INDUSTRIAL DEVELOPMENT & TRADE
PANEL MEETING NOVEMBER 1978

PANEL
INFORMATION

WORLD BANK / INTERNATIONAL FINANCE CORPORATION

OFFICE MEMORANDUM

TO: Members of Industrial Development and Trade Panel

DATE: November 27, 1978

FROM: Alan Gelb, VPD

SUBJECT: Arrangements for Visit:

The following offices have been reserved for your use during your visit:

Mr. A. Lindbeck, Chairman	- K-3504, Ext. 60028
Mr. J. Donges	- K-3501, Ext. 60012
Mr. C. Bueno	- K-3606, Ext. 60016
Mr. R. Nelson	- K-3604, Ext. 60018
Mr. K Parikh	- K-3702, Ext. 60029
Mr. Kim Jae-Ik	- K-3703, Ext. 60028

All are on the 3rd floor of the Bank's K Building. In addition, the DRC conference room (K-3700) has been booked for all day Thursday and the afternoon of Friday for the Panel's use.

It is suggested that panel members meet in Bela Balassa's office at 9:15 a.m. on Thursday.

Offices and Extensions:

Bela Balassa	- K-3411, Ext. 61998
Suman Bery and Alan Gelb	- F-1233, Ext. 76003/76001
(Secretary, Leela Thampy)	- F-1233, Ext. 76002

AGelb:bf

TENTATIVE SCHEDULE FOR INDUSTRIAL DEVELOPMENT AND TRADE PANEL

Thursday, November 30

9:15 - 10:30 (K-3411)	Meet in Bela Balassa' s office to discuss schedule.
10:30 - 1:00	Reading session (Papers prepared for Industrial Development Trade Steering Group).
1:00 - 3:00	Lunch with Messrs. Westphal, Waide, Wood, Gordon, Balassa and Bery. (Dining Room E Room Three).
3:00 - 5:30 (K-3700)	Discussion of specialized sections of report or Bank's papers.

Friday, December 1

9:15 - 10:30 (K-3504)	Discussion of Lindbeck's section.
10:30 - 1:00 (K-4500)	Meeting with Industrial Development and Trade Steering Group: ~~Fuchs~ Mr. Balassa (Development Policy Staff) Mr. De Vries (Industrial Development and Finance) Mr. Gulhati (Eastern Africa) Mr. Weigel (International Finance Corporation) Mr. Westphal (Development Policy Staff) Waide, Gordon.
1:00 - 2:30	Lunch with Messrs. Bery, Gelb (Dining Room E Room Five).
2:30 - 4:00 (K-3700)	Meeting with Mr. Gordon and Assistant Directors, Regional Projects Departments (responsible for Industrial Development and Trade) Nowel Mr. ~~Bronfman~~ (East Africa) Mr. El Darwish (Europe, Middle East and North Africa) Mr. Glaessner (Latin America and Caribbean) Mr. Dinh (East Asia and Pacific) Mr. Rowat (South Asia) Mr Pouligren (W. Africa)
4:00 - 5:30 (K-3700)	Discussion of comments of Bank Staff, Drafts of Lindbeck's section.

8:00 -	Dinner with Messrs. Balassa, Bery, Gelb (at Chez Camille, 1737 DeSales Street, N.W.)

Saturday, December 2

9:15 - 1:00	Drafting of Report.
1:00 - 2:00	Lunch (at Szechuan East perhaps, could arrange numbers in morning).

Suggested Report Drafting Schedule

December 2	Panel leaves Washington. Detailed specialized chapters almost established. Outline of report prepared.
December 10	Panel members send finalized specialized chapters to Chairman.
January 2	Chairman sends completed Draft Report to Bank for comments. Written comments solicited.
January 15	Comments forwarded to Chairman (or Chairman visits Washington)
January 30	Report prepared.

LINDBECK

A.L.
1978.11.16

Second draft

REPORT BY WORLD BANK PANEL ON INDUSTRIALIZATION AND TRADE

by

Edmar L. Bacha, Gerardo M. Bueno, Juergen B. Donges, Jae-Ik Kim,
Assar Lindbeck (chairman), Richard R. Nelson and Kirit Parikh

December 1978

A.L.

