to be made, much less a rationale for an overall level. This may take two or more years, for reasons stated in Section III on Priorities. In the interim, an internal review by the Research Committee was undertaken in order to form a short-run view of required resources, pending the formulation of a longer-term view. The result of this assessment is that additional external resources for research cannot be justified in the short-run, because the additional staff required to complement these resources would not be available.

11. It seems likely that in the long run the size of the program can best be judged by its success. Within very wide levels one can say that it is too small if it is proving more useful at the margin than other activities--and vice versa. The long-run limitations may well be manageability of the program and capacity of potential users to assimilate its output.

III. Priorities

12. Last year's Annual Report on Research stated the intention to undertake the first of a series of reviews by outside panels of research on particular subjects or groups of subjects. 1/ It was hoped that, once a number of such reviews of this kind, covering the bulk of the research topics, had been undertaken, the basis would exist for an overall assessment of the program as a whole and for the determination of priorities for future work. During 1977, the first such panel was appointed as noted in this year's report on research. 2/ In the meeting on February 15, 1977, when last year's report was discussed, some Executive Directors expressed the view that an external panel to review all research would be desirable.

1/ World Bank Research Program, January 13, 1977, paragraph 1.33.

2/ World Bank Research Program, January 23, 1978, paragraph 1.11.

13. The merits of the two possible courses of action, immediate appointment of an overall external panel or deferment of consideration of priorities until a number of sectoral panels have reported, were carefully considered. The latter course was finally chosen because a review of all the Bank's research activities, an assessment of their relationship to the Bank's operations and other activities and the formulation of recommendations for future priorities across the board would be an extremely demanding task. It seemed out of the question that highly qualified people would be available to undertake such a task for the length of time required to do it justice in the absence of prior sectoral reviews.

14. It was, therefore, decided that it would be best to undertake the sectoral reviews first. Moreover, by adopting this course, advantage can be taken of panel reviews of all Bank activities in a sector, including research, such as that already undertaken on population and that now being started on education. The report of the panel on income distribution and employment, which has been somewhat delayed by adventitious circumstances, is now expected in the latter part of March. While primarily concerned with the particular subjects under review, it is expected that some of the broader issues affecting all research will be raised in that context.

15. As pointed out in this year's report (paragraph 1.12), other panels are under consideration. The timing and scope will depend on a variety of factors. For example, the stage which research on a particular subject has reached is an important factor. In the field of urbanization, for example, even the initial results of major research under way will not be available for at least two years. It will not, of course, be absolutely necessary to complete a full cycle of reviews before undertaking an overall assessment of priorities, but it should certainly make the task more manageable, if the greater part of the research has been covered by sectoral reviews.

IV. Dissemination

16. The Board and the Joint Audit Committee have expressed concern that insufficient attention may be being paid to the dissemination of the results of research work. This concern is shared by many staff members, including those most concerned with research and with publications.

17. A necessary but not sufficient factor in dissemination is the intrinsic interest and relevance of the work. But even where this is unquestionable, its influence may be less than it should be if the channels of communication are inadequate, or if the addressee does not have the time to absorb or use it.

18. The kind of dissemination needed varies very much with the end-product of research. Much of it is sufficiently and properly conveyed by being made available in the form of Working Papers, articles in learned journals, or books, supplemented in some cases by the author's participation in seminars or conferences. Since most addressees of development literature are busy, it is very important that publications should be reasonably terse in themselves, or at least have a concise introductory statement which says in plain language what the report is about and what its main conclusions are. Authors and editors need always to strive for improvement in this respect. So far as external publications are concerned, the Information and Public Affairs Department has issued guidelines for the preparation of manuscripts.

19. Of course, potential users must also be aware of the publications. Many thousands of copies of the Bank's catalogue are put out for the benefit of external users. In addition, there are nearly 300 depository libraries in developing countries, which receive all issued material free. But, so far as books are concerned, the commercial publishers also have an important role to play. Although these may not be as active as could be desired, the case for the Bank doing its own publishing has yet to be established.

20. It is not felt that lack of awareness is the problem so far as Bank staff are concerned. The time of the staff, and the operational relevance of the material, are the governing factors. It should also be noted that operational departments for which some research is most closely relevant will always have been aware of it and its results, long before the latter emerge in the form of a working paper or other publication.

21. The relevance of the research to operations is a constant cause for concern. This concern is reflected in the fact that all research proposals must contain a discussion of their operational relevance, and that the panels which evaluate research proposals before they come to the Research Committee often include a majority of members from operational departments. The same is true of the panels which evaluate past research projects. It nevertheless remains true that operating departments play limited direct roles in the genesis of research projects.

22. We turn now to the kind of end-products where sufficient dissemination may imply more than publication; an element of training may be required. This is the case with techniques which are unfamiliar not only to operational staff in the Bank but also to potential users in developing countries. There are two stages of dissemination in such cases. The first is the spreading of the gospel through publications and discussions. Only if sufficient agreement is thereby established that such methods should be promoted in the Bank's own work, or if a demand is created in developing countries, is there a need for further education and possibly for adaptation to a production-line basis.

23. Examples of the process have been given in the two case studies in the third chapter of this year's and last year's annual reports. Another example of the above stages has been work on the methodology of project analysis. The original research was carried out outside the Bank. Further development took place in the Bank in an attempt to provide a better foundation for Bank appraisal work. The first stage, that of reaching sufficient agreement, has taken a long time. There is now, however, a sufficient consensus that some increased effort should be put into the absorption of these techniques, and plans for doing so are being made. Another example is the possible use of social accounting matrices (SAMs). This technique is still in the first stage described.

24. There are other areas where greater demands are necessarily made on the addressee, and where the second stage of dissemination may be particularly difficult. An example is the construction and use of computerized models for planning, in a country or a region, a time-series of investments in industrial sectors where economies of scale are important. This is a case where applications of the technique, developed in the Bank, have been made in Egypt, the ASEAN countries and the ANDEAN common market countries, and where the Industrial Projects staff sees an important potential. An active and continued use of large sectoral models (e.g., the CHAC agricultural model), or country-wide models would make even greater demands on the user in terms of updating inputs and adopting the models to changing economic relations and improvements in methodology. Ultimate dissemination might mean the creation of specialized units in developing countries to handle the innovation, provided of course, there is a continued conviction of its operational value. Where an appropriate unit already exists, dissemination can be arranged by visits on the part of the research staff, and by inviting key personnel to Washington. There have been a number of contacts of this kind made by research departments in connection with overall and sectoral planning. Probably more resources should be devoted to this.

25. It is only fairly recently that these more serious problems of dissemination, involving all parts of the Bank, have become apparent. Certain steps have been taken (e.g., workshops), but it is not yet clear whether they are the right ones. It is an open question, for example, how much effort should be put into the first stage. It is undesirable to appear to be forcing things down peoples' throats, but, on the other hand, there must be adequate institutional capacity in both the Bank, and in developing countries, to judge the value of innovations, and if necessary, adapt them for use. It is certain that the problem has to be approached from both ends, an increased participation of potential users as well as the kinds of research undertaken. It is not merely a matter of improving channels of communication by some conventional service, such as holding more seminars. For the Bank, the question is one of allocation of resources. Operational activities at one extreme and research per se at the other compete for the resources needed for the process of dissemination and assimilation. It will be necessary to ensure that sufficient resources are available for whatever balance between these functions is decided upon.

COUNTRY REFERENCE AND COLLABORATING INSTITUTIONS:
RESEARCH PROPOSALS APPROVED IN FY77

<u>Project No.</u>	<u>Title</u>	<u>Country</u>	<u>Collaborating Institutions 1/</u>
671-45	Programing and Designing Investments: The Indus Basin	(i) Pakistan	(i) Water and Power Development Authority, Pakistan (ii) Pakistan Institute of Development Economics (iii) HARZA Engineering Pakistan 2/
671-46	Appropriate Technology for Water and Waste Disposal	(i) Afghanistan (ii) The Bahamas (iii) Brazil (iv) Cameroon (v) Ghana (vi) Greece (vii) Iran (viii) Ivory Coast (ix) Kenya (x) Malaysia (xi) Nicaragua (xii) Pakistan (xiii) Peru (xiv) Thailand (xv) Tunisia (xvi) Turkey	(i) Asia Institute of Technology- Bangkok, Thailand (ii) National Environmental Engineering Research Institute, Nagpur, India (iii) Ms. I. Nieves, INCAP, Guatemala (iv) Mr. M. Blackmore, Ministry of Local Govt. and Lands, Botswana (v) Mr. A. M. Wright, University of Science and Technology, Ghana (vi) Mr. R. Estrada, Centro Mesoamericano de Estudios Sobre Tecnologia Appropiada, Guatemala (vii) Dr. P. A. Oluwande, University of Ibadan, Nigeria (viii) Ross Institute of Tropical Hygiene, London School of Hygiene & Tropical Medicine, U.K.
671-47	Strategic Planning to Accommodate Rapid Growth in Cities of Developing Countries	(i) Colombia	(i) Corporacion Centro Regional de Poblacion, Colombia
671-48	Urban Labor Markets in Latin America	(i) Colombia (ii) Peru	(i) Catholic University of Peru

1/ Includes names of consultants associated with the collaborating institutions.

2/ Through UNDP Project.

<u>Project No.</u>	<u>Title</u>	<u>Country</u>	<u>Collaborating Institution</u>
671-49	Education and Rural Development in Nepal and Thailand	(i) Nepal (ii) Thailand	(i) Mr. M. Seetisarn, Chiang Mai University, Thailand (ii) Dr. L. C. Coombs, The University of Michigan, U.S.A. (iii) New ERA, Nepal (iv) Mr. L. Lau, Stanford University, USA (v) Mr. Baidya, Nepal (vi) Social Science Research Center, Thailand
671-50	Economic Role of Railways (Phase I)	-	-
671-51	Appropriate Industrial Technology	-	-
671-52	Occupational Structures of Industry	-	-
671-53	El Salvador Health Study	(i) El Salvador	(i) The Institute of Nutrition of Central America and Panama
671-54	Economics of Educational Radio	(i) Brazil (ii) Israel (iii) Kenya (iv) Korea (v) Nicaragua	(i) International Extension College, U.K. (ii) Everyman's University, Israel (iii) Korean Educational Development Institute, Korea (iv) Kenyan Institute for Adult Studies, Kenya (v) Stanford University, Institute for Mathematical Studies in the Social Sciences, U.S.A.
671-55	Retention of Literacy/Numeracy Skills Among School Leavers	(i) Egypt	(i) National Center for Educational Research, Cairo (ii) Ministry of Education, Cairo (iii) Faculty of Education, Ain-Shams University
671-56	Marketing Manufactured Exports	(i) Colombia	-
671-57	Distribution of Income Through the Extended Family System	(i) Senegal	(i) Société National des Etudes de Développement, Senegal (ii) Mr. A. Slama, Centre National D'Etudes Agricoles, Tunisia (iii) Institute Fondamental d'Afrique Noire, Senegal (iv) Société d'Aménagement et d'Exploitation des Terres du Delta Sénégalais

COUNTRY REFERENCE AND COLLABORATING INSTITUTIONS:
RESEARCH PROPOSALS APPROVED IN FY78
 (As of 12/31/78)

<u>Project No.</u>	<u>Title</u>	<u>Country</u>	<u>Collaborating Institutions</u> ^{1/}
671-58	A General Algebraic Modeling Systems (GAMS)	-	-
671-59	Small-Scale Enterprise Development	(i) Japan (ii) Korea (iii) Colombia (iv) India (v) Philippines (vi) Taiwan	(i) Mr. T. S. Papola, The Giri Institute of Development Studies, India (ii) Others to be identified
671-60	Textbook Availability and Educational Quality	(i) Nicaragua (ii) Philippines ^{2/}	(i) Programa de Estudios Conjuntos de Integracao Economica Latino-Americano (ii) Mr. P. Suppes - Institute of Mathematical Studies in the Social Sciences, Stanford
671-61	Socio-Economic Aspects of Fertility Behaviour	(i) Botswana	(i) Botswana Central Statistics Office
671-62	India: Impact of Agricultural Development on Employment and Poverty - Phase I	(i) India	(i) Indian Statistical Office
671-63	Labour Migration and Manpower in the Middle-East and North Africa	(i) Algeria (ii) Libya (iii) Iraq (iv) Iran (v) Saudi Arabia (vi) Kuwait (vii) United Arab Emirates (viii) Bahrain (ix) Oman (x) Qatar	To be identified

^{1/} Includes names of consultants associated with the collaborating institutions.

^{2/} IEA data from India, Iran, Thailand, Chile, Botswana and ECIEL data from Mexico, Peru, Bolivia, Paraguay, Argentina and Brazil will also be used.

<u>Project No.</u>	<u>Title</u>	<u>Country</u>	<u>Collaborating Institution</u>
		(xi) Egypt (xii) Jordan (xiii) Syria (xiv) YAR (xv) PDRY (xvi) Morocco (xvii) Tunisia (xviii) Turkey (xix) Sudan	To be identified
671-64	Food Deficits of Target Groups	(i) Morocco (ii) Brazil (iii) India	-
671-65	Small Enterprise Financing: Role of Informal Credit Market	(i) India	-
671-66	World Development Report	-	(i) Free University, Brussels
671-67	Effects of Increased Imports of Manufactured Goods from Developing Countries	-	-
671-68	Key Institutions and Expansion of Manufactured Exports	East Asian & Latin American countries - to be identified.	-
671-69	Capital Market Imperfections and Economic Development	(i) Taiwan (ii) Indonesia (iii) India (iv) Korea	-
671-70	Case Studies of Determinants of Recent Fertility Decline	(i) Sri Lanka (ii) India	(i) Demographic Unit, Sri Lanka (ii) Bureau of Economics and Statistics, India

OFFICE MEMORANDUM

TO: Members of the Research Advisory Panel
on Income Distribution and Employment

DATE: October 10, 1977

FROM: Orville F. Grimes, Jr., VPD *OG*

SUBJECT: The Research Committee: An Informal Early History

1. This memorandum outlines the rationale and origins of the Research Committee, established in April 1971 to guide the conduct of research in the Bank. While the coverage is selective and treatment of each topic is brief, this account may provide a basis for more detailed discussions with participants in the events described.

Antecedents

a. 1968 Review by Orcutt

2. One of the earliest reviews of Bank research, prepared by Professor Guy Orcutt in 1968, took the view that the Bank should be doing a great deal more research than it was then doing. A five-year target budget of \$10 million per year was recommended as both feasible and "as small as should be considered reasonable." "If the Bank doesn't have the responsibility, the resources, and the opportunity to carry out and promote (inductive and applied research along with needed research tool building), then who does?" ^{1/} In its simplest form the principal contention of the paper appears to be that (a) the Bank needs knowledge to formulate intelligent policy; and (b) research can supply that knowledge.

3. Another suggestion of the Orcutt review was that since research in the Bank was then scattered among Area, Project, and Economic Departments, there was need for further consolidation of research activities. One wonders whether this conclusion followed from a more all-inclusive perception of research than was (and is) generally accepted in the Bank, in which the analytical work of operational units is regarded more as support of country programs and projects than as research. Already, in fact, most staff engaged in research on the narrower definition had been grouped in departments which devoted a significant portion of their resources to research. This paper called attention to the inefficiencies from duplication of effort, failure to

^{1/} Guy H. Orcutt, "Research and the World Bank," May 6, 1968, p. 10.

initiate research on high priority topics, and inadequate contact with users among departments conducting research. However, it seems to have contributed little to later attempts to coordinate research on a Bank-wide level.

b. Economics Department Research Committee (1969)

4. A subsequent attempt to improve the coordination of research was the formation in January 1969 of a Committee of nine members, drawn mostly from operating departments, to advise on the research program of the Economics Department of the Central Economic Staff. Chaired by Andrew Kamarck, the Economics Department director, this Committee was established so that operational departments would "...be familiar with the (Economics Department research) program and make a contribution to its periodical assessment and to the general direction of the research effort." Responsibility for planning and carrying out research remained with the Economics Department.

5. Though such a judgment is undoubtedly easier with hindsight, it seems evident that given its mandate as an advisory rather than a review body, the success of the Economics Department Research Committee depended critically on the quality (particularly the level of detail) of the documents it was asked to examine. In the event, the Committee met three times during 1969 to discuss the future research programs of individual Divisions. These were presented as a series of brief statements about the need for research on selected topics. On this basis Committee members found it difficult to comment in depth on specific proposals, and on probably more than one occasion, "questions regarding the details of methodology and content were raised, but the Committee felt this should be left to the researchers to decide." ^{1/} Advice to the research sponsors thus consisted primarily of requests to give more weight to some topics and de-emphasize others. Little scope could have been expected for setting down guidelines on how the studies could have best been carried out.

^{1/} Review of research program of Economics of Industrialization Division, July 29, 1969, p. 3.

c. Pearson Commission Report (1969)

6. During this period the report of the Pearson Commission was issued. It suggested that multilateral lending agencies should begin to finance research projects on a larger scale than hitherto, and recommended that the World Bank (as well as the Regional Banks) "pay greater attention to problems of research and development in their country studies and should themselves identify needs for scientific and technological research. Increased involvement in, and support of, such research activities will considerably strengthen the capacity to formulate projects in agriculture, education, and urban services, which take full account of the specific needs of the country." 1/

d. Review of Progress (Balassa, 1971)

7. In October 1970 Hollis Chenery was appointed Economic Adviser to the President and initiated a review of the research program. A comprehensive review ("Economic Research in the Bank," January 1971, prepared by Bela Balassa) went beyond previous efforts by suggesting that individual research projects be appraised in terms of their relative costs and benefits, describing the requirements of a coordinated research program, and evaluating each of the studies undertaken in the Central Economic Staff. Employment, planning, trade policy, and other new areas of inquiry were proposed to the two research departments (the Development Research Center and the Economics Department) with a comparative advantage in their design and execution. These departments would prepare research proposals which should have the support if not the active participation of operational departments, which would also participate in the selection and review of proposals and in evaluation

1/ pp. 205-206

of completed research. 1/ The report concluded that "Responsibility for setting research priorities, approving the overall research program, and establishing a review process on research should be entrusted to an Economic Research Committee chaired by the Economic Adviser to the President." 2/

Research Committee: Scope of Activities

8. This section briefly describes the birth and early development of the Research Committee, and touches upon its subsequent evolution. The coverage is limited to a few themes raised when the Committee was established and dealt with at various times during its formative period. Since these themes are also taken up in the successive Annual Reports on Bank research, especially the last two, the discussion does not extend much beyond early 1974.

a. Objectives and Purpose

9. Consistent with the recommendation of the Balassa review, a Bank-wide Research Committee was established in April 1971. A general set of guidelines was prepared in Mr. Chenery's memorandum of March 1971 (Annex 1); these were subsequently adopted by the Committee. While in size

1/ p. 22. Research departments of the Central Economic Staff were encouraged to improve cooperation with each other as well as with operational units. An illustration cited in the report was the Basic Research Center (now the Development Research Center), established in 1969, whose major research projects in the first 18 months of operation were undertaken by outside academics. The work of the Center "has to be made more relevant for the Bank's operational activities. This could be accomplished by involving the operational departments in the choice and the implementation of the research projects, by establishing close cooperation between the Center and the Economics and Economic Program Departments, and by making the Center's research program an integral part of the overall research program of the Central Economic Staff." (p. 20).

2/ p. 23.

the Committee has remained at roughly 10-12 members, the composition has varied in response to changes in staff responsibilities, attempts to ensure representation of a broad range of departments producing and using research, and the normal succession of staff each serving for about two years. A list of Bank staff who are or have been members of the Research Committee, with their period of tenure, is attached as Annex 3.

10. It was established at the first meeting of the Committee that its terms of reference were to extend beyond the review of project proposals. "There would be broad responsibility for developing an overall research program, setting priorities and, where necessary, initiating research proposals." (minutes of first meeting, p. 2). An implication of this mandate was that when the administrative arrangements for the research program were in full operation, the Research Committee would review and advise the Chairman on all major studies undertaken with Bank resources. The Committee would consider proposals within a long term program of research, whose estimates of cost would serve as the basis for a yearly review of research and for budget allocations.

11. In its early deliberations the Committee further made a rather careful distinction between research undertaken inside the Bank and that contracted to outside analysts. A note on the role of development research in the Bank discussed at the first meeting of the Committee indicated that at a later date an external committee on development research was also envisaged, to advise on overall priorities and on relations with outside research groups. 1/

12. An informal panel of outside advisers 2/ had met in December 1970 to discuss alternative means for the Bank to coordinate research with agencies in developing countries.

1/ This proposal was discussed with Mr. McNamara at that time, but the establishment of external panels was deferred until programs in the major areas had been in operation for a reasonable period. The first panel (on population) was set up in 1975.

2/ Messrs. G. Ranis, M. Bruno, C. Diaz-Alejandro, W. Falcon, D. Hopper, B. Minhas, T. Watanabe.

This was followed by a conference of directors of research and training institutes in Belgrade (August 1972), jointly sponsored by the OECD Development Centre and the Bank, in which many of the papers presented had been prepared by Bank staff or under Bank auspices. ^{1/} However, as it became clear that projects, even though carried out by others, required at least a critical minimum of Bank design and supervision, the distinction between in-house and outside research became less meaningful.

13. In the first year of operation both the objectives of the Committee and the criteria by which it judged proposals were further clarified. Its functions were seen in May 1972 as (a) recommending an overall research budget and allocating the resources among different subject areas and individual projects; (b) recommending total staff resources to be devoted to research and the distribution within the Bank required for the successful implementation of the research program; (c) monitoring the implementation of such other research objectives as involvement of developing country institutions, liaison with academic institutions and coordination of research with other agencies; and (d) evaluating the Bank research program and individual research projects.

14. The following criteria for consideration of proposals were established: (i) research design; (ii) priority of the subject; (iii) relation of the project to the sector or the general subject; and (iv) the time in which useful results could be expected. An appropriate balance was sought between studies at the basic vs. at the applied end of the spectrum, those more "risky" or less so, and those yielding useful results over the long term or sooner. As to the extent of participation by outside research institutes, the Committee in a May 1973 meeting recognized that lack of Bank staff limited the progress of research in many areas. While not encouraging the submission of unsolicited proposals from outside, the

^{1/} The other topics were multi-level planning models and decentralized decision making, income distribution and employment, and private foreign investment. Suggestions for improving cooperation among research agencies were made in light of a survey of the priority interests of these institutions by Peter Clark, then a Bank staff member.

Committee decided to accept a limited expansion of research conducted by outside institutes, provided Bank staff participated fully in the design and monitoring and that the proposals were judged against the same criteria applied to research conducted by the staff.

b. Sector Reviews

15. At the mid-year review of the FY73 research program, the Committee recognized that a continuing problem was the absence of a broader, long-term framework within which to consider individual projects. One outcome of this concern was the preparation of guidelines for the allocation of funds by sector over the ensuing five years, which were later set out in the first Annual Report on Bank research (November 12, 1973). Another was a series of sector reviews, held from January to April 1973, on the basis of one- or two-year research programs. Attached as Annex 2 are the conclusions of this review, considered by the Research Committee in May 1973, for research on income distribution and employment.

16. At irregular intervals, the Committee has considered overviews of research priorities in particular sectors. A paper on income distribution research discussed at a meeting in March 1975 identified seven categories of research in which the Bank had a potential interest: developing the factual base, developing measures of inequality and social welfare, modelling growth and distribution, modelling a part of the economy, studying isolated relationships, studying the historical experience of growth and distribution, and studying the impact of particular policy instruments. ^{1/} Aside from suggesting that additional work on data collection or modelling should have a clear policy focus, little guidance was provided by the Committee on the relative emphasis to be placed on each of these categories. One suggestion was that a list of policy instruments that influence income distribution should be drawn up, with assistance from country and project analysts, as a basis for determining the relevant topics amenable to research. An issue not yet resolved from this and subsequent reviews of research on education (October 1975) and urban problems (March 1976) is whether

^{1/} M. Ahluwalia, "Income Distribution Research: An Overview of Research Prospects", March 1975.

reviews of this sort tend inevitably to produce a broad menu of possible research categories, perhaps admitting all potential studies on an equal footing, or could instead provide a strategy for setting research priorities or identifying promising projects.

17. Research directions for the Bank and others were reviewed in a much broader context during the conference on social science research held at Bellagio in February 1974 and co-sponsored by the Ford and Rockefeller Foundations, IDRC, USAID, and the Bank. The need for coordination of research activities in the form of consultations and exchange of information led to several programs of exchange of reports and project descriptions among major donors. It was also agreed that networks of research agencies could play an important role in financing and carrying out research in developing countries. Participants accordingly decided to hold smaller meetings of subgroups to exchange information on research priorities in these areas, explore possibilities for joint financing, and improve their awareness of externally-financed research being undertaken.

Attachments

cc: Messrs. Chenery, Balassa, B. B. King

THE ROLE OF DEVELOPMENT RESEARCH IN THE WORLD BANK

As the scope of its activities has expanded, the World Bank has taken on a number of new functions, including the conduct of research on development. Hitherto not much consideration has been given to the proper function of research in the Bank or to the role of the Bank in relation to research done elsewhere. The purpose of this memorandum is to suggest guidelines for a systematic program of development research for the Bank.

Relation of Research to Bank Objectives

2. Many activities originally undertaken as incidental to lending are now recognized as proper functions of the Bank as a development institution. These include the preparation of country economic reports and specialized sector analyses, on which the Bank now spends more than \$15 million per year. The Bank also regards institution building and the provision of technical assistance as important additional objectives to the transfer of financial resources. More recently the Bank has recognized the need to support agricultural research in order to increase the technological information available to the developing world. In these and other ways, the Bank is taking increased responsibility for improving knowledge of the development process.

3. While it is recognized that research on a variety of economic, social, and technical questions is required as a basis for development policy, the Bank itself has taken only limited steps to support this activity. Total Bank resources allocated for research -- broadly defined -- in FY 71 were about \$2-3 million, of which less than \$500,000 was for consultants. Hardly any Bank funds are used to finance research institutes in developing countries.

4. A large part of the research financed by the Bank has been geared to acquiring information necessary to design and evaluate projects (e.g. the highway design study and the Indus Basin study). By contrast little work has been done on the general methodology of project appraisal or on the relationship between national policy objectives and project selection. Despite the Bank's interest in the broader aspects of the development process and in the choice of development strategies, research on these problem areas has been scanty -- with some exceptions such as fiscal policy and protection.¹

5. In short, the present research effort is limited, uncoordinated, and lacking in focus. The most useful research undertaken has been

^{1/} Despite the limited resources available, there have been several significant pieces of individual work. (Bela Balassa's survey of Economic Research in the Bank, January 1971).

primarily for the Bank's immediate operational needs. Wide areas relevant to the Bank's broader policy interests have received little attention. No effort has been made to improve the developing countries' ability to undertake research on their own behalf.

Orientation of Future Development Research

6. The Pearson Commission recommended that the Bank should take a more active role in a variety of research fields. So far, the Bank has considered the overall needs of technological research on questions of population and agriculture. A similar examination is needed of the uses of economic and social research, the existing institutions which support and carry out such research, and the proper role for the Bank in this area. It will take time to develop a comprehensive program of action.

7. The Bank should concentrate on those areas where its experience will give the Bank a comparative advantage that can be utilized in research work. The Bank is unique in having accumulated experience on projects, in undertaking country economic missions on a regular basis, and in carrying out policy advisory activities. It therefore has an advantage in project- and policy-oriented research and in utilizing the data made available through its country missions.

8. Beyond this, the absence of special advantage, as well as the need to avoid building up an overly large staff, call for the use of outside researchers. In most cases, cooperative arrangements with research groups would be the appropriate vehicle. The Bank will need some "counterpart" staff to ensure that such research is oriented towards the proper objectives. This will entail expanding the Development Research Center. Some of the functional divisions of the Economics and Economic Program Departments will also be involved. There is a need for the Bank to make better use of the most advanced research techniques and findings in the principal areas of development economics.

9. The first task will be to indicate the major research objectives, the types of research needed to pursue them, the role that the Bank can play in carrying out such research, and the organizational arrangements necessary to ensure that research actually serves these objectives. Among the objectives of a coordinated program, a distinction should be drawn between internal objectives that are directly related to the Bank's activities and external objectives that are indirectly related to them. This is not a rigid distinction since research aimed primarily at external objectives will often provide a basis for improvements in the Bank's work. Conversely, research directly related to Bank activities will benefit the developing countries not only through Bank operations but also by increasing the knowledge of development.

Internal Objectives

- (1) The establishment of a factual and conceptual basis for Bank policies on particular aspects of development: population, resource mobilization, international trade, the use of development programs, etc.
- (2) Support for Bank operations in particular sectors: agriculture, industry, transportation, education, etc.

External Objectives

- (3) Increasing knowledge of the basic development process in areas of particular importance to the Bank, such as development strategies, employment, rural-urban balance, the productivity of capital and of external resources, the transfer of technology, etc.
- (4) Development of institutional capacity for research in the developing countries both to support planning and policy efforts and to increase knowledge of the development process.

10. The principal change from present Bank thinking is to recognize the need to develop and support research institutions in the developing countries which can undertake an increasing share of the empirical research and analysis. Since the quality of Bank economic reports can be no better than the underlying data available and the understanding of the development process in each country, the Bank's own interests would also be served in this way.

11. The external objectives may best be served if the Bank's research activities -- both in-house and sponsored -- are geared primarily to attaining internal objectives because of the gain in relevance and sharpness that will follow. Topics for cooperative research can be selected with these objectives in mind.

Types of Bank Research

Lending-Oriented Research

12. The selection of projects to be financed by the Bank should further the development objectives of a particular country. To attain this goal the Bank should carry out research on the methodology of project appraisal, giving attention to the interdependence of the project, the sector and the national economy. This requires, first, research on the use of shadow prices of foreign exchange, capital, and labor taking appropriate account of economic and social objectives and their application in particular countries.

Second, research is needed in formulating sectoral policies in the framework of an overall development strategy. Third, there is need for research on the relationship of projects with sector. In these areas the Bank should apply existing knowledge and also undertake original research to adapt known techniques to its needs.

Policy-Oriented Research

13. As its role as a policy advisor expands, the Bank needs to clarify some of the major policy issues in development, explore alternative solutions to particular problems and, to the extent possible, unify the practices followed by Area and Projects Departments. Position Papers will be required setting out the relevant alternatives and their respective advantages, to provide for the continuous evolution of Bank policies on particular questions. These position papers should deal with developmental objectives, the choice of policies aimed at reaching particular objectives, and the use of policy instruments.

14. Position papers are as good as the research underlying them. They require research on policy objectives such as growth, employment, income distribution and the trade-off among them; on policy choices such as export promotion versus import substitution, agriculture versus industry and public versus private enterprise; and on policy instruments such as exchange rates, tariffs, quotas, taxes, and investment licensing. Bank research in these fields may range from evaluating the applicability of existing findings to original research undertaken by Bank staff possibly in cooperation with researchers in developed and developing countries.

Knowledge of the Development Process

15. While intimately related to policy-oriented research, the objective of increasing our knowledge of the development process goes beyond the immediate operational needs of the Bank. Such research is nevertheless valuable for the Bank since an increased understanding of the process of development will contribute to improvements in policy-advice and lending activities. This type of research is carried out at universities and research institutes and many gaps remain to be filled before it can be applied to practical problems. Questions like the relationship of population and economic growth, the environmental effects of industrial development, or the productivity of foreign aid have received little attention. Yet answers to these questions can help to improve Bank policies and the selection of projects. This suggests the need for the Bank to systematically explore the implications of research carried out elsewhere.

16. The Bank is in a good position to formulate this type of research project but it may not have an advantage in carrying it out. Thus the Bank should extend contractual support for research done elsewhere. The need to make the results of such external research relevant to the Bank's activities will usually call for cooperative arrangements with the research institute concerned.

Research Capacity in Developing Countries

17. Institution-building in, for example, development banking, highway design, and agricultural planning is a recognized objective of the Bank. But improving the capacity of the developing countries to undertake economic research has received little or no attention. The development of indigeneous research capacity is an important part of the task of improving policy-making. From past experience it can be demonstrated that the Bank's policy-advisory and lending activities benefit directly from the availability of reliable data and other results of indigeneous research.

18. The experience of Pakistan, India, Israel, Chile and Nigeria shows the value of local research groups and the improvements that are possible within as little as five years. In each of these countries small research groups supported initially by foundations have made substantial contributions to the understanding of the development of their own countries, thereby both facilitating a better analysis of their current economic problems and contributing to the broader growth of knowledge of development.

19. While the financing of these institutes is basically the responsibility of the individual countries, the Bank can contribute to their-development through cooperative arrangements and by sponsoring research on problems relevant to a particular country. Cooperative research projects bring direct benefits to the Bank since they facilitate exploring various issues in a comparative framework. In turn, apart from obtaining some additional financing, research institutes in developing countries would benefit from the technical assistance and coordination the Bank can provide.

20. In addition to comparative studies, there is need for research on the experience of individual countries which should be commissioned in cooperation with the Area Departments to ensure that projects enhance the Bank's understanding of a country's economic problems.

21. These provisions would help existing research institutes in developing countries. But they would not contribute to the establishment of new institutes in countries like Turkey, Korea, Tunisia, and the Central American Common Market. It is not proposed that the Bank should finance the establishment of such institutes, since

this can be done more readily by private foundations. But the Bank can play an intellectual and financial role in furthering the development of such institutions once they are launched.

Implementation

22. In order to develop these ideas further and to put them into operation, the following stages are envisaged:

1. Discussion of this memorandum in the Economic Committee and with an informal panel of external advisors who have been invited for this purpose (Professors Ranis and Falcon [U.S.], Hopper [Canada], Diaz-Alejandro [Cuba], Watanabe [Japan], Minhas [India], and Bruno [Israel].)
2. Establishment of an Economic Research Committee in the Bank -- with members drawn from the Central Economic Staff, the Area and Projects Departments, and IFC -- having responsibility to set research priorities, advise on research proposals, and review research results. Interdepartmental research panels should also be formed to evaluate research in particular fields.
3. With the help of the external advisors, the Economic Research Committee will identify promising areas for cooperative research. Topics in the fields of employment, population, agriculture, resource mobilization, the use of planning models and industrial technology have already been identified and are included in the budget proposals for FY 1972.
4. Once the general lines of the Bank research policies have been approved, the establishment of an external committee on development research to advise the Bank on research priorities and on relations with the external research community is proposed.

Hollis B. Chenery
March 15, 1971

(Extract from: "Formulating a Bank Research Program," A. Ray and E. Stern, May 21, 1973)

Income Distribution and Employment

The immediate program of the Income Distribution Division involves preliminary empirical and methodological work. The basic issue in this program concerns the balance between the four areas identified in the DRC discussion paper - i.e., evaluation of data, general policy reviews, quantitative general equilibrium models and project evaluation. No consensus emerged during the meeting regarding the areas of priority. The discussion paper also contains possible elements of a longer term program. Program preparation and the identification of the research options appeared to be strongest in this area among the major areas discussed.

A large part of the FY1974 expenditures will be for completing the Korea and Yugoslavia models (RPO 206) and the Brazil model (RPO 269). As noted during the meeting, large scale projects to generate data may not be suitable for Bank financing but should await, in any event, the necessary background work on the problems of measurability and data interpretation. This is the primary intent of the ECLA and ECIEL projects...and of the Botswana Survey being funded separately.

Research on employment in the Population and Human Resources Division is presently limited to the studies of labor markets and the unemployment survey in Costa Rica (RPO 245, 247). The Belo Horizonte project tentatively approved by the Committee in April is basically a part of RPO 245 and does not extend the area of research involvement. While it may not be feasible with existing staff to undertake new employment research in addition to these studies and the study on public works which it is monitoring, research on the employment aspects of development has no strategy and is weak. Little work seems to be in progress which will yield projects in the next few years. It was suggested during the meeting that a comparative study on the structure and nature of unemployment in different countries would fill a priority need.

In judging the adequacy of the programs of research on income distribution and employment, we note that concern with these areas is beginning to run through most of the research program as a whole. While this is a welcome development, there is no framework in terms of which the intended contributions of the other studies can be meaningfully assessed. There is therefore an apparent need for a broader research strategy, especially in employment, which will give guidance to the preparation of other research projects relevant to these areas.