CONTENTS

A.L.

FOREWORD

This is a preliminary draft of the Report by the World Bank Panel on Industrialization and Trade. Though we have a joint responsibility for the report, the division of work within the group has mainly been as follows: Chapter I Lindbeck, Chapter II Donges, Chapter III Bacha, Chapter IV Jae-Ik Kim, Chapter V Bueno, Chapter VI Nelson, and Chapter VII Parikh.

A.L.
1978.11.16

Second draft

World Bank Panel on
Industrialization and Trade

CHAPTER I

GENERAL ISSUES

The general quality of research in the field of industry and trade at the World Bank is, in our view, very high - compared both to university research and to research activities of non-university organizations, including organizations connected with the UN system. Thus, the basic problem of research within the Bank in this field is usually not the quality of research but rather the type of research produced by the Bank and the use of research within the Bank.

When surveying and evaluating the production and use of research on industry and trade within the Bank, we have found it useful to start with some general issues and then to classify the Bank's research in the area under consideration into six main fields. This gives the following disposition of the Report:

(I) General issues.

(II) Incentive policies (for firms) and economic integration.

(III) Patterns of growth of production and trade, including changes in comparative advantages.

(IV) Export promotion policies in the LDCs and access to markets in the DCs.

(V) Institutional conditions and institutional reforms.

(VI) Capital utilization, capital-labor substitution and technological change.

(VII) Investment programming.

It is probably correct to say that the main emphasis of the Bank's research, quantitatively and qualitatively, has been on the fields covered by chapters II and III. However, in recent years there has been some shift in emphasis to the fields covered by chapters VI and VII, and more recently also to the field dealt with in chapter IV. The most modest research effort has probably gone into the field covered by chapter V.

Before trying to evaluate whether this has been a good choice of fields, and of emphasis between and within the chosen fields, and whether the research efforts have been successful, it is useful to discuss two broader issues concerning the Bank's research, namely

(1) What "visions" of the development process in the LDCs underlie, and should underlie, the accumulation and use of research knowledge concerning industry and trade in the Bank?

(2) What principles ("criteria") seem to guide and, in the light of the "visions" referred to above, should guide the research priorities of the Bank, and hence also the division between production and "import" of research knowledge by the Bank?

After a general discussion of these two issues, we shall discuss the possibilities of making production, import and the use ("dissemination" and "assimilation") of research more effective within the Bank (section 3). Finally, a summary is presented

of our suggestions for future priorities concerning research in the Bank in the field under consideration (section 4).

(1) Consequences of alternative visions of the development process

Given its type of organization, it is perhaps natural that the Bank does not have an official philosophy of how the development process should be shaped. However, to answer the question about what type of research knowledge that is useful for the Bank, it is nevertheless, necessary to have some "vision" of what the crucial factors are for economic development.

For instance, if we subscribe to a strong emphasis on central planning, research on nationwide planning models, and empirical studies of the process of central planning in various countries, including the possibilities of delegating authority and responsibility, would probably be top priorities. The reason why the Bank has not put many resources into the acquiring of research knowledge in this field is most likely that very few member countries follow that strategy of economic development, though of course elements of central planning exist everywhere, because of the great role of government decisionmaking in all economies of today.

A more modest version of central planning would be sectorial planning of investment decisions, for instance in sectors where there are large returns to scale, externalities, or (direct) intersectorial linkages. Then it may also be possible to consider aspects which are not usually well cought, if at all, in conventional static microeconomic investment calculations. With

this approach to development, or rather with this emphasis on development problems, investment programming and planning in some sectors would be of rather high priority, which it has in fact also been for the Bank in recent years (chapter VII), mainly in cases where the optimum size of a firm is of about the same magnitude (or larger) than the entire national market.[1] However, it is important to emphasize that microeconomic investment planning models of this type are quite consistent with a market-oriented philosophy of economic development. In fact, the research in the Bank in this field has not been pursued in the context of nationwide central planning, but rather as a means of exploring the range of choice by firms operating on markets. The same holds for Bank research on capacity utilization, capital-labor substitution and technological change (chapter VI) - a research field of great interest both in the case of centralized and decentralized visions of the development process.