Research Committee Members

	H. B. Chenery (Chairman)	April 1971 -
Mrs.	I. Adelman	November 1971 - Spring 1972
	H. A. Adler	Summer 1971 - October 1974
	J. H. Adler	April 1971 - Spring 1972
	D. Avramovic	April 1971 - October 1974
		November 1975 - February 1977
	B. Balassa	April 1971 -
	G. B. Baldwin	April 1971 - December 1971
	J. Baneth	Spring 1972 - October 1974
	B. de Vries	October 1974 -
	V. Dubey	November 1975 -
	R. Gulhati	April 1971 - October 1974
	M. ul Haq	Spring 1972 - March 1973
Mrs.	H. Hughes	October 1974 - September 1975
	E. V. K. Jaycox	October 1975 -
	A. Karaosmanoglu	November 1972 - November 1975
	B. B. King (Deputy Chairman)	April 1971 - June 1972
		June 1974 -
	P.-P. Kuczynski	May 1972 - October 1973
		December 1976 - July 1977
	E. Lerdau	October 1974 -
	I. M. D. Little	November 1976 -
	R. Picciotto	November 1976 -
	M. Qureshi	March 1972 - October 1974
	H. Schulmann	May 1972 - December 1975
	E. Stern (Deputy Chairman)	January 1972 - September 1974
	W. Thalwitz	October 1974 - August 1976
	H. G. van der Tak	November 1971 -
	H. Vergin	October 1974 -
	J. Waelbroeck	October 1974 - September 1976
	E. B. Waide	April 1977 -
	M. L. Weiner	April 1971 - Spring 1972
	C. Weiss	November 1971 - Spring 1972
	M. Yudelman	October 1973 - November 1976

PANEL
MEMBERSHIP

Suman

INDUSTRIAL DEVELOPMENT AND TRADE

Mr. Assar Lindbeck (Chairman)
Director
Institute for International
Economic Studies
Fack
S-104 05
Stockholm 50
SWEDEN
Telephone: 150160 (Work)
212337 (Home)

Dr. Richard R. Nelson
Institution for Social and
Policy Studies
111 Prospect Street
Yale University
New Haven, Conn. 06520
Tele: (203) 436-4699 (Work)
(203) 777-2255 (Home)

Professor Juergen B. Donges
The Kiel Institute of World
Economics
P.O. Box 4309
D-2300 Kiel 1
Federal Republic of Germany
Telephone: 884205 (Work)
582484 (Home)

Mr. Jae-Ik Kim
Director-General
Bureau of Economic Planning
Economic Planning Board
Seoul, 110,
Korea
Tele: 70-3028 (Work)
59-3605 (Home)

Telex: 0292479

Telex: K23202, DPMEPB

Professor Edmar L. Bacha
University of Brasilia,
Department of Economics
Brasilia, D.F. 70.000
Brazil
Telephone 272.3548 (Work)
242.5039 (Home)

Mr. Gerardo M. Bueno
Mexican Ambassador to
the EEC
Ave. Louise 375
1050 Bruxelles
Belgium
Tele: 6482684

Professor Kirit Parikh
IIASA)
A2361 Schloss Laxenburg)
Laxenburg) Till 08/10
Austria)
Telephone 2236-7521)

After August 10

Indian Statistical Institute
7, S.J.S. Sansanwal Marg
Near Qutab Hotel
New Delhi, 110029
India
Telephone: 664789 or
678888/678823-24-27

World Bank

Industrial Development and Trade Research Advisory Panel

- Chairman: Assar Lindbeck (Sweden):** Professor Lindbeck was born in 1930 and educated at the University of Stockholm, Yale, and the University of Michigan. He is currently Director of the Institute of International Economic Studies at the University of Stockholm, a member of the Swedish Prime-Minister's Economic Council and a member of the Nobel Prize Committee on Political Economy. He has written extensively in macro-economics, on fiscal and monetary economic policies in Sweden and on exchange rates and stabilization policy. He has also served with the Swedish Government, as an Economist at the Ministry of Finance as well as at the Central Bank of Sweden. He is currently a member of the Royal Society of Sweden's Academy of Applied Sciences and the Econometric Society.
- Juergen B. Donges (Germany):** Currently Head of the Development Economics Department at the Institut für Weltwirtschaft, Kiel, Juergen Donges was previously chief of the Institute's Development Planning Division. He is a member of the Scientific Advisory Board to the German Ministry of Economic Cooperation. He has directed research projects on less developed and semi-industrial countries. His publications deal with a wide variety of economic issues.
- Kirit S. Parikh (India):** Currently Professor of Economics and Joint Secretary at the Indian Statistical Institute, Kirit Parikh previously directed the Program Analysis Group in the Department of Atomic Energy. He is a member of several National Planning Committees. His publications concern, mostly, science and technology policies in developing countries and Indian fuel requirements. Professor Parikh holds a doctorate in Civil Engineering from Massachusetts Institute of Technology.
- Richard R. Nelson (U.S.):** Professor Richard Nelson studied at Oberlin College and Yale University. He is currently Professor of Economics at Yale. Prior to that he worked for the RAND corporation. He has also served on the U.S. Council of Economic Advisors. His research and publications range over a wide variety of economic issues, including growth theory, technological change and economic organisation.
- Edmar Lisboa Bacha (Brazil):** Currently Professor of Economics at the University of Brasilia, Edmar Bacha received his doctorate from Yale. He has worked with the Brazilian Ministry of Planning, and in conjunction with the Chilean National Planning Office. His published works deal mainly with industrialization and trade policies, shadow exchange rates and Brazilian economic growth.

Jae Ik Kim (Korea): Currently Director of the Economic Planning Bureau, Economic Planning Board, Korea, Jae Ik Kim previously worked in the Research Department of the Bank of Korea. He obtained his doctorate from Stanford University in Econometric theory. Dr. Kim has been involved in Korean economic policy and planning and has contributed particularly towards directing the development of the electronics industry.

Gerardo M. Bueno (Mexico): Gerardo Bueno studied in Mexico then at Yale. He is currently the Mexican Ambassador to the EEC. Prior to that, he was Director General, CONACYT (Mexican Agency of Technology, Trade and Development Planning) and directed research at the Nacional Financiera. His major involvement has been with trade, technology and development policy.

TERMS OF
REFERENCE

Draft Terms of Reference for Specialized
Research Advisory Panels

The panel has been established to review the research program of the Bank in the field of Industrial Development and Trade. This review should be conducted in the light of the objectives of the Bank's research program as they relate to research in the specific field. These objectives have been defined as follows:

- to support all aspects of Bank operations, including the assessment of development progress in member countries,
- to broaden our understanding of the development process,
- to improve the Bank's capacity to give policy advice to its members,
- to assist in developing indigenous research capacity in member countries.

Given these objectives, the primary task of this panel would be to assess the character, quality and size of the research program in this field and to make recommendations to the management of the Bank regarding priorities for the next five years.

The panel should consider the question of whether the research conducted addresses an important gap in the understanding of the issues and whether the research design and methodologies employed are well formulated. In addition, the

panel should consider the relevance of Bank research to its operations and policy formulations as well as to the process of dissemination by the producers and assimilation by the consumers of research.

Finally, the panel may also wish to consider aspects of cost effectiveness and efficiency in the conduct of the research program.

RES. LISTS

Assar Lindbeck
July 6, 1978

ATTEMPTED CLASSIFICATION OF PROJECTS ON TOPICS

I. Policy-generated incentives for production and trade ("Trade policy")

<u>project</u>	<u>content</u>	<u>reviewers</u>
670-01	Alternative incentive policies: six countries	E.B., J.D.
670-87	Alternative incentive policies: West Africa	E.B., K.J.I.
671-35	Effects of export promotion measures Brazil, Greece, Korea, Pakistan	K.J.I., R.N.
671-10	Export incentives for "new" products in Latin America	E.B., G.B.
670-22	Effects of protection on efficiency. Case studies	E.B., K.J.I.
670- 7	Methodology to analyze long-term adjustments in LDCs	E.B., R.N.
Balassa, B.,	"Tariffs and Trade Policy in the Andean Common Market", (May 1974) (Non RPO-paper)	J.D., R.N.
———,	"Types of Economic Integration (IEA conference 1974) (Non RPO-paper)	J.D., R.N.
———,	"Effects of Commercial Policy on International Trade, the Location of Production, and Factor Movements" (Nobel Symposium 1976) (Non RPO-paper)	J.D., R.N.
———,	"Policy Reform in Developing Countries" (book) (Non RPO-paper)	J.D., R.N.
<u>Access to markets in the DCs</u>		
670-21	Loss of preferences for India in the UK	K.P., K.J.I.
671-67	Effects on product and factor markets - and policies - in the DCs of imports of manufacturing from LDCs	K.J.I., J.D.
670-20	Adjustment assistance in DCs (Conference volume)	J.D., G.B.

II. Growth patterns - domestically and internationally ("Trade-empirical")

<u>project</u>	<u>content</u>	<u>reviewers</u>
671-05	Changes in structure of manufacturing during growth	E.B., K.J.I.
671-32	Sources of (contributions to) growth Input-output data	K.P., R.N.
Balassa, B.,	"A 'Stages' Approach to Comparative Advantage" (Non RPO-paper)	J.D., R.N.
———,	"World Trade and the International Economy: Trends and Policy" (Non RPO-paper)	J.D., R.N.
Keesing D., and Plesch P.,	"Recent Trends in Manufactured and Total Exports from Developing Countries" (June 1977) (Non RPO-paper)	E.B., G.B.
Plesch P.	"Developing Countries' Exports of Electronic and Electrical Engineering Products" (February 17, 1978). (Non RPO-paper)	E.B., G.B.
Keesing D, Plesch P. and Trimer G.,	"Developing Countries' Exports of Textiles and Clothing: Perspective and Policy Choices" (May 31, 1978) (Non RPO-paper)	E.B., G.B.
670-19	Industries Shifted to Singapore, Taiwan, Korea	J.D., G.B.
670-79	Industries Shifted from Japan to other Countries in Asia : textiles, electric machinery, miscellaneous	K.J.I., J.D.

III. Institutions and functioning of markets ("Institutional reforms")

<u>project</u>	<u>content</u>	<u>reviewers</u>
671-68	Institutional changes to promote manufacturing exports. Marketing systems. Promising products. Brazil, Hong Kong, Korea etc.	G.B., J.D.
671-69	Distortions of resource allocations due to capital market imperfections	J.D., G.B.
671-56	Non-price aspects in marketing of exports (Clothing Colombia)	G.B., K.J.I.
670-77	Attempts to help small scale industries, in particular by finance	J.D., G.B.
671-59	Importance of, and policies towards, small enterprise (7 countries)	K.J.I., R.N.
671-65	Credit to small enterprise : the Shraffs in India	J.D., G.B.
O'Mara G.,	"An Econometric Analysis of the Role of Small-Scale Industry in Brazilian Industrialization" (June 1976) (Non RPO-paper) Determinants of size distribution of firms	K.P., R.N.
—————,	"The Role of Small-Scale Industry in Recent Brazilian Industrialization" (April 1978) (Non RPO-paper) Structure of firms and employment in Brazil (dual labor market)	K.P., R.N.

IV. Choice of production technology and capacity utilization
 ("Industrial Programming")

<u>project</u>	<u>content</u>	<u>reviewers</u>
670-23	Alternative production techniques	K.P., E.B.
670-54	Capital-labor substitutions - aggregate and disaggregate production functions	K.P., R.N.
670-51	Policy measures to change production techniques	K.P., R.N.
670-24	Investment planning under increasing returns to scale. Case studies.	K.P., E.B.
Westphal L.E.	"UNDP Proposal - Mexico Plant Equipment Complex Design Study" (March 14, 1978) (Non RPO-paper)	K.P., R.N.
Choi H. and Westphal L.E.	"Outline of the Mexican Plant Equipment Planning Study" (Nov. 19, 1976) (Non RPO-paper) Part of study above.	K.P., R.N.
670-25	Reasons for underutilization of capacity - implications and policy options	K.P., E.B.
670-95	Same as 670-25: four countries	K.P., E.B.

Research Projects on Industrial Development
and Trade

<u>Project No.</u>	<u>Project Title</u>	<u>Responsibility</u>	<u>Date of Approval</u>	<u>Date of 1/ Completion</u>	<u>Date of Evaluation</u>
670-01	Development Strategies in Semi-Industrial Countries	B. Balassa	6/71	4/6/76	
7	International Model	B. Balassa	6/72		
19	Expansion in Manufacturing for Exports in Developing Countries	L. Westphal	3/71	10/1/75	10/2/75
20	Industrialization & Trade Policies for the 1970s	R. Gulhati		12/18/74	
21	Export Promotion & Preferences: India	L. Westphal	3/72	3/2/73	10/2/75
22	Economies of Scale & Tariff Levels	G. Pursell	11/71	No date	
23	Scope for Capital-Labor Substitution in the Mechanical Engineering Industry	Yung W. Rhee	11/71		
24	Programming in the Manufacturing Sector	A. Stoutjesdijk	2/69		
25	Industrial Capacity Utilization in Selected Latin American Countries	F. T. Moore	6/74		

<u>Project No.</u>	<u>Project Title</u>	<u>Responsibility</u>	<u>Date of Approval</u>	<u>Date of ¹/_{Completion}</u>	<u>Date of Evaluation</u>
670-54	Employment & Capital-Labor Substitution	A. Stoutjesdijk	8/72	12/19/74	N/E
77	Financing of Small Scale Industry	L. Westphal	4/73	8/27/74	9/30/75
79	Economic Development of East & Southeast Asia	P. Hasan	6/73	2/17/78	
87	Industrial Policies & Economic Integration in West Africa	B. Balassa	6/73		
95	Industrial Capacity Utilization	A. Choksi	7/9/73	6/30/77	
671-05	Patterns of Industrial Development	V. Prakash	6/75		
10	Promotion of non-Traditional Exports	D. Greene	6/74		
32	A Comparative Study of the Sources of Industrial Growth & Structural Change	S. Robinson	5/75		
35	Export Incentives in Developing Countries	B. Balassa	7/75		
51	Appropriate Industrial Technology	L. Westphal	5/20/77		
56	Marketing Manufactured Exports	D. Keesing	6/24/77		

<u>Project No.</u>	<u>Project Title</u>	<u>Responsibility</u>	<u>Date of Approval</u>	<u>Date of ^{1/}Completion</u>	<u>Date of Evaluation</u>
671-59	Small-Scale Enterprise Development	D. Anderson	10/77		
65	Small Enterprise Financing:V. Bhatt Role of Informal Credit Market		12/77		
67	Effects of Increased Imports of Manufactured Goods from Developing Countries	S. Singh	12/77		
68	Key Institutions and Expansion of Manufactured Exports	D. Keesing	12/77		
69	Capital Market Imperfections and Economic Development	V. Bhatt	12/77		

For Industrial Development & Trade Panel

Non RPO Papers

Industrial Programming

Choi, H. and Westphal, L.E., "Outline of the Mexican Plant Equipment Planning Study," November, 19, 1976.

Westphal, L.E., "UNDP Proposal - Mexico Plant Equipment Complex Design Study," March 14, 1978.

Small-Scale Industry

O'Mara, G., "An Econometric Analysis of the Role of Small-Scale Industry in Brazilian Industrialization, 1949-1970," June 1976.

_____, "The Role of Small-Scale Industry in Recent Brazilian Industrialization," April 1978.

Trade - Empirical

Keesing, D. and Plesch, P., "Recent Trends in Manufactured and Total Exports from Developing Countries," June 6, 1977.

Plesch, P., "Developing Countries' Exports of Electronics and Electrical Engineering Products," February 14, 1978.

Keesing, D., Plesch, P., and Triner, G., "Developing Countries' Exports of Textiles and Clothing: Perspective and Policy Choices," May 31, 1978 (first draft).

Trade Policy

Balassa, Bela, "Tariffs and Trade Policy in the Andean Common Market", Journal of Common Market Studies, December 1973, pp. 176-195. Spanish translation in Revista de la Integracion, May, 1974, pp.7-34

_____, "Types of Economic Integration", in Economic Integration, Worldwide, Regional Sectoral (Fritz Machlup, ed.) Proceedings of the 4th Congress of the International Economic Association held in Budapest, Hungary in August 1974, London, Macmillan, 1976, pp. 17-31.

_____, "Effects of Commercial Policy on International Trade, the Location of Production, and Factor Movements" and "Reply to Comments" by Tibor Scitovsky and Melwyn

B. Krauss in The International Allocation of Economic Activity, pp. 230-58, 270-74. (Bertil Ohlin, Per-Ove Hesselborn, and Per Magnus Wijkman, ed.) Proceedings of a Nobel Symposium held at Stockholm in June 1976. Macmillan, London, 1977.

Balassa, Bela, "A 'Stages' Approach to Comparative Advantage," (forthcoming).

_____, "World Trade and the International Economy: Trends, Prospects and Policy", World Bank Staff Working Paper No.

_____, Policy Reform in Developing Countries, Oxford, Pergamon Press, 1977.

Summary Table 2: External Research Program
Industrial Development and Trade

Project No.	Department Responsible	Expenditure in Current \$'000						Authorizations in Current \$'000		Total Project Cost
		Pre FY74	FY74	FY75	FY76	FY77	Total	FY78 Carryover	FY79	Exp. to FY77 & Auth. FY78-79
670-01	DRC	111.6	-	-	12.7	0.7	135.0	6.3	-	141.3
07	DRC	28.2	3.8	5.0	2.6	-	39.6	-	-	39.6
19	ECD	4.5	-	-	-	-	4.5	-	-	4.5
20	ECD	18.2	-	-	-	-	18.2	-	-	18.2
21	ECD	18.0	-	-	-	-	18.0	-	-	18.0
22	DED	16.0	-	-	-	-	16.0	-	-	16.0
23	DED	80.2	17.7	7.4	8.5	8.0	121.8	6.2	-	128.0
24	DED	36.6	71.5	27.0	36.5	28.5	200.1	17.5	19.0	236.6
25	IDF	-	37.5	-	-	-	37.5	12.5	-	50.0
54	DRC	89.8	-	-	-	-	89.8	-	-	89.8
77	ECD	-	34.7	-	-	-	34.7	-	-	34.7
79	EAP	-	26.5	26.5	-	-	53.0	-	-	53.0
87	DRC	-	25.9	46.5	12.2	3.0	87.6	6.0	-	93.6
95	ECD	-	32.0	26.2	-	-	58.2	-	-	58.2
1-05	DED	-	-	11.0	27.7	17.2	55.9	2.6	-	58.5
10	LCN	-	-	3.1	3.9	35.0	42.0	-	-	42.0
32	DED	-	-	-	56.5	42.6	99.1	49.3	3.2	151.6
35	DRC	-	-	-	44.8	52.1	96.9	80.1	-	177.0
51	DED	-	-	-	-	-	-	24.0	2.8	26.8
56	DED	-	-	-	-	-	-	17.9	14.6	32.5
59	DED	-	-	-	-	-	-	112.0	80.4	192.4
65	DED	-	-	-	-	-	-	14.3	53.8	68.1
67	EPD	-	-	-	-	-	-	-	100.8	100.8
68	DED	-	-	-	-	-	-	29.2	63.8	93.0
69	DED	-	-	-	-	-	-	28.2	10.1	38.3

OFFICE MEMORANDUM

TO: Members of the Industrial Development
and Trade Panel

DATE: June 27, 1978

FROM: Bela Balassa, VPD

SUBJECT: Project Assignments

1. In conjunction with Professor Lindbeck we have divided up the various research projects and studies among the members of the panel. While this has been done with reference to the interests of the particular members, any changes you wish to make could still be made at our July meeting.

2. I enclose a list of research projects and papers written in the framework of such projects or independently from them. In each case we show the initials of two people who would review a particular paper.

3. I am sending under separate cover some material relating to Bank research. You will also receive the papers that are shown on the lists without a star. Finally, you will receive a folder containing information on each research project that has been assigned to you.

*More trade
More internal.*

Output hist. "S" denotes output which has been sent to Panel Members indicated by initials, and to chairman.