Research knowledge on patterns of growth of production and trade (the field covered by chapter III) too is probably of considerable importance - in particular perhaps for acquiring a broad understanding of the development process - in the case of both rather centralized and more decentralized strategies of economic development. In particular, Bank research in this field has helped provide "norms" of growth patterns of industry and trade, against which developments in individual countries can be judged.

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1) The fact that such projects are often highly capitalintensive, also in countries with abundant supply of labor, is not an argument against careful studies of such projects. It is not less important for labor-abundant countries to economize with the scarce factor capital than to try to find labor-intensive projects.

The adherence to a pronounced decentralized vision of economic development does not imply the absence of central policies and planning, but rather an emphasis on policies that concentrate on institutional reforms and improvements of the system of incentives. With this emphasis on economic development it would be logical to try to find out how conducive alternative institutional arrangements and incentive systems are for releasing efficient decentralized initiatives. While research on incentives for firms (the field covered by chapter II) has been given a high priority in Bank research, the same cannot be said about research on incentives for employees (households) or on institutional arrangements (the field covered by chapter V), though an increased interest in institutional factors can be detected in various research efforts by the Bank in recent years.

As the economic systems of the LDCs which are members of the World Bank are characterized by various combinations of centralized and decentralized decision-making, with strong elements of both markets and centralized government economic decisionmaking, it is reasonable that the Bank tries to improve the understanding of both types of mechanisms, though in the context of market-oriented systems rather than economic systems characterized by central administrative allocation of resources.

(2) Criteria for the production and import of research

Given this rather "mixed" vision of development strategies, within the context of market-oriented economic systems,

the next question is what criteria should be applied when deciding the priorities of the production and import of research. It is tempting to try to decide this issue on the basis of the comparative advantage of the Bank as a research unit, and hence construct a "ranking list" of research areas in terms of falling comparative advantage of the Bank as a producer of research - a list to be "cut off" at the point where the research budget of the Bank is used up. It would seem that this approach to research priorities would follow from a research philosophy according to which the Bank, in the most efficient way possible, tries to contribute to the accumulation of research knowledge in the world as a whole. The choice of research priorities of the Bank would then be determined solely by the Bank's ability to produce research, and not by its internal demand for (use of) research knowledge.

On the basis of this approach, the following aspects of research priorities seem to be particularly relevant:

(a) The research of the Bank should concentrate on fields where competent researchers are available within the Bank, or (in a longer perspective) can be hired by the Bank.

(b) Bank research should exploit the skills and information that are acquired within the Bank in its operational activities as a lender and adviser.

(c) The Bank should try to produce statistical data and other information, where such information is more readily (cheaply) available to the Bank than to other organizations.

(d) The Bank should concentrate on large projects and projects where a continuity of research efforts is important.

A special reason why the World Bank has a comparative advantage relative to universities in research in areas such as (b) - (d) is that these activities, to be efficient, often require a rather strong and permanent research organization, which the social science departments of universities often do not have. Another very special reason why the Bank may be a suitable place for institutional research, relative to university institutions, is that institutional research so far has not gained a very high "status" in the academic world. Perhaps the World Bank could to some extent break out of the academic status ranking system?

Conclusion (a) would imply that the Bank continues with roughly the same kind of research as it has successfully pursued so far (assuming that leading researchers within the Bank are not likely to leave), but also that it moves into areas that are suitable for highly competent researchers who can be hired by the Bank. In fact, the choice of the Bank's research topics will probably always reflect the interests and background of "dominating" researchers in the Bank. This has certainly been the case in its previous research activities, as illustrated by the emphasis of research on trade policy, effective protection and domestic resource costs (the field of Bela Balassa), growth patterns (the field of Hollis Chenery, Don Keesing and others), and investment programming (the field of Ardy Stoutjesdijk and Larry Westphal).