#136, 300.
(Balassa)

PS:
Start date:
Status:
Total Auth.

Balassa
Big
Ongoing
Total

*
Development Strategies in Semi-industrial Countries (670-01)

EB JD

Self

- S. Balassa, Bela. Export Incentives and Export Performance in Developing Countries: A Comparative Analysis. World Bank Staff Working Paper No. 248. January 1977. (Catalog No. XVII/433).
- S. _____ . "Reforming the System of Incentives in Developing Countries." World Development 3 (June 1975): 365-82. Spanish translation in Cuadernos de Economia (December 1974): 33-46. World Bank Reprint Series No. 22.
- * _____ . "Trade, Protection, and Domestic Production: A Comment." In International Trade and Finance: Frontiers for Research, edited by Peter B. Kenen. Cambridge: Cambridge University Press, 1975.
- * Balassa, Bela, and Schydrowsky, D.M. "Indicators of Protection and of Other Incentive Measures." In The Role of the Computer in Economic and Social Research in Latin America, edited by Nancy D. Ruggles. New York: National Bureau for Economic Research, 1974.
- * Balassa, Bela, and Sharpston, Michael. Export Subsidies by Developing Countries: Issues of Policy. World Bank Staff Working Paper No. 238. June 1976. (Catalog No. XVII/431). Forthcoming in Commercial Policy Issues, No. 3 (1977) and in World Bank Reprint Series.
- * Kim, Kwang Suk, and Westphal, Larry E. Industrial Policy and Development in Korea (in Korean). Korea Development Institute (KDI) Research Series, Vol. 9. Seoul: KDI Press, 1976. Revised: Bank Staff Working Paper No. 263, August 1977.
- S Balassa, Bela, "Exports and Economic Growth: Further Evidence" Journal of Development Economics, June 1978.
- Country studies on Argentina, Colombia, Israel, Singapore, Taiwan.

Note: All above items are incorporated into a volume which will be available in the beginning of July.

In complete: Completion date: ?

~~\$~~ 40,000

International Model (670-07)

EB RN

*[1] Ginsburgh, Victor, and Waelbroeck, Jean. "Computational Experience with a Large-Scale General Equilibrium Model of the World Economy." In Computing Equilibria How and Why (forthcoming).

S [2] Ginsburgh, Victor. A General Equilibrium Model of World Trade, Part I: Full Format Computation of Economic Equilibria. Cowles Foundation Discussion Paper No. 412. New Haven, Conn.: Yale University, 1975.

S [3] _____ . A General Equilibrium Model of World Trade, Part II: The Empirical Specification. Cowles Foundation Discussion Paper No. 413. New Haven, Conn.: Yale University, 1975.

*[4] _____ . "Linear Programming Formulation of International Trade Mechanisms and Trade Theory." In Quantitative Studies of International Economic Relations, edited by H. Glejser, Amsterdam and London: North-Holland Publishing Company, 1976.

Waelbroeck/Ginsburgh

Complete
Not v. imp. for review
technically incomplete
but largely over

Complete: ? (Not technically)
Still not filed.
Status questionable

Expansion of Manufacturing for Exports
in Developing Countries (670-19)

JD GB

- S [1] Ozawa Terutomo. "Labor Resource Oriented Migration of Japanese Industries to Taiwan, Singapore and South Korea. IBRD Economics Staff Working Paper No. 134, August 1972.
- [2] Chang, Y.S. "An Analysis of the Offshore activities of the Japanese Electronics Industry". March 1973.

\$4,500
(Baranson)

7/27/73 (Westphal (Hughes))
X Complete ✓
Complete

Industrialization and Trade Policies for
the 1970s (670-20)

JD GB

- [1] Helen Hughes, ed., "Prospects for partnership: Industrialization and trade policies in the 1970's", The Johns Hopkins University Press, Baltimore, 1973.
- [2] Review in Journal of International Economics, 1974.

*Complete looking
at review*

\$17,000

(Helen Hughes)

Complete; ~~Estimated?~~

Export Promotion and Preferences: India
(670-21)

KP

KJI

- [1] The Impact of the Generalized System of Preferences on India's Exports is being revised and edited, and will be released as a working paper.
- [2] The Export Development and Promotion Policies in India. Prepared for the Resident Mission in India.

(LW, HH shop
- Pow)
Budget?

Helen Hughes / David Wall
\$22,000.

Complete; Evaluated.

Economies of Scale and Tariff Levels
(670-22)

EB

KJI

- [1] Economies of Scale and Tariff Levels: completed chapters.
- [2] Some Aspects of Industrial Policy and the Investment Code in the Ivory Coast. West Africa regional office working paper.

*Garry Pursell book
is complete even though "complete"
Book \$16,000 Pursell.
Not completed*

Scope for Capital-Labor Substitution in the
Mechanical Engineering Industry (670-23)

KP EB

- * [1] Korea Institute of Science and Technology. "Final Report on a Study of the Scope for Capital-Labor Substitution in the Mechanical Engineering Sector", February 1973 (F6-400-2).
- S [2] Rhee, Yung W., and Westphal, Larry E. "A Micro Econometric Investigation Choice of Technology", Journal of Development Economics 4, September 1977, and Discussion Paper 19, Development Research Center, September 1976.
- S [3] Nam, J.W., Rhee, Y.W., and Westphal, L.E. "Data Development for a Study of the Scope for Capital-Labor Substitution in the Mechanical Engineering Industries", February 1973.
- S [4] Rhee, Y.W., and Westphal, L.E. "Institutional and Economic Criteria for the Choice of Technology in Developing Countries", June 1978.

* This is an earlier draft of [3].

Reasonably good
look at some
output
Fairly successful.
Quite a big project.
Incomplete

\$127,000

Programming in the Manufacturing Sector
(670-24)

KP

EB

- S* [1] Balassa, Bela, and Stoutjesdijk, Ardy. "Economic Integration among Developing Countries." Journal of Common Market Studies 186 (September 1974). Also World Bank Reprint Series No. 30 (Catalog No. XVI/428).
- S (2) Kendrick David and Stoutjesdijk, Ardy. "The Planning of Industrial Investment Programs, A Methodology. Volume 1 in The Planning of Investment Programs (edited by Alexander Meeraus & Ardy Stoutjesdijk).
- S* [3] Choksi, Armeane M., Meeraus Alexander & Stoutjesdijk, Ardy. "The Planning of Investment Programs in the Fertilizer Industry", Volume 2 in The Planning of Investment Programs.
- S* [4] Working Paper No. 269. (?)
- S* [5] Westphal, L.E. and Rhee, Y.W. "The Allocative Consequences of Economies of Scale." IBRD Development Research Center, Discussion Papers No. 18, January 1976. Paper presented at Econometric Society Session titled "Comparisons of Economic Structure," 1975 ASSA Meetings, December 1975. (Note: An expanded version is to be part of Part 4 of Stoutjesdijk-Westphal monograph [7].)
- S* [6] Westphal, L.E. "Methodology of Investment Planning in the Non-Process Industries," February 1976. Paper presented at the OECD/IBRD Joint Seminar on Industrial Programming, Yugoslavia, March 1976. (Note: This is a draft chapter of Stoutjesdijk-Westphal monograph [7], for Part 4.)
- S* [7] Stoutjesdijk, Ardy, and Westphal, Larry, (eds.) Industrial Investment Analysis under Increasing Returns. (available chapters).

Enormous
Larry W.
Budget?

\$ 200,000 +

* To Chairman only

Industrial Capacity Utilization in Selected
Latin American Countries (670-25)

KP

EB

S Schydrowsky, Daniel M. Capital Utilization, Growth,
Employment and Balance of Payments and Price
Stabilization. Discussion Paper Series No. 22
Boston, Mass.: Boston University, December 1976.

*Other papers as listed in Final Report (included here).

Fred Moore.
Complete in essence.
Final Report.
~~670~~

Why no
RPO

documentation?

No completion report.

Employment and Capital Labour Substitution
(670-54)

KP

RN

- *[1] Singh, S.K. Evaluation of Employment Prospects in LDCs, October 1970.
- *[2] _____ . Possibility and Implications of Employment Promotion; Aggregate Production Function, and Causes of Growth, February 1971.
- ~ [3] Pack, Howard. Employment and Industrial Growth - Some Cross-Section Results 1953-63, May 1971.
- \ [4] Ranis, Gustav. "Industrial Sector Labor Absorption", Economic Development and Cultural Change, Vol. 21, No. 3, April 1973. Also in World Bank Reprint Series, No. 6.
- *[5] Singh, I.J., Day, Richard. Capital-Labour Utilization and Substitution in Punjab Agriculture, March 1972.
- [6] Thorbecke, E., and Sengupta, Jati. A Consistency Framework for Employment, Output and Income Distribution Projections Applied to Colombia, January 1972.
- *[7] Mundlak, Yair, and Tropp, Z. Distortion in the Factor Markets and the Short Run Equilibrium, May 1973.
- [8] Mundlak, Yair. Estimation of Production Functions: A Survey, June 1973.
- *[9] _____ . Functional Forms of Production Functions, May 1973.

*Completed
Ary in charge
\$90,000
Completed*

Financing of Small-Scale Industries
(670-77)

JD

GB

- [1] Kochav, D., et al. Financing the development of small-scale industries. November 1974. v, 41 p. Mimeo (WP191).
- *[2] 8 country annexes.

Westphal / Angles
\$ 35,000

Economic Development of East and Southeast
Asia (670-79)

KJI

JD

- [1] Draft final report - August 1974.

Complete?
Disappointing

Industrial Policies and Economic
Integration in West Africa
(670-87)

GB KJI

- S [1] Balassa, Bela, "The 'Effects Method' of Project Evaluation." Oxford Bulletin of Economics and Statistics, November 1976, pp. 219-32. French translation in Annales Economiques, 1977 (11). World Bank Reprint Series No.
- S [2] "The 'Effects Method' of Project Evaluation Once Again," Bulletin of the Oxford University Institute of Statistics, November 1977, pp. 345-53. French translation in Annales Economiques, 1977 (11). World Bank Reprint Series No.
- S [3] "Comparative Advantage and the Prospects for Economic Integration in West Africa", paper prepared for the Colloque sur l'integration en Afrique de l'Ouest held in Dakar, Senegal in March-April 1978.
- S [4] Monson, Terry D., and Pursell, Garry. An Evaluation of Expatriate Labor Replacement in the Ivory Coast. Discussion Paper No. 49. Center for Research on Economic Development, University of Michigan (April 1976). French translation in L'Actualite Economique (June 1977). To be published in Journal of Development Economics (forthcoming).
- S [5] Pursell, Garry. "Cost-Benefit Analysis of Foreign Capital and Expatriates in the West African Community." Paper presented at the International Conference on the Economic Development of the Sahelian Countries, Montreal, October 1977.
- [6] Shephard, Geoffrey. Mali Country Study.

* Other Country Studies available in Draft: Ghana, Ivory Coast, Senegal.

*Balassa
book complete.
with looking at.*

*\$94,000 (Pursell, Shephard
etc.)*

Industrial Capacity Utilization
(670-95)

KP EB

- [1] Hughes, Helen, et al. Capacity Utilization in Manufacturing in Developing Countries, Sept. 76, (WP242).
- [2] Lim, D. On the Measurement of Capital Utilization in LDCs. OEP (March 1976): 149-159.
- [3] Lim, D. Capital Utilization of Local and Foreign Establishments. R.E.S. (May 1976): 209-217.
- [4] Winston, Gordon. The Theory of Capital Utilization and Idleness, World Bank Staff Working Paper No. 176. April 1974. Also in the Journal of Economic Literature. 12 (December 1974): 1301-1320.

*Moderately Successful
with output.*

Complete: \$57,000

Patterns of Industrial Development
(671-05)

EB

KJI

- *Poduval, Narayana. Data Bank and Data Management Programs for Analysing Patterns of Industrial Development. The World Bank: Development Economics Department, Economics of Industry Division, April 1978.
- S Prakash, Vinod. Measuring Industrial Exports: A Comparative Statistical Study of Variations Arising from Differences of Definition. World Bank Staff Working Paper No. 225. February 1976 (Catalog No. II/339).
- S _____ . Statistical Indicators of Industrial Development: A Critique of the Basic Data. World Bank Staff Working Paper No. 189. September 1974 (Catalog No. II/304).
- S V. Prakash, "An Overview Paper on RPO 671-05 'Patterns of Industrial Development'," May 1977. Paper prepared for the Departmental Review Panel.

~~Butter~~
Prakash.
?

Promotion of Nontraditional Exports
(671-10)

EB

GB

- * [1] Garcia, Hector A. Brazil: Development Policy for Exports of Manufactures. ECLA Staff Report.
- * [2] Monti, Angel. Exports of Manufactured Goods: Argentina. ECLA Staff Report
- * [3] Bitran, Daniel. The Export of Manufactures in Mexico and Its Promoting Policy. ECLA Staff Report
- * [4] Pinera, Jose. Export Promotion Policies in Colombia. ECLA Staff Report.
- * [5] Ffrench-Davis, Ricardo and Pinera, Jose. Export Promotion Policies in Developing Countries. ECLA Staff Report.
- * [6] Michaely, Michael. Export Promotion Policies in Israel, Bank Staff Paper.
- * [7] Westphal, Larry, E. Korea's experience with export-led industrial development. Mimeo (WP249), February 1977.
- * [8] Dubey, Vinod. Yugoslavia: Commodity Exports and Export Policies. Bank Staff Paper.
- * [9] de Vries, Barend. Export Growth in the World Environment: The Case of Latin America. Bank Staff Paper.
- * [10] Wolf, Martin. Export Promotion Policies in India. Bank Staff Paper.
- * [11] Balassa, Bela. Export Incentives and Export Performances in Developing Countries: A Comparative Analysis. (WP248), January 1977.

Políticas de Promoción de Exportaciones. ECLA, Chile
E/CEPAL/1046, October, 1977.

S.
(Vol I)

Worth looking at:
Budget;

A Comparative Study of the Sources of
Industrial Growth & Structural Change
(671-32)

KP RN

- S [1] Chenery, Hollis B. Transitional Growth and World Industrialization. Presented at the Nobel Symposium on the International Allocation of Economic Activity, Stockholm, June 1976.
- S [2] Syrquin, Moises. Sources of Industrial Growth and Change: An Alternative Measure. Presented at the European Meeting of the Econometric Society, Helsinki, August 1976.
- S [3] Chenery, Hollis and Moises Syrquin. A Comparative Analysis of Industrial Growth. Presented at the Fifth World Congress of the International Economic Association on Economic Growth and Resources, Tokyo, August/September 1977.
- S [4] L.E. Westphal, "Progress Report on A Comparative Study of the Sources of Industrial Growth and Structural Change," August 4, 1977.
- S [5] Balassa, Bela "Accounting for Economic Growth: The Case of Norway" World Bank Development Research Center Discussion Paper No. 17 and Oxford Economic Papers (Forthcoming).

*Output volume
indices of the + the.*

Export Incentives in Developing Countries
(671-35)

KJI RN

[1] No reports.

Balassa
(?) Multi country

Appropriate Industrial Technology
(671-51)

KP RN

- S 1. H. Pack, "The Macroeconomic Effects of Appropriate Choice of Technology," December 10, 1977 (first progress report).
- S 2. H. Pack, "The Capital Goods Sector in LDCs: A Survey," May 1978.

Wesphal / Pack ✓

Marketing Manufactured Exports
(671-56)

GB

KJI

[1] No reports.

Small-Scale Enterprise Development
(671-59)

KJI RN

- S [1] Anderson, Dennis 'Estimating the Economic Benefits of Small Scale Enterprise Credit Projects' May 12, 1978.
- S [2] M. Cortes, "Research Proposal on Small and Medium Scale Industries," May 18, 1977.

*Dennis / Separate
More micros*

Small Enterprise Financing: Role of Informal
Credit Market (671-65)

JD

GB

[1] No Reports. First draft expected March 1979.

S

Research Proposal

John Turing Paper

Effects of Increased Imports of Manufactured
Goods from Developing Countries (671-67)

KJI JD

[1] No reports. First draft expected August 1979.

Baldwin Project.

Key Institutions and Expansion of
Manufactured Exports

(671-68)

GB

JD

No reports

Marketing

Capital Market Imperfections and Economic
Development (671-69)

JD GB

- S [1] Bhatt, V.V. Interest Rate, Transaction Costs and Financial Innovations, Domestic Finance Studies, No. 47, World Bank, Public and Private Finance Division, Development Economics Department, January 1978; also to be presented at the Western Economic Association Conference in June 1978 and to be published in part in Development Digest (September 1978).
- S [2] Roe, Alan R. Some Theory of the Financial Intermediation in Less Developed Countries, Domestic Finance Studies No. 50, World Bank, Public and Private Finance Division, Development Economics Department, May 1978.
- S [3] Saito, Katrine A., and Villanueva, Dan P. Portfolio Determinants of Commercial Bank Earnings in Selected Asian Countries, Domestic Finance Studies No. 49, World Bank, Public and Private Finance Division, Development Economics Department, March 1978; also to be presented at the Western Economic Association Conference in June 1978.

Industrial Development & Trade Panel

Non RPO Papers

Industrial Programming

KP RN

- S Choi, H. and Westphal, L.E., "Outline of the Mexican Plant Equipment Planning Study," November, 19, 1976.
- S Westphal, L.E., "UNDP Proposal - Mexico Plant Equipment Complex Design Study," March 14, 1978.
- S Cremer, J., "Planning Interdependent Production Processes with Increasing Returns to Scale: Some Theory and an Algorithm," December 1976. Ecole Polytechnique, Laboratoire d'Econometrie.

Small-Scale Industry

KP RN

- S O'Mara, G., "An Econometric Analysis of the Role of Small-Scale Industry in Brazilian Industrialization, 1949-1970," June 1976.
- S _____, "The Role of Small-Scale Industry in Recent Brazilian Industrialization," April 1978.

Trade - Empirical

EB GB

- S Keesing, D. and Plesch, P., "Recent Trends in Manufactured and Total Exports from Developing Countries," June 6, 1977.
- S Plesch, P., "Developing Countries' Exports of Electronics and Electrical Engineering Products," February 14, 1978.
- S Keesing, D., Plesch, P., and Triner, G., "Developing Countries' Exports of Textiles and Clothing: Perspective and Policy Choices," May 31, 1978 (first draft).

Trade Policy

JD RN

- S Balassa, Bela, "Tariffs and Trade Policy in the Andean Common Market", Journal of Common Market Studies, December 1973, pp. 176-195. Spanish translation in Revista de la Integracion, May, 1974, pp.7-34
- S _____, "Types of Economic Integration", in Economic Integration, Worldwide, Regional Sectoral (Fritz Machlup, ed.) Proceedings of the 4th Congress of the International Economic Association held in Budapest, Hungary in August 1974, London, Macmillan, 1976, pp. 17-31.
- S _____, "Effects of Commercial Policy on International Trade, the Location of Production, and Factor Movements" and "Reply to Comments" by Tibor Scitovsky and Melwyn B. Krauss in The International Allocation of Economic Activity, pp. 230-58, 270-74. (Bertil Ohlin, Per-Ove Hesselborn, and Per Magnus Wijkman, ed.) Proceedings of a Nobel Symposium held at Stockholm in June 1976. Macmillan, London, 1977.
- S Balassa, Bela, "A 'Stages' Approach to Comparative Advantage," (forthcoming).
- S _____, "World Trade and the International Economy: Trends, Prospects and Policy", World Bank Staff Working Paper No.
- S _____, Policy Reform in Developing Countries, Oxford, Pergamon Press, 1977.
- S Sharpston, M., "International Subcontracting," May 1974. Bank Staff Working Paper No. 181. Published: World Development, 4, No. 4, 1976, pp. 333-337.

Industrial Technology

KP RN

- S Cooper, C., "Policy Interventions for Technological Innovation in Less Developed Countries," June 1976.

OTHER DOC.

OFFICE MEMORANDUM

TO: Mr. S. Bery

DATE: July 12, 1978

FROM: F. Stephen O'Brien *FSOB*

SUBJECT: Applied Research by Regional Offices

1. With reference to Mr. Balassa's memo of June 29 on the above subject, the following reports on Eastern Africa CPI countries may be of interest to the external panel on research in industrial development and trade:

(a) Tanzania Industrial and Mining Sector Survey, (647-TA), March 31, 1975.

(b) Tanzania Basic Economic Report (1616-TA), December 1977, Annex V, Industry: Perspectives and Strategic Choices.

cc: Messrs. Balassa
Gulhati

OFFICE MEMORANDUM

TO: Mr. B. Balassa, DRC

FROM: Dale Weigel, CDD *Dale Weigel*

SUBJECT: Research in Industrial Development and Trade

DATE: June 26, 1978

You might wish to include in your list two studies supported by this Department:

- 1) Michel Amsalem - Technology Choice in Developing Countries: The Impact of Differences in Factor Costs. Submitted as a DBA thesis to Harvard Business School, June 1978
- 2) Stephen Guisinger - Industrial Protection in IFC Projects, December 30, 1975

Copy to Mr. Richardson (o/r)

DRW:eb

OFFICE MEMORANDUM

TO: Mr. S. Bery, VPD

DATE: July 11, 1978

FROM: Willem Maane, Senior Economist, EA2DR *Wm*

SUBJECT: Applied Research by Regional Offices

1. Mr. Balassa's memorandum to the Chief Economists, dated June 29, 1978, on the above subject refers.

2. Please find below a list of reports relating to Industrial Development and Trade, which might be of interest to the external review panel.

✓ Mauritius: Basic Economic Report, No. 1509-MAS, February 22, 1978, Annex I: The Sugar Industry in Mauritius; Annex III: The Manufacturing Sector.

✓ Madagascar: Economic Memorandum on Current Economic Position and Prospects and Selected Development Issues, No. 1099a-MAG, December 20, 1976, Annex II: Manufacturing; Annex III: The Parastatal Sector.

✓ Zaire: The Economy of Zaire, No. 821-ZR, July 23, 1975, Volume II, Chapter II: Mining; Volume II, Chapter III: Manufacturing.

✓ Ethiopia: Recent Economic Performance and Future Prospects, 9a-ET, June 15, 1973, Volume II: Cottage and Small-Scale Industry in Ethiopia.

Ethiopia: Small-Scale Cottage and Handicrafts Industries Development in Ethiopia, Report No. 1335a-ET, February 1977.

WMaane:med

cc. Messrs. Balassa
Gulhati

OFFICE MEMORANDUM

TO: Mr. Bela Belassa, VPD

DATE: June 20, 1978

FROM: E. Bevan Waide, ASNVP *EW*

SUBJECT: Industrial Development and Trade Panel

With reference to your memo of June 14 on the lists of research topics, my first reaction is that a lot of applied work has been done -- I attach an inventory of work on industry in India and can send you similar lists on other South Asia countries. Some of these may fall vaguely into your category "policy and operational applications of Bank research". Please let me know if you think the External Panel will be interested.

Att.

cc: Messrs. Gordon, Gulhati, Fuchs, Richardson, Westphal, Moore

This paper presents an overview of the planning process and development prospects for the water supply and sewerage sector. Both urban and rural components are examined in terms of present service levels, development patterns and financing policies and targets for the VI Five-Year Plan.

Charles Taylor, India - Issues in the Telecommunications Sector, August 1976, 19 pp. (Mr. Taylor's Office).

1. The paper reviews the sector's development and the impact of Bank involvement.
2. Sectoral issues, government policies and major issues that affect the role of the Bank Group are discussed.
3. It gives recommendations for Group lending in this sector.

John Wall, India Oil and Natural Gas Sector Review (Grey, No. 1172-IX), May 11, 1976, 21 pp.+.

This report emphasizes the impact of the 1973 oil embargo on this sector in India. Major issues addressed are:

1. Institutions (such as the Oil and Natural Gas Commission and Oil India Ltd.);
2. Exploration and Development;
3. Production - Crude and Natural Gas;
4. Refining;
5. Consumption;
6. Pricing;
7. Imports;
8. Investment; and
9. The financial impact of Bombay High

E. Industry and Transport

Nancy Barry, India - Proposal for a Small Industry Engineering Project, March 1978, 40 pp. (Joan Voigt's Office).

This paper discusses briefly many characteristics of the small scale industry engineering subsector. Included are: its importance in employment; geographical distribution; efforts; capital requirements and GOI policies to name a few. A discussion of the project design follows with marketing, materials, finance and product lines as major topics for review. Section IV highlights alternative project designs in three states, they are joint products

subproject, subcontracting subproject and basic need subproject. The paper and possible next steps for project preparation concludes the paper covering analysis of small units, assessment of support agents, and analysis of exports and local market potential.

Nancy Barry, India - Toward a Small Scale Textile Project, March 1978, 59 pp. (Joan Voigt's Office).

This paper discusses the characteristics of the handlooms and garment industries in Section I. Local markets, exports and import restrictions are taken up in Section II. Government policies and programs on the major topic of Section III including a discussion of general support programs, special schemes and cooperatives.

Industrial Projects Department, India - Survey of the Steel Forging Industry, 32 pp. (Grey, No. 432-IN).

1. The paper describes the steel forging industry structure.
2. It reviews industry performance, sources of high prices of Indian forgings and operational attributed of efficient firms in the industry.
3. The export situation and a development strategy are outlined.

Industrial Projects Department, Survey of the Tractor Manufacturing Industry - India, May 16, 1973, 22 pp. (Grey, No. 166-IN).

This is a background paper in connection with the Industrial Imports Credits for India. The paper examines the sector framework highlighting history, government policies and institutions and structure of the industry. An analysis of performance is given with production plant operations, financial and economic performance and demand forecast and expansion plans as major topics of discussion.

Mr. M. Iskander, India: Survey of the Textile Machinery Industry (with a note on Indian Textile Industry), December 1975 (Yellow, No. 970-IN), 56 pp.

1. This survey examines mainly different machineries, plant operations and pricing to show the industry structure and performance.
2. It reviews the export situation.
3. The development strategy is reviewed.
4. Policy recommendations to improve the international competitiveness of the industry are suggested.

Mr. E. Loeschner and mission of DFCD, India - Internal Small Enterprises in Selected Sectors, 19 pp., September 1976.

1. This paper reviews the seven sub-sectors of the informal small industry in light of the Indian experience with institutional support to the selected small-scale enterprises (SSE).
2. A general framework for assisting informal SSEs is outlined.

National Council for Applied Economic Research, Background Note on the Industrial Situation, 1977, 77 pp.+ (John Wall's Office).

This paper studies industrial growth in India from 1970 to the present. A major topic of discussion is the structure and composition of manufacturing. Other areas of study are capital formation in the organized sector, investment in private corporate sector, patterns of investment, profitability, factors motivating investment and the new industrial policy.

Mr. A. Pinnel-Siles, India - Tax Structure and Incentives for Private Corporate Investment, November 11, 1977, 51 pp. (John Wall's Office).

This paper analyzes broad patterns related to the private corporate sector. Section III studies factors which have influenced investment in the corporate sector. Section IV analyzes the tax structure and fiscal incentives for investment. The main conclusions are summarized in the last section.

Sunanda Sengupta, Trends in Profitability in the Corporate Sector 1965-76, November 23, 1977, 17 pp. (John Wall's Office).

This paper compares corporate profits as a percentage of capital employed, gross profits as a percentage of net sales and profits after tax as a percentage of net worth. Conclusions are that the larger the capital size and scale of production, the larger the profitability. Public limited companies show higher profitability ratios than private limited companies.

Francine Bougeon-Maassen, Urban Public Finances in Developing Countries: A Case Study of Metropolitan Bombay, August 1976, Draft (Roger Grawe's Office), No. 670-70, 159 pp.

1. Administration and organization of the city.
2. Fiscal structure and budgeting.
3. Expenditure structure and growth and capital financing.
4. Property taxes.
5. Education finance.
6. Health, welfare, housing and transport.

Central Projects Staff, Study: Developmental Impact of the Industrial Credit and Investment Corporation of India Limited, January 17, 1976, 15 pp.

1. The business environment, policies and industrial strategy, planning, licensing, and trends from 1955 to 1972 at length.
2. The Institutional environment covers ICICI's role, other financial institutions and government policy.
3. ICICI's Operations are examined in the light of objectives, internal constraints and external constraints.
4. ICICI's image and selected results are also reviewed.

Central Projects Staff, Fertilizer Sector Policy Paper, July 1975 (White, subsequently included in grey cover appraisal report on Fertilizer Industry Credit).

H. Choi (Consultant-Report), The Electrical Equipment and Cable and Wire Industries (A Background Note to the Eleventh Industrial Imports Credit), February 3, 1976, 15 pp.

Review of the Electrical Equipment and Cable and Wire Industries to recommend an active program for improvement of sectoral policies and industrial performance.

H. Choi (Consultant-Report), Export Potential of the Machine Tool Cutting and Small Tool Industry (A Background Note for the Eleventh Industrial Imports Credit), January 1976, 34 pp.

This report reviews the subject and recommends an action program for improvement of sectoral policies and industrial performance.

P.D. Henderson and Donald E. Brown, Report on the Indian Fertilizer Program and the Fifth Plan, April 30, 1973 (Memorandum, India Division Files).

Consumption, future supplies (i.e. domestic production and imports), the supply and choice of feedstock, expansion in oil refining) and possible action by the Bank Group are the major topics of the Indian Fertilizer Program.

Industrial Projects Department, Survey of Commercial Vehicle Industry - India (Grey, No. 165-1R), May 16, 1973, 50 pp.

This is a background paper in connection with the Industrial Imports Credit for India. The sectoral framework is outlined giving a review of history, government policy and institutions, structure, fixed assets, ownership, employment and vertical integration. Analysis of performance is examined. Production, capacity utilization, plant operations, financial performance, economic costs and benefits, and exports are the major topics for discussion. Expansion plans and principal recommendations are also reviewed.

Industrial Projects Department, India - Survey of the Foundry Industry (Grey, Report No. 432-1N), April 25, 1974, 57 pp. (Reports Desk).

1. Reviews the structure and the performance of the steel and iron foundries.
2. The export promotion scheme and the export prospects of castings for the industries are discussed.
3. Major recommendations for rehabilitation and modernization of the industries are outlined.

South Asia Projects, Certain Aspects of the Indian Steel Industry, (Grey, No. AS-111a), June 29, 1966, 30 pp.+.

This report describes the history, the plant performance, the control system and the supply and demand situation of the Indian steel industry at that time.

South Asia Projects Department, Thirteenth Railway Project (Report No. 787a-1N), July 28, 1975, Annex 2, Indian Railways, 11 pp. (B. Alisbah's Office).

Annex 2 features an overall view of the Indian railway network. Major topics discussed are:

- A. Organization, management and staff;
- B. Accounts, costing and audit;
- C. Rates and fares;
- D. Property (i.e. general features, tracks, bridges, locomotives, passenger vehicles, freight wagons, scrapping policy and procedures, and workshop and running shed operations);
- E. Manufacturing units;
- F. Operating performance;
- G. Performance under previous credits; and
- H. Railway planning.

Charles Taylor, India - Interim Review of Commercial Banking and Small-Scale Sector, February 12, 1976, 8 pp. (Mr. Taylor's Office).

1. The importance and the organization of the commercial banks' assistance to the small scale sector are reviewed.
2. The major schemes of the commercial banks are briefly outlined.

E.B. Waide (Consultant) and E. Loeschner, Development Report of the Industrial Credit and Investment Corporation of India Ltd., January 21, 1974 (Green, Reports Book), 70 pp., Review of ICICI's development Report.

Transportation Division, South Asia Projects, Discussions on Transport Sector, Planning and Management with Government of India: full report, July 1974, 35 pp.

An identification of the number of problems in sector planning and management in the transport sector; report proposes a number of means for strengthening institutions with the objective of insuring that investment decisions in the transport sector are based on the examination of feasible alternatives.

F. Human Resources and Urban Development

Robert Cassen, Human Resources, 1978, Draft, 125 pp. (C. Wallich's Office).

The paper consists of five major areas of concentration. They are:

1. India's demographic profile including population size and growth, age structure and demographic characteristics;
2. Population projections;
3. Family planning policies up to 1976;
4. Nutrition with discussion of the extent of malnutrition in India; and
5. Health, the plan and the problem.

Ravi Gulhati, India's Population Policy: History and Future, August 1977, World Bank Staff Working Paper No. 265, 47 pp.

Section I examines fertility from 1951-71. Two factors are of major significance -- the rising marriage age and the declining marital fertility. Section II covers the New Population Policy - i.e. the national commitment to family planning as a political objective. The demand for family planning and minimum marriage laws is discussed. Section III covers issues and options such as better management (delivery of service, use of field leadership, staffing difficulties) and better allocation of budgetary resources.

Stephen P. Reyneman, Investment in Indian Education: Uneconomic? March 29, 1978, 15 pp. (J. Voigt's Office).

This paper provides evidence for further investment in education projects in India. Topics for discussion include speculations on comparative trade advantages, regional distribution of education, enrollments, and per

AIDE-MEMOIRE

A Medium-Term Work Program in the Trade and Commodities Area

Bela Balassa

1. The purpose of this report is to formulate a medium-term (3-4 years) work program in the trade and commodities area. In formulating such a program, the basic question to be answered is what the Bank needs to know in this area. The report will examine topics of interest to the Bank, followed by a discussion of suggested priorities.
2. The first necessity is to monitor trends in international trade and to analyse future prospects as regards export volume and prices for major commodities as well as for individual developing countries. Export prospects will depend on a variety of factors, including objective conditions affecting supply (the availability of natural resources, unskilled, skilled and technical labor, and managerial knowhow) and demand (changes in income and consumption patterns); the policies followed by the developed and the developing countries; and the institutional framework encompassing the existence of transportation and communication facilities, marketing channels and the role of multinational corporations. Apart from examining the effects of these factors on exports, one needs to ascertain the impact export growth has on particular policy targets such as economic growth and employment. This, in turn, calls for an evaluation of alternative policies, including the choice between export orientation and import substitution in the developing countries and the choice between a liberal and a protectionist trade policy in the developed countries.
3. Bank work in the trade and commodities area consists of data collection and analysis, the preparation of issues and policy papers, and research. These will be considered under various subject headings below. The Appendix contains a listing of ongoing and planned RPO and non-RPO studies which are referred to

by title and by number in the text.

Trends in International Trade

4. The International Economy Division and the Commodities and Export Projections Division of the Economic Analysis and Projections Department (EPD) prepare world trade matrices, analyze trends in the trade of the developed countries, developing countries, and centrally-planned economies, and review developments in the exports of primary commodities. The Economics of Industry Division of the Development Economics Department (DED) examines trends in the manufacturing trade of the developing countries.

5. EPD prepares annual reports under the title "Commodity Trade and Price Trends." A separate report is prepared by DED on trade in manufactures. In order to ensure greater comparability, the increased cooperation of the two departments would be desirable and the marging of their reports should be envisaged.

Commodity Work

6. Data collection and analysis, leading to forecasts of the export volume and prices of major primary commodities, is carried out by the Commodities & Export Projections Division. Progress has recently been made in formalizing work in the form of models and in ensuring the consistency of country forecasts for individual commodities.

7. Work on international trade in foodgrains continues in collaboration with the Agricultural Projects Department. Further work in this area could be usefully done, focusing on the economic effects of national and regional selfsufficiency in foodgrains and on possible implications for foreign aid and the government budget. An in-house study of energy policies of the developing countries carried out in collaboration with CPS, is under way and will lead to the preparation of an issues paper (2.3).

8. The Commodities & Export Projections Division covers processed foods, minerals, and forest products as well. Work on other manufactured goods has begun in the Economics of Industry Division of the Development Economics Department (DED). In-house studies on electronics and electrical machinery (2.5), textiles and clothing (2.6), and non-electrical machinery (2.7) are in preparation.

9. With the growing importance of manufactured goods in the exports of the developing countries, work on trade in the major commodity groups of interest to these countries would need to be carried out on a continuous basis. The commodity groups in question include textiles, clothing, shoes, electrical appliances, non-electrical machinery, electronics and transport equipment, all of which are actual or potential exports of the developing countries.

10. Among intermediate products, steel, petrochemicals, fertilizer, and pulp and paper offer interest to the developing countries from the point of view of exports and import substitution as well. In the case of these industries, the first priority is to consolidate information on new investments, together with demand projections, in a model framework, so as to serve as a guide for Bank investments and policy advising.

11. More generally, work on manufactured goods should aim at indicating changes in the structure of world industry and to serve the Bank in performing its policy advisory role. This would require an initial period of the accumulation of knowledge, where use needs to be made of information collected by UN agencies and other organizations. While work on manufacturing industries would need to be phased in over time, even a modest beginning would require an increase in available staff. At the same time, staff needs in DPS will depend on the

division of labor with other Departments that have done work on certain intermediate products in the past.

Commodity Agreements and the Integrated Program

12. Issues relating to commodity agreements were considered last year in a paper by Dragoslav Avramovic and Karsten Laursen. In turn, the gains and losses, and their distribution between producers and consumers, that may result from price stabilization agreements and cartels are being studied under alternative assumptions in RPO 671-09, "Natural Resources and Planning: Issues in Trade and Investment" (1.4).

13. It would further be desirable to investigate the existing system of marketing primary commodities and the implications of this system for the distribution of benefits among producers, traders, and consumers. This may take the form of analyzing the economic implications of the UNCTAD study on cocoa; associating the Bank with the UNCTAD study on tea; or carrying out work on hard fibers.