In fact, a good forecast could have been made some years ago about the "revealed" research priorities of the Bank during recent years simply by looking at the "background" of the economists who had already been hired by the Bank!

By contrast, it would seem that projects dominated by "outsiders" have usually not succeeded as well as projects dominated by leading researchers permanently employed by the Bank. Perhaps open competition when choosing outside researchers could, in some cases, improve the quality of such research.

Conclusion (b) above would suggest a shift to fields such as comparative studies of the consequences of different types of institutions, rules and incentive systems in the markets for goods, services, credit and labor, including the role of government regulations and policies - and the implications of these circumstances for rates and patterns of economic development. In fact, some research capacities have already been built up in these fields within the Industrial and Finance Division (IFD) by way of sector reviews and studies of problems of small-scale enterprise and financial intermediaries. Studies of investment projects that are relevant for several countries at the same time may also be very suitable ones for the Bank.

Conclusion (c) would suggest a shift in Bank research activities to more collection, processing and publishing of data, and conclusion (d) a heavy emphasis on large projects and research where "updating" and "follow-up" research is important.

A strict adherence to the principle of "comparative advantage" in the production of research would imply that types of research knowledge which are not effectively produced by the Bank - regardless of how important they are for Bank operations - should be imported rather than produced by the Bank. It is obvious, however, that such a "comparative advantage" approach is not a sufficient criterion upon which to base Bank research strategies.

Firstly, the need of (demand for) scholarly knowledge in Bank operations cannot always be satisfied by importing research results (in fields where the Bank has not a comparative advantage in the production of research knowledge). One reason is the specificity of required knowledge, another is the lack of interest outside the Bank for certain types of research knowledge that the Bank needs (demands). Thus, in order to satisfy its own needs for research knowledge, the Bank certainly has to perform also a role as residual supplier of research in some fields.

What would be the concrete consequences of following this principle rather than the principle of comparative advantage in production?

In the light of the activities of the Bank as a lender, investor and policy adviser - and considering the often highly distorted relative prices in many LDCs - the heavy emphasis on studies by the Bank of effective protection and domestic resource costs could probably be defended on the basis of the principle of "residual supplier of research". In fact, it would seem that these studies have been regarded as particularly useful by

operations people, though some complaint comes out to the effect that the techniques may have been somewhat "overelaborated" for the purpose of Bank operations.

Another inference of the principle of "residual supplier of research" is probably that it motivates research concerning large investment projects (in particular where the Bank is involved as lender), including analyses of the externalities (such as learning by doing) of the projects, returns to scale and the linkages between sectors. The research within the Bank on investment planning and programming is an example of this type of research for which an important point of contact seems to be the Industrial Projects Department (IPD). It would appear, however, that the operational staff of the Bank, particularly in the regional offices, has usually not found the research done in this field very helpful.

We would argue that an adherence to the principle of "the residual supplier of research" motivates studies also concerning problems about which Bank research has not so far been strongly involved, but which in our judgement reflect severe bottlenecks for economic development in many LDCs. This brings us back to a recommendation of some research that earlier was motivated by "comparative advantage principle", i.e. research on <u>institutions</u>, <u>distortions of incentives</u> and <u>the consequences of government</u> regulations. This argument is probably particularly strong if the Bank would choose to concentrate research more than earlier on the least developed LDCs, and on the consequences of industrialization for the least favored group within individual countries.

Thus, the residual supply of research approach and the comparative advantage approach both seem to imply a strong emphasis on studies of the consequences of alternative institutional arrangements, incentives and government regulations. The reason is that both approaches to research are based on the assumption that research should be related to the fields of Bank operations - either because the Bank acquires special competence on such issues by way of its operations, or because knowledge is needed in these fields for Bank operations (and not easily imported).

A second reason why Bank research cannot be based only on the principle of comparative advantage in the production of research is that there are important "externalities" of research within an organization. In many cases research done within the Bank, and by Bank staff, may be more "visible" to the operations people in the Bank than research done elsewhere, even when the work is identical. Moreover, the general level of sophistication of an organization, for instance in the field of policy advising and economic surveying, is probably influenced by the general quality of the researchers within the organization. The presence of good researchers, like competent people in general, helps to set standards of performance within an organization, which is particularly important in one that performs the role of policy adviser. Moreover, the reputation of the Bank as an institution of high competence may be boosted by a high research capacity. Such a reputation may help the Bank to hire talented people in general, and hence improve the possibilities of the Bank to work effi-

ciently, and perhaps even to "survive" in a long-run perspective.

In other words, the research of the Bank should not be subordinate only to the (relative) efficiency of the Bank as a producer of the research, or to the immediate demands of the operating units of the Bank, but also to long-run considerations of the general competence of the Bank in various respects. An application of these principles suggests that the Bank should build up research competence in many fields where it operates - regardless of what research priorities that would follow from the application of the principle of "comparative advantage" or the principle of "residual supply of research".

Thirdly, the Bank should also be interested in the effect of the "externalities" of its research on the research potential of the LDCs. The adherence to this principle is an argument for organizing joint ventures by researchers of the Bank and individual scholars and research institutions in the LDCs. However, there is some risk, of course, both that the Bank then will not always get the most competent researcher for a specific project, and that the Bank will be criticized for "distorting" research in the LDCs ("research imperialism").

In reality, it would appear that all these four principles for research do prevail within the Bank. Controversies over research strategies within the Bank probably often derive just from the different weights that various staff members put on these various principles. Disappointments over the research activities of the Bank are bound to be felt by those who evaluate the

research efforts of the Bank on the basis of only one of these principles.

It would seem to us that the management of the Bank should clarify, to itself as well as to others, which of these principles (motives), or possibly others, that should be emphasized.

(3) How to make import, production and dissemination of research more effective?

Import of research knowledge

The size of the research budget of the Bank is rather modest. Approximately $ 10 million are officially earmarked for economic research. Out of this approximately $ Y are used for research on industry and trade, with an input of researchers in this field corresponding to about 10-11 man-years. However, with a more "liberal" definition of economic research - to include country studies and empirical studies of sectors and markets - another $ 25 million should probably be added, raising expenditures on economic research from 4 to 14 percent of the administrative budget of the Bank.

But, regardless of definitions, the research that is made within the Bank will always be only a marginal contribution to the pool of knowledge that is relevant for operational people within the Bank. The bulk of research knowledge that is potentially useful within the Bank certainly will be produced outside the Bank. Thus, the issue of "dissemination" and "assimilation" of research knowledge within the Bank should be

connected with research knowledge in general rather than with research knowledge that is produced by the Bank itself. We therefore suggest that the Bank strengthens its capacity to import research knowledge in a systematic way. One of the most efficient ways of doing this is probably to place people with a research background in operating positions in various units within the Bank, so that research knowledge can be imported not only via researchers of the Bank, but also "directly" by the operating staff. In fact, the biggest import of research knowledge probably occurs when someone with a background as researcher is hired by the Bank; knowledge is often most effectively imported "in the heads" of people already when they are employed, rather than by reading research documents or doing research later on. If the Bank is anxious that research which is financed by the Bank is highly relevant for Bank operations, i.e. if a heavy emphasis is put on the principle of "the residual supply of research", it may be a good idea not only to use the most outstanding consultants who are available, but also to build up a "network" of more or less permanently Bank-affiliated "outside" researchers. These could then acquire some knowledge about the use, and usefulness, of research within the Bank.

Production of research

If the Bank in its own research activities is more than earlier going to emphasize research on institutional issues, the most important thing to do is probably to make new hirings of specialists in fields relevant for such research. What this means in concrete terms has to be considered carefully by the

Bank. One obvious possibility would be to hire some specialists in industrial organization, competition, entry and innovation. Specialists in "relevant aspects" of credit market analysis and labor economics may also be important, if the Bank wants to put a heavier emphasis than previously on studies of "market imperfections" in the markets for credit and labor. Specialists in applied research on economic systems and analytical aspects of modern economic history and economic policy analysis might also be of interest to the Bank if projects are going to be launched in order to highlight "success stories" and "failure stories".