Patterns of Specialization

14. Investigations of the impact of objective conditions on the pattern of international specialization and on changes in this pattern are of interest for gauging prospective changes in the export composition of developing countries. In RPO 671-05, "Patterns of Industrial Development," broad changes in the composition of trade in manufactured goods are investigated (1.3). In turn, "A 'Stages' Approach to Comparative Advantage" (World Bank Staff Working Paper No. 256) has examined the relationship between the accumulation of physical and human capital and the composition of manufactured exports. Further work would need to be done on the sequencing of trade patterns for countries that presently rely chiefly on primary exports.

15. Studies planned by the Commodities & Export Projections Division on the processing of primary export commodities (2.1) and on the export diversification prospects of the smallest and the poorest developing countries (2.2) would respond to this need. The former would take the form of in-depth studies of selected commodities to analyze the potential gains from processing and the obstacles to the further transformation of raw materials and foods in primary-producing countries; the latter would consist of in-depth studies of representative countries, where the exportation of primary products or manufactures offer possibilities.

16. It would be of further interest to analyse the sequencing of exports in natural resource-rich countries. Country studies may be devoted to the prospective transformation of the export structure of oil-producing countries, such as Iran or Venezuela, and of middle-income countries in whose exports primary products predominate, such as Kenya and Peru.

Developing Country Policies

17. The trade policies followed by developing countries that have established an industrial base are analyzed in RPO 670-01 "Development Strategies in Semi-industrial Countries" (1.1). The findings of this research project have been incorporated in "Export Incentives and Export Performance in Developing Countries: A Comparative Analysis" (World Bank Staff Working Paper, No. 248), which examines the relationship between export incentives and exports as well as between exports and economic growth in countries that followed different policies. Country experiences with export promotion are summarized in RPO 671-10, "Promotion of Nontraditional Exports" (1.5) while incentives and costs in export activities are investigated in RPO 671-35, "Export Incentives in Developing Countries" (1.6).

18. Additional research on trade policy in countries that have established an industrial base is likely to bring diminishing returns. However, interest attaches to studying the efficient sequencing of import substitution and exports in particular industries and the policies aimed at manufacturing growth in non-industrial countries. The skill-acquisition process in metal manufacturing offers an example of industry studies. In turn, among non-industrial countries, Tanzania may be an interesting subject for a case study that could also consider the implications of the basic needs approach to international trade. A study of Tanzania would complement RPO 670-87, "Industrial Policies and Economic Integration in Western Africa", which provides estimates of incentives and domestic resource costs on a firm-by-firm basis for Ghana, Ivory Coast, Mali, and Senegal (1.2).

19. Finally, there is need for keeping trade policy issues in the developing countries under review for purposes of operational support. This would involve a continuing review of the treatment of export subsidies by the developed countries as well as participation in country missions. The Economics of Industry Division of DED appears to be the appropriate place for this work.

Intra-LDC Trade

20. A particular aspect of trade policies in developing countries that needs to be studied relates to intra-LDC trade. Topics of interest include experience with past integration schemes, in particular the economic effects of agreements on industrial specialization in Latin America; future possibilities for regional integration by the use of tariff preferences and by the establishment of integration projects; and the benefits and costs of preferential treatment to inter-regional trade among LDCs in the framework of collective self-reliance. A work program in this area could be determined following

the completion of an in-house investigation by EPD, leading to the preparation of an issues paper (2.4).

Institutional Factors

21. It has been alleged that the expansion of intra-LDC trade has been hindered by the lack of adequate transportation and communication facilities. This hypothesis may be tested by comparing freight rates and the cost of communication between various points in developed and in developing countries. At the same time, one would need to evaluate the costs and benefits of establishing transportation and communication facilities linking developing countries.

22. In the framework of RPO 671-35, "Export Incentives in Developing Countries" (1.6), information is also collected on marketing channels for exports. In turn, RPO 671-56, "Marketing Manufactured Exports" (1.7) examines the role of marketing in the development of Colombia's textile exports. Further work has been suggested in the framework of the proposed RPO on "Key Institutions and Expansion of Manufactured Exports", (1.8) which would consider the role of trading companies, foreign buyers, and multinational corporations in export marketing.

Developed Country Policies

23. The prospects for LDC exports depend to a considerable extent on the policies followed by the developed nations. Policies concerning the imports of primary products have been adequately studied; policies pertaining to the processing of primary products will be considered in the in-house study referred to above; non-tariff barriers to LDC exports of manufactured goods in the United States and Western Europe are being reviewed by consultants; and the in-house study on LDC exports of textiles will examine the effects of the

international textile agreements on these exports, in particular the shifts in the sources of supply that have benefited developing country exporters.

24. It would further be desirable to analyze the market constraints facing developing country exporters of manufactured products in the developed nations. In this connection, it has been suggested to reorient the research project proposed by Professor Baldwin, "Industry and Regional Effects of Increased Imports of Manufactured Goods from Developing Countries" (1.9), so as to focus on the question of market penetration by developing country exports in U.S. markets for manufactured goods. In particular, one would need to establish "danger points" that trigger protectionist pressures and, eventually, protectionist measures. Further consideration would need to be given to the replacement by developing country producers of developed country suppliers in U.S. markets and to the international division of the production process through the manufacturing of parts, components, and accessories in developing countries in which case the danger of protectionist reactions is minimized.

25. Work along these lines needs to be undertaken also for Western Europe and Japan. For Western Europe, this can be done in the framework of the research program proposed by the Brussels Centre headed by Jean Waelbroeck (1.10) to be carried out in cooperation with the Kiel Institute. It would be desirable that a parallel research project be undertaken for Japan, with emphasis on resistance to market penetration by developing countries and on changes in the international position of the Japanese textile industry.

Projecting the Exports of Developing Countries

26. A consistency framework for making medium-term export projections, incorporating trade matrices for five commodity categories and 15 regions has been constructed for purposes of the World Development Report by EPD. Future

projection work should focus on the manufactured exports of the developing countries, utilizing the results obtained in the industry studies. It would be of further interest to examine the impact of increases in the exports of the developing countries on their imports from the developed nations, in particular on their manufacturing industries (1.11).

27. Prospective changes in the manufactured exports of the developing countries are related to the changing pattern of comparative advantage as noted above. The better understanding of this process would be served by explicit modelling. Work on such a model is proposed by the Brussels Centre, but would require close cooperation with the Bank.

28. Emphasis has been given here to the need for projecting the manufactured exports of the developing countries on the basis of an analysis of the prospects for individual commodities and commodity groups. This approach is superior to making projections on the basis of past relationships between income growth in developed countries and the exports of manufactured goods from developing countries, since these exports have been affected to a considerable extent by the policies followed in the latter group of countries. Nor does the simultaneous estimation of demand and supply functions hold much promise. Such estimation gave poor results for Japan and Korea, in part because of the unreliability of export price indices.

29. However, it would be of interest to examine the cyclical pattern of this trade, in particular the effects of the 1974-75 recession and the expansion that followed on the exports of manufactured goods from the developing countries (2.8). This could subsequently be the subject of an issues paper.

Priorities for Future Work

30. Pursuing all topics of interest to the Bank in the trade and commodities area simultaneously would involve a very substantial effort. It is, therefore, necessary to indicate priorities for work to be carried out in the next 3-4 years. Priorities should be determined with a view of the Bank's operational needs in the trade and commodities area. It is suggested here that emphasis be put on the future possibilities for expanding LDC exports and on the policies necessary for export expansion.

31. This would require complementing ongoing work on primary commodities by work on manufactured goods of export interest to the developing countries, the aim being to examine the transformation of the structure of world industry, to assist the Bank in performing its policy advisory role, and to provide support to Bank investments in the manufacturing sector. These objectives would be served by establishing appropriate staff functions, supported and complemented by research. In particular, there is need for an initial accumulation of knowledge in the form of industry studies; an investigation of the market constraints facing developing countries in the developed nations; and a review of the policies followed by the developing countries themselves.

Listing of Bank Studies and Papers
in the Trade and Commodities Area

	<u>Title</u>	<u>Responsibility</u>	<u>Completion Date</u>
1.	<u>Research Projects (RPO-s)</u>		
1.1	670-01 Development Strategies in Semi-industrial Countries (Argentina, Colombia, Israel, Korea, Singapore, Taiwan)	DRC, Balassa and consultants	Jan. 1978
1.2	670-87 Industrial Policies and Economic Integration in Western Africa	DRC and DED, Balassa, Pursell, Shepherd and consultants	June 1978
1.3	671-05 Patterns of Industrial Development	EPD, Prakash	June 1978
1.4	671-09 Natural Resources and Planning: Issues in Trade and Investment	DRC and DED, Blitzler, Stoutjesdijk and consultants	June 1978
1.5	671-10 Promotion of Non-traditional Exports	LAC, Greene and consultants	March 1977
1.6	671-35 Export Incentives in Developing Countries	DRC and DED, Balassa Papageorgiou, Pursell and consultants	June 1979
1.7	671-56 Marketing Manufactured Exports	DED, Morawetz (cons)	December 1978
1.8	(proposed) Key Institutions and Expansion of Manufactured Exports	DED, Keesing, Dervis	June 1979
1.9	(proposed) Industry and Regional Effects of Increased Imports of Manufactured Goods from Developing Countries	EPD, Baldwin, consultants	December 1979
1.10	(proposed) Manufactured Exports Module	EPD, Waelbroeck, consultants	to be determined
1.11	(proposed) Impact of Developing Country Growth on Economies of Developed Countries	Waelbroeck, consultants	to be determined

	<u>Title</u>	<u>Responsibility</u>	<u>Completion Date</u>
2.	<u>Non-RPO Studies</u>		
2.1	Processing of Primary Commodities	EPD, Takeuchi and Chung	October 1978
2.2	Export Performance and Diversification Prospects for the Smallest and the Poorest Developing Countries	EPD, Singh	June 1979
2.3	Energy Policies in Developing Countries	CPS, EPD, Hoffman Friedmann	October 1978
2.4	Intra-LDC Trade	EPD, DED, Laursen, Keesing	June 1978
2.5	Developing Country Exports of Electronics and Electrical Machinery	DED, Plesch	November 1977
2.6	Developing Country Exports of Textiles and Clothing	DED, Keesing	December 1977
2.7	Developing Country Exports of Non-electrical Machinery	DED, Kanaguchi	January 1978
2.8	Sensitivity of LDC Exports to Business Conditions in Developed Countries	EPD, Schwartz and Grilli	May 1978

OFFICE MEMORANDUM

TO: Distribution list
FROM: Bela Balassa
SUBJECT: Meeting of the Trade Steering Group

DATE: June 7, 1978.

1. At its meeting held on May 31, the Trade Steering Group reviewed the implementation of the Medium-Term Work Program on Trade and Commodities. Messrs. Balassa, Frank, Keesing, Laursen, Singh, and Streeten and Mrs. Hughes participated at the meeting. With the departure of two of its members, the group has been reconstituted to include Mr. Frank in the place of Mr. Laursen and Mr. Keesing in the place of Mr. Little.

2. As a general observation, it should be noted that staff constraints have necessitated the curtailment of the work program and have led to delays in the completion of several studies. The enclosure contains the original and the revised completion dates for RPO as well as non-RPO studies. Comments on several subject areas follow.

Research Projects (RPO-s)

3. The Baldwin and Waelbroeck research projects (1.9 and 1.10) on LDC penetration in developed country markets for manufactured goods in the United States and Western Europe have been approved by the Research Committee. In view of decision taken by the Committee, a steering group has been set-up to monitor and review the implementation of the two projects. The steering group will be chaired by Bela Balassa; Mrs. Hughes and Messrs. Kavalsky and Keesing have been asked to participate in the group. The same steering group will function in regard to comparable studies for other countries that are being contemplated. They include studies on Canada and Japan and, possibly, Australia. It has been suggested that the Japanese study should include an investigation of the existence of restrictions as seen from Korea and Taiwan, Japan's two principal developing country suppliers of manufactured goods.

4. The Research Committee has also approved the Keesing project on "Key Institutions and the Expansion of Manufactured Exports" (1.8). The steering group for this project will be chaired by Isaiah Frank; Messrs. Pfeffermann and de Vries have been asked to participate in the group. In the discussion, concern was expressed regarding the practical implementation of this project, given Keesing's participation in World Development Report II and Kemal Dervis' withdrawal from the project. Keesing was asked to prepare a short report, indicating the implications of these changes for the research project.

5. The Research Committee also approved the Waelbroeck research project on global modelling that would include an investigation of the impact of developing country growth in the national economies of the developed countries (1.11). The steering group for the project will be chaired by Hollis Chenery, with Helen Hughes serving as his deputy. The group's members include Messrs. Balassa, Hasan, Holsen and Pyatt.

6. Several research projects listed in the enclosure have been, or will be, completed according to schedule (1.4, 1.5, and 1.6) while others have

experienced delays (1.1, 1.2, 1.3 and 1.7). A new research project, proposed by Messrs. Dervis and Robinson to examine the effects of trade policy in a model framework, has been accepted by the Research Committee, subject to some modifications. The Policy Planning and Program Review Department plans to submit a research project on shipping.

Non RPO Studies

7. The studies on the processing of primary commodities (2.1) and on energy policies (2.3) are proceeding with some delays due to staff constraints. For the same reason, the study on the sensitivity of LDC exports to business cycles has been cancelled. An issues paper was prepared on intra-LDC trade (2.4) and consideration will be given to further work in the area. Proposals will also be made on future work on the prospects for the smallest and the poorest developing countries (2.2).

8. Studies on developing country exports of electronics and electrical machinery (2.5), nonelectrical machinery (2.7) have been completed in draft form for distribution to interested parties at the Bank. The draft study on textiles and clothing exports (2.6) will be completed in the course of the summer. Due to Keesing's participation in WDR II work, it is expected that these studies will remain in draft form. It has been suggested, however, that they be updated on a continuous basis and the results be utilized in WDR II.

9. A new International Trade and Capital Flows Division will be established in the Economic Analysis and Projections Department by combining much of the work of two present divisions. The work program of the new division will be established in the Fall and the relevant components will at that time be reviewed by the Trade Steering Group.

Liaison with Industry and Trade Research Steering Group

10. A Bank-wide Industrial Development and Trade Steering Group has been established under the chairmanship of Mr. Gordon to define overall priorities for the Bank's research in the area and to examine operational application of research. The Trade Steering Group will continue to function within the DPS; Bela Balassa will ensure the liaison between the two groups.

Cleared with and cc: Messrs. I. Frank, Keesing, Singh and Streeten,
Mrs. Hughes.

cc: Messrs. Chenery, Karaosmanoglu, Haq, B. B. King, Laursen
Members of Industrial Development and Trade Steering Group (with Medium-
Term Research Program)
Messrs. de Vries, Kavalsky, and Pfeffermann

Enclosures
BBalassa:nc

Listing of Bank Studies and Papers
in the Trade and Commodities Area

	<u>Title</u>	<u>Responsibility</u>	<u>Completion Date</u>	
			<u>Original</u>	<u>Revised</u>
1.	<u>Research Projects (RPO-s)</u>			
1.1	670-01 Development Strategies in Semi-industrial Countries (Argentina, Colombia, Israel, Korea, Singapore, Taiwan)	DRC, Balassa and consultants	Jan. 1978	June 1978
1.2	670-87 Industrial Policies and Economic Integration in Western Africa	DRC and DED, Balassa, Pursell, Shepherd and consultants	June 1978	Dec. 1978
1.3	671-05 Patterns of Industrial Development	EPD, Prakash	June 1978	Oct. 1978
1.4	671-09 Natural Resources and Planning: Issues in Trade and Investment	DRC and DED, Blitzler, Stoutjesdijk and consultants	June 1978	June 1978
1.5	671-10 Promotion of Non-traditional Exports	LAC, Greene and consultants	March 1978	Completed
1.6	671-35 Export Incentives in Developing Countries	DRC and DED, Balassa Papageorgiou, Pursell and consultants	June 1979	June 1979
1.7	671-56 Marketing Manufactured Exports	DED, Morawetz (cons)	Dec. 1978	June 1979
1.8	671-68 Key Institutions and Expansion of Manufactured Exports	DED, Keesing,	June 1979	June 1980
1.9	671-67 Effects of Increased Imports of Manufactured Goods from Developing Countries in the United States	EPD, Baldwin, consultants	Dec. 1979	Dec. 1979
1.10	Effects of Increased Imports of Manufactured Goods from Developing Countries in Western Europe (old title Manufactured Exports Module).	EPD, Waelbroeck, consultants	to be determined	June 1980
1.11	671-66 Impact of Developing Country Growth on Economies of Developed Countries	EPD, Waelbroeck, consultants	to be determined	June 1990
1.12	Sources of Growth and Productivity Change	DED, Robinson, Dervis	-	Dec. 1980

<u>Title</u>	<u>Responsibility</u>	<u>Completion Date</u>	
		<u>Original</u>	<u>Revised</u>
2. <u>Non-RFO Studies</u>			
2.1 Processing of Primary Commodities	EPD, Takeuchi and Chung	Oct. 1978	June 1979
2.2 Export Performance and Diversification Prospects for the Smallest and the Poorest Developing Countries	EPD, Singh	June 1979	to be determined
2.3 Energy Policies in Developing Countries	CPS, EPD, Hoffman Friedmann	Oct. 1978	Dec. 1978
2.4 Intra-LDC Trade	EPD, DED, Laursen, Keasing	June 1978	to be determined
2.5 Developing Country Exports of Electronics and Electrical Machinery	DED, Plesch	Nov. 1977	Feb. 1978 (draft)
2.6 Developing Country Exports of Textiles and Clothing	DED, Keasing	Dec. 1977	Aug. 1978 (draft)
2.7 Developing Country Exports of Nonelectrical Machinery	DED, Kawaguchi	Jan. 1978	May 1978 (draft)
2.8 Sensitivity of LDC Exports to Business Conditions in Developed Countries	EPD, Schwartz and Grilli	May 1978	Cancelled

Areas for Research on Industrial Development

1. This memorandum is intended to help focus discussions on areas that merit attention in further research on industrial development by the Bank. The External Panel on Research in Industry and Trade may find it useful as an indicator of some of the topics that are being considered by the Industry and Trade Research Steering Group that has recently been established to review research programs in these two related fields. The Steering Group proposes, following initial discussions with the External Panel, to prepare a more detailed outline of a near-term future research program in these fields.
2. This memorandum should be read in conjunction with review of the status of on-going programs, with which the future programs may have strong linkages. Also suggested herein are some additional topics or lines of investigation that are becoming more important in the Bank's work and that have not been adequately covered.
3. The focus is on topics in industry. Consequently, this memorandum may be regarded as a companion piece -- with a different orientation and coverage -- to the memorandum entitled "Medium Term Work Program in Trade and Commodities."
4. In order to avoid a long, indigestible list of individual topics, among which it may be difficult to reach any consensus on priorities, a smaller number of topical "families" are identified below. Each family may include a number of individual topics that are closely related, and it is not necessary at this stage to attempt exhaustive identification of specific topics. The order of presentation of the topical families does not imply anything about priorities.
5. A point of general concern affecting all the topics listed below is the question of the basic orientation of the Bank's research in industry. The four main objectives stated in the terms of reference of the External Panel include, inter alia, "to support all aspects of Bank operations . . ." and "to broaden our understanding of the development process." In order to meet these objectives the research program will necessarily involve a mix of work on innovative methodologies as well as work of immediate relevance to specific operational problems. The time required to develop new methodological approaches and to perceive operational "payoff" may be lengthy. Ultimately, however, all such work must be related and of value to the stated objectives of the research program, and in areas where the Bank has a comparative advantage over academia. This relationship needs to be continuously reviewed, its definition refined, in order to avoid a widening gap between researchers and their work on the one hand and the practitioners in the Bank's project and industrial policy work on the other, and worsening of the already *serious* dissemination problem. At the same time, due attention must be given to meeting the research needs that emerge from the practitioners' day-to-day work and problem solving attempts. The staffing and organization of research should be such as to enable research staff to work closely with the operational and sector departments and have a participatory role in the Bank's industrial operations and policy dialogue.