It is also conceivable that a broader social-science sweep would be useful, e.g. to try to catch psychological and sociological factors in economic development, for instance to shed some light on work ethics and the conditions under which entrepreneurship is likely to flourish. If such an approach is attempted, researchers with a broader background than "technical" economics would probably have to be hired, at least as consultants.

Dissemination of research knowledge

When trying to improve the use of research knowledge - imported as well as produced - within the operating units of the Bank, considerable improvements in the processes of "dissemination" and "assimilation" of research within the Bank are called for. In fact, one of the most striking findings of our interviews among people in the Bank is the enormous "gap" - one is tempted to say tension - between researchers and operating officers.

Researchers within an organization that deals with "practical affairs" will probably always be somewhat of an "academic enclave". Research is a full-time, highly specialized job, which has to be "protected" to a large extent from demands from practical and administrative duties. The "enclave" character of a research unit helps to give such a "protection", and thus helps to create the "community of scholars" in which high-quality research can be generated. In fact, if an organization like the Bank wants to acquire and keep competent researchers, it is necessary to let them "do their own thing" to a large extent, without too many disturbances from other activities within the organization.

Moreover, researchers are usually concerned with a much longer time perspective than operating officers. And, whereas researchers are usually interested in the accumulation of generalized knowledge, operating people are more interested in drawing on knowledge, in particular on rather specific "knowledge about time and place". The researcher often regards the search for the latter type of knowledge as "information gathering" rather than research. Operating people, by contrast, are frequently disappointed by research results because these do not always give concrete, easily accessible, ready-made and unambiguous conclusions about immediately relevant policy issues. The "production period" of research is, moreover, often so long that when results do emerge, operating people may have lost interest in the question. And sometimes the empirical data which are used in research projects may no longer reflect existing conditions. (To some extent the studies

of effective protection and domestic resources costs, have suffered from this dilemma.)

Besides, many operating officers are not aware of, interested in, or able to absorb results of research or paradigms supplied by the researchers. In fact, usually they cannot possibly know in advance the type of research that could help them in their work.

Thus, for good research to be made, researchers should not, in our vies, only do the things that are immediately relevant to operating officers. On the other hand, it is also obvious that it would be fruitful if researchers were better informed about the usefulness of research knowledge among operating people, and if researchers could communicate more effectively with operating officers.

To help solve some of these problems of "dissemination", "assimilation" and "feed back" on research issues within the Bank, several reforms suggest themselves.

(1) That the researchers write, and circulate within the Bank, popularly written reports on research - concerning research produced both inside and outside the Bank. In some cases it may be a good idea to ask outside consultants, rather than researchers inside the Bank to make surveys. However, when outside research results and paradigms are summarized, it is probably important that not only outstanding "academic" contributions are summarized. It may also be useful to try to find out what types of research that have been successfully used in other "operating" organizations.

(2) That joint seminars are organized by researchers and operating people - preferably at some distance from Washington (with disconnected telephones!) to make undisturbed discussions possible.

(3) That more circulation of people between research and operating activities is brought about. "Sabbatical" leave for research, within or outside the Bank, for the operational staff may be one method of achieving this. Such circulation may be difficult to achieve in the field of methodological and highly technical (model-oriented) research, where the rate of skill depreciation is often very rapid. However, in more applied fields - where experience, empirical knowledge and common sense are important - circulation may be both possible and highly useful.

(4) That attempts are made to bring about more research suggestions from operations people, and to form more joint ventures between researchers and operating people - certainly in operating activities, but also in the design and to some extent also in the execution of research. More informal - i.e. less bureaucratic - procedures when drafting and planning new research projects would probably increase the possibilities of operating units to contribute to initiating and participating in research.

(5) The establishment of some minor research units within the operation units, such as within regional offices, would probably also help the dissemination and assimilation of research results among the staff members of the operating units.