The formation and composition of the Steering Group was intended to reflect this necessity, and to take account of the range of questions and options it poses in considering research priorities; the External Panel is urged to do likewise.

A. Industrial investment strategy and policies in selected country situations.

6. The variety of country situations calls for different designs of industrial growth paths and policies to support them. The following categories are illustrative of differentiations that can be made; in-depth case studies could be undertaken to illuminate familial differences and to provide operational guidance.

- (a) Countries rich in material resources (e.g., Venezuela, Iran, Indonesia). Resource based industries may be used as the springboard for development but must be linked to other downstream and supporting activities, and to expansion of exports.
- (b) Non-industrial economies (e.g., Burma, Cameroon, Paraguay), which are just beginning the process of industrial development; attention must be given to the relative importance of policy tools, incentives, management and labor training, the role of private foreign investment, and the sequence of import substitution and export development. Research project could take off from work done on basic mission to Tanzania and current sector work in Cameroon.
- (c) Sub-Saharan Africa. While similar in some respects to countries in category (b) above, this group of countries may deserve separate treatment for various reasons. High wage levels may inhibit development of labor-intensive export industries. Dominance of private foreign investment in Africa may have a great deal to do with the dualism of these economies, use of inappropriate technologies and the stunting of small scale enterprise. A comparative study on wage rates and labor productivity would throw more light on this problem, and on reasons for their divergence; this needs further exploratory work and preparation of a research design. A review of the literature on (i) the impact of private foreign investment on African economies, and (ii) the relevant policy frameworks of African governments should be undertaken initially; a great deal has been written but there is little evidence, in sector policy or operational decisions, of its absorption by Bank staff. A systematic review would enable us to take stock of what is known, and to define more correctly the subjects requiring further research.

7. Other patterns might be the export-oriented East Asian countries, the import substitution pattern which has characterized South Asia in the past (although now changing to some extent), and the Latin American propensity and adaptation to inflation. All have been studied, more or less intensively -- more than those in para 6 above -- but there is continuing need to relate the findings of these studies to other regions and situations (as in para 6).

B. Employment enhancement through industrial development.

8. This topic clearly is important in the context of the Bank's concern for alleviating urban and rural poverty and its emphasis on creating not just more jobs but more productive (i.e., higher paying) jobs, since solutions are supposed to be efficient and not simply welfare systems. Papers by J. Stern made a beginning on this problem, and highlighted the significance of both direct and indirect effects, and the wide differences in this regard among various industrial subsectors. The second Stern paper also explored the implications of employment effects in countries at various stages of development. Specific research topics that result in improved methods of measuring or enhancing employment through industrial investment, or that bear on the choice of industrial subsector priorities or mix, or that affect the design of projects, etc., would be much to the point.

9. One important sub-family of topics is the employment (and other) aspects of small and medium scale enterprises (SME). Their problems are often thought to be so special as to constitute a separate genus. Are they efficient users of factors? In what industries or activities? How can efficiency be enhanced? What special incentives or technical and technological assistance do they need? What mix of small and large scale industries is effective, and how do they interact, in complementary or competitive ways? More broadly, what is a proper balance between capital-intensive and labor-intensive industries in countries at different stages of development and with different size and population characteristics? What are the implications of large scale, capital intensive patterns of industrial investment for indigenous entrepreneurship, finance, business organization and technology? These are some illustrative issues.

10. There is need for a more systematic analysis of institutions supporting SME development -- for technology, management, marketing, export promotion, product design, etc., as well as various kinds of finance. What could be done almost immediately is a summary of Bank experience in SME support, including criteria for judging institutional effectiveness, analytical descriptions of those support systems which are regarded as particularly strong, and possible means for closer linking of technological assistance with project appraisal in Bank DFC lending with a view to taking greater account in such lending of capital saving devices and processes. The modalities of rural industrialization may require separate analysis: the nature of industries suitable for rural resource endowments and markets, linkages with agriculture, infrastructure requirements, policies and institutional framework, etc. The case study approach that has often been used (e.g., 671-59) may have to be supplemented by other approaches to this problem.

C. Developing the technological base.

11. Many countries, particularly those classified as semi-industrial, are increasingly interested in developing their own technological capabilities, reducing dependence on licenses and enhancing their adaptive capacity. Technological assistance to small industry, to be effective, may have to be linked to R&D activity of a simpler character, especially in smaller or poorer countries. Some specific projects are in process of discussion and design, and a few have been approved and are being implemented. Moreover, in industrial sector work more attention is being given to this topic. For example, work on the engineering industries is being stressed because they may have many desirable characteristics (e.g., they tend to be efficient at small scale; they tend to be labor-intensive; the demand is highly income elastic; they have strong backward and forward linkages; there are definite export possibilities; and they are an important "carrier" for technological change). These characteristics need to be more fully demonstrated and conditions for successful projects established through research in depth on the policies, institutions, and methodologies for strengthening indigenous capabilities in countries at different stages of development.

12. Possibilities of labor-capital substitution are under study in the mechanical engineering industry, with special reference to African conditions (Phase II of R671-51). Depending on the outcome of these projects, further studies of possibilities of improved project design in selected industries may be indicated.

13. It is recognized that research on technology will require close collaboration between engineers and economists, will have to be product and industry specific, and possibly be conducted in a sequential manner. Hence, we cannot expect to mount a large number of projects in this area. Our main object would be to influence the processes of project preparation and industrial planning by paying more explicit attention to the technical feasibility of capital-saving devices and processes.

D. Financial systems and industrial development.

14. There is considerable interaction between the availability of finance and the pattern and direction of industrialization. Several topics involve issues that affect Bank operations and hence may deserve attention. The Bank has a long history of lending to financial intermediaries. A fresh look is needed at the relationship between the growth of these entities (and also capital market and venture capital institutions) and industrial growth requirements. What kinds of specialization are called for? What strains and problems arise at various stages of expansion and diversification? What are instruments and conditions for success? What alternative sources of finance (foreign and domestic) are available? What incentives and policies will stimulate the right kind of financial sector development? How should future Bank programs aim to foster such development?

E. Programming models in industry.

15. This work got off slowly and has had success in the Egypt fertilizer model, the S.E. Asia and India models; it is in danger of being terminated for lack of wide recognition of its potential practical application. There is a whole "cascade" of modelling work that needs to be pursued: investment planning in a sector for a country; allocation of output within firms in the industry (the locational aspects are important); planning output within the firm; linking sector models to obtain an economy-wide model; inter-country locational models for investment and output planning. A continuing effort is needed to avoid losing momentum. (See 670-24.)

F. Structure and patterns of industrial growth among countries.

16. This topical area has received a great deal of attention in the Bank, most notably in project 671-05. Another "round" of activities recently approved, involving special case studies on Turkey and Korea, will use a newer and modified data system and will pursue prior country results to investigate comparisons in several dimensions. Questions of a similar kind also arise in the context of Bank operational work.

17. Decisions to support specific projects by the Bank are made primarily on the basis of calculations internal to the project and the country (e.g., economic and financial rates of return). But increasingly there is awareness that in counseling several countries to pursue (or not) projects in textiles, pulp and paper, fertilizers, shoes, steel, etc., a global (or at least a regional) framework and consideration of dynamic changes are really required. Also the locational aspects of new investment have been brought up, specifically by the UNIDO Lima targets; the FAO has been conducting studies of the phased development of world pulp and paper resources, and the subject is receiving increasing attention in various other contexts. In order to have a solid basis for recommendations on industrial strategy, the Bank should undertake research on the relative development and locations of investment in selected intermediate goods (as indeed it does now on a limited basis); but, more importantly, the research should investigate questions such as: What are the gains and losses in trade and market control? Will the locational shifts lead to greater or lesser efficiency? What are the implications for investment criteria and finance? What are appropriate Bank responses and approaches in supporting specific projects in these products?

G. Export potential and promotion of industrial goods.

18. This topical area provides the best example of overlapping interests in industry and trade. Extensive work has been done in the past, notably on trade incentive systems, and further work is outlined in the memo on the work program for trade and commodities mentioned previously. This research has now reached a stage where it can be applied to particular country situations, as a basis for assessing or devising specific operational policies/programs for export promotion. The scope

of the work will have to be tailored accordingly. We have the West African studies (DRC) at one end, and the Turkey and Portugal examples at the other. Several other countries will require fresh attention. We should also assess DFC lending as a tool of export development, with a view to making it more effective.

H. Policies and programs affecting public sector enterprises.

19. Increasingly Bank sector missions undertake to review the performance of public enterprises and suggest policy and institutional changes to improve their efficiency. Public enterprises cannot be judged on the same basis as private firms, and we need to develop an analytical framework adequately to tackle this problem. Our capability to provide policy advice in such areas as pricing and product mix, incentive and control mechanisms, financial policies and socio-economic environments needs to be strengthened. Another key area is the institutional framework for managing and controlling public sector enterprises -- what forms are appropriate under different political and administrative contexts, e.g., holding companies as in many Western European countries or a Public Enterprise bureau as in India.

J. Investment appraisal methodology.

20. The acquisition and processing of data for shadow pricing and effective protection or domestic resource cost calculations can be time consuming and costly. Exploration of short-cuts and "second best" methods to determine how close they come to full-system results, how sensitive they are, how much time they actually save, etc., would potentially be of significant benefit to the project analyst.

K. Studies undertaken in context of DFC and industry lending.

21. There are relatively few such studies (certainly less than, for example, in Education or Rural Development) but in a number of cases, in different countries, they clearly relate to our operational concerns, e.g., textile sub-sector, characteristics of small industry sub-borrowers, trade incentives and functioning of financial markets. There is need for a more systematic review of what exists and of the potential for focussing the attention of borrowers on key issues in their country context. More Bank staff support in starting the studies, and in reviewing their implications and usefulness, would doubtless be required to do this effectively, and this may be a bottleneck; but effective use of these external resources should certainly be economic in the longer run.

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Industrial Investment Analysis: An Overview of Research and Applications*

RPO's 670-23 and 670-24

Alexander Meeraus (DRC), Yung Rhee (DED), Ardy Stoutjesdijk (DED)
and Larry Westphal (DED)

1. Introduction

There is growing recognition among development planners that detailed sectoral planning models based on programming methods are potentially powerful aids in the identification and appraisal of sound development projects. This is true in particular for the industrial sector, where both the frequent occurrence of economies of scale in production and of interdependencies among individual production activities render the simultaneous analysis of sets of investment projects imperative.

In this paper, we describe in a fairly condensed form the scope and objectives of a long-term research program at the World Bank in the area of industrial investment planning. Attention will be paid to the results achieved during the research phase as well as to the experience gained during a variety of attempts to apply the planning tools under operational conditions. Moreover, an initial assessment will be made of the effectiveness of alternative dissemination strategies for research output of this nature. As all authors have been involved in the research program as researchers, an overall assessment of the research effort will

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have to await the reactions of practicing sector planners and project analysts.

2. Scope and objectives of the research program

A large number of alternative project combinations often needs to be considered when drawing up an investment plan for a given sector or sub-sector. Here a project is defined as an investment scheme that is strictly specified in terms of location, scale, timing, product mix and production technology. A cement plant in location A is one project, exactly the same plant in location B is another. Similarly, a steel plant of given specification to be constructed in year t is a project, while the same plant to be constructed in year $t + 1$ is another project. Defined in this manner, it should be clear that investments in an industrial sub-sector such as the steel industry, the forest industry or the fertilizer industry can follow any one of a very large number of possible project combinations, particularly if timing and scale are specified as part of the planning problem. Even so, the investment planning problem in those sectors is relatively straightforward if compared to sectors such as textiles, mechanical engineering, or electrical equipment, where a much greater variety of products and processes exists, and moreover, capacity sharing frequently occurs.

The sector planner in a less developed country is frequently faced with the task of proposing specific projects, to be considered for further detailed engineering, appraisal, and eventually, implementation. To compound the difficulties, the formulation of such projects must often take place in an environment where no previous experience with similar investment activities exists. In the absence of good planning procedures for this task, it is perhaps not surprising that in practice one can observe heavy reliance on rules of thumbs, and a multitude of abandoned projects somewhere along the project analysis road.

Against this background, the World Bank launched a gradually expanded research effort in the area of industrial investment planning, the objective of which was clear: can one design planning tools that can be of assistance in the systematic screening of the various project combinations that are normally feasible within a given sector or sub-sector, and reduce the choice set to a manageable few, given a choice criterion or set of threshold values?

The research team was able to build upon a substantial body of relevant literature in the area of quantitative economic planning. The development of quantitative methods to incorporate economies of scale was begun by Hollis Chenery, first by a study of the effects of economies of scale on the optimal timing of capacity construction for natural gas transmission [3], followed by a study which focused on the need for simultaneous analysis of interdependent projects that are subject to economies of scale [4]. Alan Manne [13] extended the methodology developed for the natural gas transmission problem to include probabilistic demand growth, and the choice between domestic production and imports. Thomas Vietorisz and Alan Manne [24] considered the effects of economies of scale on the spatial location of projects and analyzed the optimal location of capacity in the South American fertilizer industry, applying a methodology developed by Markowitz and Manne [15] based on the use of mathematical programming techniques in project planning under economies of scale. Manne et. al. [14] proceeded to study the optimal time-phasing, scaling and location of several industrial activities in India; at about the same time, David Kendrick [11] developed a multi-product, multi-period model of the

Brazilian steel industry. Larry Westphal [25] subsequently developed a multi-sector model of the Korean economy in which special attention was paid to investments under economies of scale in the steel and petroleum sectors. Following his earlier contributions to the Manne et. al. volume [7], Erlenkotter produced a number of papers on the optimal sequencing of large scale expansion projects.

The above-mentioned contributions have a number of characteristics in common. They represent first of all methodological contributions, designed to advance the state of the art in the development planning literature, and addressed primarily to fellow researchers. Secondly, and not unrelated to the first point, the specification of the planning problem was kept as limited as possible, while still capturing the main conceptual issues, so as to minimize the computational burden. Even so, most of the early attempts to obtain numerical solutions to the planning models - particularly those formulated as mixed integer linear programming models - proved extremely expensive. For example, the Vietorisz/Manne study of South American fertilizer [24] required reportedly 40 hours of computer time, using a special purpose code.

Since these early studies were made, tremendous progress has been made in computer technology. A number of good, albeit general purpose, mixed-integer programming codes became commercially available; moreover, computers became increasingly faster and capable of handling larger problems. It appeared therefore quite attractive for an institution such as the World Bank to further investigate the potential usefulness of this type of planning model for sector and project analysis.

We shall now turn to a brief description of progress made to-date. In doing so, we shall make a distinction between process industries and non-process industries. The distinction between these two types of industry is not always very sharp, and often a matter of degree. However, generally speaking, the process industries are characterized by technological relationships that are relatively straightforward to specify. Products are predominantly homogenous, with no or minor quality differences within a class of products, and few in number. Productive equipment is mostly single-purpose; e.g. a phosphoric acid plant is used to produce phosphoric acid, nothing else. In turn, the latter product can be unequivocally described in terms of its chemical composition. In contrast, the non-process industries are much more difficult to model. The number of products is extremely large, while productive equipment may be used in the transformation of a variety of different products. Imagine the type of products in the mechanical engineering industries that require a lathe somewhere along the line. Given these differences, it will not be surprising that our research effort with respect to the planning of investments in the process industries is much closer to operational implementation than that in the non-process industries which has only recently reached the stage of initial testing in the field.

3. Planning in the process industries.

The research program started off with a detailed investment planning study of the East African fertilizer industry. A mixed integer programming model was formulated of a dimension that had not been attempted

until then, and consisted of over 3000 constraints, 160 of which were zero-one constraints. This size was the result of the explicit goal to specify a model that was meaningful for operational planning purposes, and that could be expected to result in the identification of an investment program that could subsequently be subjected to careful economic appraisal.

In its original formulation, the model could not be solved at reasonable cost, and no globally optimal solution to the model was obtained. We proceeded in several directions. First, we designed a large number of procedures that could be used to facilitate computerized solution of the model. These are described in some detail in a forthcoming monograph, edited by Stoutjesdijk and Westphal. [20] They are partly based on economic concepts, but to a large extent are computational shortcuts that make use of the special structure of this type of planning model. Many of these may be useful if adequate computer facilities are not available.

The results of the East African fertilizer study turned out to be of great help in obtaining a more comprehensive insight into the sectoral investment planning problem at hand. In particular, the ability to assess with extreme rapidity the impact of parameter changes on the investment strategy was generally regarded as a notable advance over more traditional techniques of sector planning and project analysis. Encouraged by this initial reception of the research results, we proceeded in the following manner. First of all, the fertilizer planning model was repeatedly applied and adapted in various circumstances. The most detailed and comprehensive

application was done for Egypt, where in fact a series of planning models was formulated, jointly with Egyptian counterpart planners. The first model was designed to reproduce the current situation in the Egyptian fertilizer sector, both to demonstrate to a skeptical audience that the model could indeed capture the salient characteristics of the sector, and to use the model framework to generate sets of base-year data that could not be collected in the field, but that were in fact implied by available data on related matters, e.g., detailed domestic transport flows. Next, a detailed planning model was formulated for the medium term, focusing on conventional issues such as production, product mix, and domestic trade in fertilizer products, raw materials and intermediates, as well as production capacity expansion possibilities. In turn, a less detailed model was formulated to investigate longer-term strategic issues, such as alternative export strategies and their implications. The study was written up and published in the World Bank Staff Working Paper Series [6]. A different version of the study with more emphasis on the approach than on the numerical results, is incorporated in [5].

In addition to such further national planning studies, the planning approach has received favorable attention due to its potential as an analytical device to study the scope for project-oriented co-operation among several adjacent developing countries that, because of their limited domestic markets, can not fully capture economies of scale. Once more, the fertilizer model was used as a demonstration case. The model was first adapted to study the prospects for such co-operation in ASEAN, the Association of South East Asian Nations, encompassing Indonesia, Philippines, Malaysia, Thailand and Singapore.

A number of alternative investment scenarios was designed (incorporating a variety of strongly expressed preferences for specific allocations of projects in the region) and assessed in terms of its attractiveness to the region as a whole, and to each of the countries individually. The study has contributed to the growing acceptance of a regional investment strategy for particular industries in ASEAN, and detailed proposals for implementation are being considered. [6a]

In collaboration with the Inter-American Development Bank, and the Secretariat of the Andean Common Market in Lima, Peru, Bank staff from DPS and Industrial Projects Department undertook a detailed study of the scope for coordination of investments, production and trade in fertilizer products in the Andean Common Market. The study involved sector specialists from all five countries (Peru, Colombia, Bolivia, Ecuador and Venezuela), workshops in Lima, and was carried out by staff and consultants to the Secretariat, under the supervision of World Bank Staff. The novelty of this application of the planning methodology is that it will provide, for the first time, an opportunity to test the hypothesis that political negotiations regarding an industrial sector agreement among different countries are facilitated by a planning method that permits rapid quantification of the implications of alternative investment scenarios. In this case, negotiations are scheduled to begin in August, 1978, on the basis of five alternative formulations of^a coordinated regional fertilizer policy.

Finally, the fertilizer model has been specified as a world-wide model, dividing the world up in 20 major regions, and with the objective of determining the most efficient manner in which the projected shortfall in fertilizer supplies by some future date could be met. The main factors influencing this world-wide production pattern are the location of raw materials, the size and expected growth of demand for fertilizer material in the various regions, differences in investment and production cost among regions, and transportation costs. A study of this nature gives considerable insight into the capital requirements for an industry on a world-wide basis, and potential production and trade patterns. It showed that the developing nations in the world are in a comparatively favorable position to expand their fertilizer production capacity as opposed in the traditional producers. The study is incorporated in a paper that was presented to the Board of Directors of the World Bank [10].

Parallel to the series of applications of the fertilizer model, other process industry models were formulated and applied. Most advanced is the work on forestry and forest industry planning. A general model was formulated, and applied in a number of cases. First testing of the model was

carried out in Turkey, where a number of individual forest industry projects was under consideration, but where interdependencies among them were not explicitly taken into account [2]. Next, the model was applied in Malaysia, primarily to demonstrate its usefulness as an analytical tool to address several priority questions the Malaysian government has with respect to the further development of the sector. It appears that the model is an extremely instructive device to study one vital question: should the Malaysian government encourage a centralized, large scale, capital intensive development strategy for the forest industry sector, or should it provide the necessary incentives to induce a decentralized, more labor-intensive strategy. This particular set of strategies can be modelled fairly easily, if data are available, and numerical implementation provides a wealth of insight on the basis of which intelligent decision-making is feasible.

The forest industry model has been transferred for use by FAO in the framework of its World Pulp and Paper Industry Program; with the help of a former Bank staff member, the model has been implemented on the computer facilities of the University of Bologna, and applied to the ASEAN region [8]. It is intended to be used for a number of other regional planning studies, to be undertaken by FAO.

Work on a planning study of the Mexican steel sector has just begun. Here, the basic approach will be used to address a number of specific problems currently of major concern to individuals and organizations involved in the steel sector. Among these are the choice among several technological alternatives for steel making depending on energy type; specialization among existing plants; and, expansion possibilities of the sector over the medium term. The study will, once more, be conducted with the full collaboration of counterparts in Mexico, and will involve a Mexican graduate student of the University of Texas.

Finally, in September, work will start on the chemical sector in Turkey, at the request of, and in collaboration with, the Industrial Development Bank of Turkey; in this case, Bank staff's role will be limited to technical advice.

4. Planning in the non-process industries

The research program's first task in respect to the non-process industries was to test the feasibility of applying process analysis type, mixed integer programming models to investment analysis and further to determine whether operationally useful results could be obtained. It was decided to concentrate on the mechanical engineering sector, since this sector is increasingly more important as especially the larger, more advanced developing countries substitute for durable goods imports. Also, all of the modeling problems one might expect to encounter in the non-process industries are present in this sector. The relevant antecedents to our effort were empirical studies of the metal working sectors in the U.S. by Markowitz and Row [16] and in the Soviet Union by a team at the University of North Carolina [9]. The approaches taken in these studies are rather diametrically opposed, the first being a greatly disaggregated, process analysis study, while the second is a far more highly aggregated study that is closer in spirit to input-output analysis. Neither of these studies was explicitly concerned with investment analysis; but, building on the latter, Vietorisz in a monograph for UNIDO later proposed a model structure using a mixed integer programming formulation for investment planning in mechanical engineering [12].

Two key features characterize Vietorisz's model structure. The first is aggregation of equipment and associated labor (eg. a lathe and its operator) into "shops", a "shop" being a collection of complementary equipment that can perform closely related processes (eg. a machine shop). Detailed production control and scheduling is typically carried out at the shop level, so that shops are indeed the building blocks which make up the individual plants within the sector. And, as there is far less diversity among shops within a given shop class than among plants within the sector, aggregation to this level simplifies the structure of a sector-wide model as well as the estimation of its technical coefficients. The second feature is the use of "representative products" to aggregate over heterogeneous products. This is simply an adoption of the tradition among mechanical engineers of using a single, uniquely specified product to serve as the "representative" of a class of products. Representative products are intended to be "representative" of the intermediate input and processing requirements of the individual products falling within their respective classes, and not necessarily of product characteristics as viewed from the buying side. The degree to which they are truly representative is of course dependent upon how narrowly the boundaries between product classes are drawn.

Vietorisz initiated the Bank's empirical research with a study of several heavy electrical equipment producers in Mexico to test the application of these concepts at the plant level. While it was found that input-output parameter estimation was greatly simplified by plant management's use of closely similar concepts in their own production control, it did not

prove possible to conduct a full test of the concepts by comparing calculated input requirements against actual usage, though a partial test was made

[23]. In the course of his investigation, Vietorisz became persuaded that dynamic phenomena, particularly learning-by-doing and the progression through levels of technological "sophistication", are far more important to investment planning than are the underlying phenomena captured in a programming model, so much so that he has done no further work on programming models for the non-process industries.

Westphal and Rhee took a somewhat different tack in testing a refinement of Vietorisz's model structure. In collaboration with a team of engineers, a model of the entire Korean mechanical engineering sector

was constructed with the aim that it would serve as a screening device to obtain an initial ranking of production activities within the sector prior to the design of specific projects. Because of the complexity of the sector and the experimental nature of the model's implementation, it omitted a number of features now standard in programming models for investment planning in the process industries. It was restricted to the "make-buy" choice between domestic production and imports, was static, and did not incorporate locational details. However, economies of scale in the cost of shop capacity were specified. The objective function was to minimize the cost of satisfying a fixed bill of "external" demands for various mechanical engineering products. The supply (production plus imports) of each product was constrained to meet the fixed "external" demand plus the intermediate demand that was due to production activity within the sector. The focal concern of the model was the interdependence among production activities within the sector; this constituted its potential advantage over the traditional methods of investment analysis used in the sector.

The number of representative products included in the Korean model was 120, with items ranging from components (eg. nuts and bolts) through sub-assemblies (eg. motors) to end products (eg. refrigerators). Given that the model contained more than 300 shop classes, the number of integer variables was over 300 and each of these could assume any non-negative integer value (though an upper bound for each was calculated from given levels of external demand). Furthermore, due to extensive capacity sharing among production activities and the use of common components and sub-assemblies, the model was indecomposable except for six out of the 120 production acti-

vities. Given the size of the model, straightforward application of an available solution code was considered too expensive to attempt, while its complexity precluded obtaining a proven, globally optimal solution through any other means. Instead, a method based on economic principles was devised to determine which production activities were critically interdependent with others.

An activity is said to be "critically interdependent" if its presence in the globally optimal solution depends upon the set of other activities also present in this solution. In turn, an activity that is not critically interdependent will either be present or absent in the globally optimal solution, and this can be determined without computing the levels of the various activities in the globally optimal solution or applying a standard solution code. Furthermore, bounds can be computed on the loss due to taking the wrong decision with respect to a critically interdependent activity. For a given specification of the parameters, it required less than one minute of CPU time to determine the critically interdependent production activities and calculate a variety of subsidiary information including marginal and average production costs and, breakeven production points.

Given the high degree of interdependence among production activities in the Korean model, as "measured" by the extent of capacity sharing and use of common inputs, it was surprising to find that the number of critically interdependent activities never exceeded ten and generally fell between three and six. Thus the optimal "make-buy" choice could unambiguously be determined for over 110 out of 120 production activities, though the globally optimal levels of production for those items that should be produced domestically could not be ascertained. Given the imprecision of parameter estimates

due to aggregation errors that must result in sector-wide planning models for the non-process industries, it is probably too much to expect such models to determine precise production levels. It is enough that the set of products be divided into three sub-sets: make, buy, and indeterminate.

The approach used in the Korean experiment has not yet been published in an accessible form, so that a widely based judgment regarding its operational usefulness can not be reported [27]. Among those both within and outside the Bank who have an understanding of the approach, two reactions are typical. Those involved with investment planning at a general level that is not project specific generally find it attractive. On the other hand, those responsible for lending to projects find its results insufficiently specific. Thus, it was intended to apply the model in Mexico where both the Bank and the government are seeking to identify production lines in which Mexico would have a comparative advantage within mechanical engineering. However, discussions have led to a revision and a tentative agreement has been reached to use process analysis and the mathematics of mixed integer programming to evaluate alternative designs for a complex of projects that would produce equipment for plants in the process industries. It is anticipated that the results at this level would be highly project specific whereas the Korean model was more general in its scope and identified only possible lines of production and the types of processing facilities that would be required. A project document on this application is now available [22].

The impending application in Mexico will benefit as well from another empirical investigation that has been made of the mechanical engineering sector. After obtaining initial results from the Korean experiment described above, we were pressed to incorporate choice of technique into our work, in part to extend the methodology of investment analysis but even more importantly

to appraise the scope for capital-labor substitution within the sector. Given the latter objective it was decided to adopt a far more disaggregated approach in the investigation of choice of technique. This study is thus closer to the work of Markowitz and Rowe; in fact, it is even more extreme in its detail and specificity.

Four specific products were chosen for the investigation. The approach used begins with a parts breakdown to identify the components making up the final assembly. Next, the possible process sequences to produce each component and carry out each assembly stage are determined, and for each process sequence the individual process stages or tasks are delineated along with the particular pieces of equipment that may be employed to perform the required tasks. Using this method, an extremely detailed set of data has been collected giving machine and labor times required for the various tasks, distinguishing among specific machines and grades of labor and between set-up, operating, and handling time. We are now processing the data to obtain analytically meaningful production relationships. (The study is described in [19].)

The level of detail employed in the choice of technique study is close to that found in investment planning models of the process industries. Nonetheless, at least for the foreseeable future, modeling at this level of detail in the non-process industries is of clearly limited direct use to investment analysis; it is simply too expensive in time and resources [25].

However, this study is providing a useful and necessary perspective on modeling technological choices at higher levels of aggregation that yet remain project specific. It is quite unlikely that we would have the confidence to attempt the Mexican application without this prior experience.

Aside from what has been learned about methodology, one important lesson has been gained from our work to date. Principally due to the complexity and heterogeneity of products and processes within the sector, the formulation and empirical implementation of investment planning models for mechanical engineering activities is far less a matter of following set recipes that appears to be possible in the process industries. While we now expect rather quickly to arrive at an approach to project specific planning that can be written down as the approach to sector wide planning has been, it will take considerable skill on the part of knowledgeable sector specialists to apply it. This is largely because pre-selection of alternatives to be investigated plays a larger role in planning investments in the non-process industries due to the uncountable infinity of possibilities. Furthermore, it is evident that engineers and sector specialists must be involved from the start in any application and that the ratio of engineers to economists in the application will greatly favor the former over what has so far been found necessary in applications to the process industries. In turn, because of the importance of pre-selection, more of the important knowledge gained will come during the model's articulation. Indeed, it appears that one of the principal advantages of the programming approach is the discipline and order imposed on the organization of information collection, assembly, and analysis before the stage of model solution. Our experience to date in Mexico suggests that analysts following more conventional approaches are unable to communicate to policy makers the information they assemble with as much clarity and operational relevance as is possible simply following a programming approach without actually solving or even numerically analyzing the model that is estimated.

5. Dissemination

Efforts to disseminate the World Bank research effort in the area of industrial investment planning take several forms. First of all, several monographs are in preparation that are addressed primarily to the professional audience of mathematical economists and development planning specialists. Most advanced is a volume, edited by two of the present authors (Stoutjesdijk and Westphal), on industrial investment analysis in the presence of increasing returns. In addition to a thorough treatment of the planning methodology the monograph contains several original case-studies based on the methods discussed. Another monograph focusing on the use of process analysis models to analyze the scope for capital-labor substitution in the non-process industries is also in preparation.

Another series of publications is being prepared, under the editorship of Alexander Meeraus and Ardy Stoutjesdijk. These are best characterized as "manuals", since they provide detailed and comprehensive guidelines on the use of mixed-integer linear programming models in a process analysis format in the formulation of sectoral investment programs. The first volumes in the series are about to be published. The first volume contains a detailed introduction to the planning methodology, describes the advantages of its use, the difficulties associated with practical implementation, as well as the major limitations of the approach [12]. The second volume focuses on the use of the methodology for planning investments in the fertilizer industry [5]. A fairly detailed technical description of the products and processes relevant to fertilizer production, a series of planning models is developed, of slowly increasing complexity, that can be used to address selected sets of decision

problems that may have to be addressed by the fertilizer sector analyst.

The volume also contains a practical case study, carried out under operational conditions in terms of time and resources. Both volumes are expected to be published toward the end of this year.

Other volumes are in preparation. Volume 3 deals with the forestry and forest industry sector; the remaining task is the final editing of the case study [3]. Volume 4 is concerned with planning investments in a multi-country framework [18]. The general methodological part of this volume still needs considerable work; however, the Andean Common Market application described earlier will serve as a case study for this volume. Volume 5 [1], on steel, has just been started.

The series will be completed with the preparation of a so-called Users' Guide [17]. This volume will focus on the generation and the solution of the planning models, as well as on efficient report generation procedures. The completion of this volume is dependent on the progress made in a separate research project, under the direction of Alexander Meeraus, which aims at the formulation of a new and easier-to-use representation of algebraic models.

The series of volumes is written with the practical sector planner and project analyst in mind, and generally does not assume any prior familiarity with linear programming techniques. To facilitate the use of the methods proposed, each volume contains at least one case-study, carried out in the context of a regular request for technical assistance in sector planning from a World Bank member country. These case studies are conducted in collaboration with sector specialists from the Bank as well as interested counterparts in the country concerned.

In addition to the case studies for the manuals, the research team has been involved in a variety of applications of the planning methodology with operational Bank staff. To mention a few examples, the planning model of the mechanical engineering industry, originally applied to Korea, is currently being adapted and tested for use in the Mexican context, as mentioned earlier. Similarly, a model of the cement industry was used to carry out a preliminary investigation of a large cement project in a West African country.

To sum up, a fairly lengthy research phase is currently being followed by an increasing number of applications of the methodology in practical situations. There are strong indications that there is a very large potential market for the use of mixed-integer linear programming models in sectoral planning, particularly in the developing countries. It is therefore of some importance to indicate at this stage in a candid manner what kind of difficulties the research team has experienced to-date in attempts to transfer the technical expertise required to implement this type of model to potential users.

6. Transferability

There are three phases to be distinguished in the use of the planning models in an operational setting. First, a model needs to be specified that is tailored to the planning situation at hand, avoiding unnecessary detail while capturing the important aspects of the problem. The manuals referred to above are designed to pass on this particular expertise to the user, and future experience will reveal whether we have been successful in this respect.

The second phase relates to data collection and organization. Two sets of data are usually required. One set refers to data which are purely local in nature (final product demand, local production capacities in the relevant activities, raw materials availability, labor costs, transport costs, etc.). The difficulties associated with the assembly of this data set vary widely by country. The second data set, comprised of information of a more general nature (such as world market prices, investment costs, technological information, export markets, etc.) is usually more difficult to compile. A concerted effort of the various international agencies involved in sector and project analysis to establish an up-to-date and easily accessible data bank of key information could be a great assistance in the dissemination of the planning methodology. It should be noted that several private and public agencies already provide information of this nature on a commercial basis; for instance, the International Fertilizer Development Center (formerly associated with TVA) and British Sulphur Corporation provide an information service of this nature for the fertilizer industry.

The final phase is that which involves interaction with the computer, both in the organization and manipulation of the basic data, the generation of the model, the solution of the model, and the reporting and interpretation of the results. This is the phase where our greatest problems have arisen so far. Few developing countries have access to the large, high-speed computers that are necessary to implement models of this type. As the models' potential strength lies in their repeated use, rather than a single application, this lack of infrastructure is a serious obstacle in the short run. The second major problem in this connection is the lack of skilled manpower. The available software to solve large-scale mixed integer linear programming models is still inadequate to permit "naive" use, and a carefully designed and monitored solution strategy is imperative to achieve results at reasonable costs. This requires the kind of technical know-how and experience that is rarely available in the developing countries at the present time, and frustrates attempts to pass on the planning methods.

In both respects, rapid improvements are being made. Modern computer technology is rapidly invading the developing world, both through large-scale private companies as well as public institutions. Access to adequate computer facilities is thus rapidly improving. In turn, it may be expected that the greater realization of the application possibilities of optimization techniques such as mixed-integer programming will lead to continually more efficient solution procedures, further facilitating the spread of the methodology. Finally, efforts are underway within the World Bank and elsewhere to design computer languages and modelling systems

that would greatly facilitate communication between the computer and the analyst, by substantially eliminating the highly specialized languages that are currently used to convert an algebraically formulated problem into one that is amenable to computerized solution. The general outline of one such approach, the Generalized Algebraic Modelling System (GAMS), recently developed at the World Bank by Alex Meeraus, was presented at the IXth International Symposium on Mathematical Programming in Budapest.

The research output in general, and the abovementioned manuals in particular, aim at alleviating the skilled manpower constraint on wider use of the planning tools. Similarly, case studies, conducted jointly with sector analysts in developing countries are proving to be an efficient vehicle for dissemination. In turn, a growing number of students from developing countries are expressing an interest in using the methodology as the analytical tool for a PhD dissertation, often selecting their own country as the empirical context. In that manner, studies of the Nigerian energy sector, the Mexican steel industry, the world copper industry, and the Brazilian cement industry have already been completed, or are in an advanced stage of preparation.

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