(6) Moreover, the earlier suggested employment of people with research background in operating positions would not only facilitate the import of research knowledge to the Bank; it would also be a way of "disseminating" and "assimilating" research knowledge within the Bank from researchers to the operating officers. This is potentially important, as imported research may be more diffecult to disseminate and assimilate than "in-house research".

It is important to realize that the limits of using more research knowledge within the Bank are probably determined more by the "absorptive capacity" of research among the operating people - limited time as well as limited ability and interest to absorb research knowledge - than by the capacity of researchers within the Bank to produce and summarize research. This means that a larger volume of research within the Bank should perhaps not be expected to have much effect on the operational side of the Bank, as long as the deficiencies of the systems of dissemination and assimilation of research within the Bank have not been removed.

Also the procedure of the research within the Bank should to some extent be influenced by the principles (motives) that govern Bank research. If the Bank is simply trying to make the best possible contribution to the research knowledge of the world, a rather concentrated research portfolio is suggested. It is then also important to allow a very broad freedom for the researchers "to do their own thing". Moreover, the more successful the Bank is in hiring competent scholars, the smaller the need for strictly formal organizations, and bureaucratic administration of research within the Bank.

On the other hand, if the Bank follows the "residual supply of research strategy", it is necessary to see to it, by way of organizating and monitoring research, that the research becomes "relevant" for the operations in the Bank.

If instead a heavy emphasis is put on the idea of creating "high sophistication" among the Bank staff in general, a rather dispersed research portfolio would probably follow, perhaps with some risk of not achieving the "critical mass" of resources that is necessary for a breakthrough on the international research frontier. Thus, this research principle comes into some conflict with the others because of returns to scale in research.

Finally, if a high priority is given to the ambition to create research capacity in the LDCs, the interests of research institutes there should probably play a major role in choosing research research projects. Participation of researchers from the LDCs then becomes a crucial criterion in the design of research projects. Research would then often have to be organized as joint ventures, with a rather concentrated research portfolio of the Bank to assure reasonable efficiency. (The studies of effective protection illustrate that this can successfully be done.)

(4) Summary of recommended research priorities

In the discussion above, a distinction was made between four different principles (motives) for research within the Bank. It was argued that different principles suggest somewhat differ-

ent priorities and strategies of research. However, rather than giving unconditional recommendations, we have chosen to make our recommendations conditional on the emphasis of the Bank on these various principles. However, if we would emphasize some recommendations more than others, we would suggest that research is concentrated on fields where

(a) knowledge is particularly strongly needed for Bank lending and policy advising, as suggested by the principle of "residual supply of research";

(b) the Bank in its operations acquires knowledge that is unique as compared to other institutions, as suggested by the principle of "comparative advantage";

(c) a strong organization and follow-up of research, mainly in the case of large projects, is required.

We argued above that the comparative advantage approach suggests a considerable emphasis on the generation and compilation of data and other inforamtion that comes out "naturally" from the operational activities of the Bank. However, to make this latter activity a main task of the Bank - i.e. to turn the Bank into a dominant "data Bank" in the development field - would require truly enormous resources. We know how great such a task is already on a national scale. To do the same thing for about 100 countries would therefore be a formidable task. We will therefore not go further on this issue than to recommend that the Bank takes a greater responsibility for the data which it actually collects and uses in its own research and surveys.

Resource constraints make it necessary, we believe, to take a rather selective approach to the collection, processing and publication of data.

We also argued above that a strong emphasis on both the comparative advantage approach and the residual supply of research approach suggests a rather high priority for analytical research on institutions, including the systems of incentives and government intervention. (In some cases it may even be possible, and of interest, to explain how certain types of institutions tend to emerge under various circumstances.) We believe that the Bank should seriously consider greater research efforts in this field.

Examples of topics along these lines include:

Studies of the consequences for industry and trade of various types of market imperfections and institutional peculiarities - with conceivable consequences for the allocation of resources, entry of firms, and innovation. Concrete examples are (1) imperfection in credit markets, for instance the discrimination of credit allocations, including widely differing interest rates for different firms; (2) discriminatory effects of systems of licensing and rationing of permits for investment, imports and the purchases of intermediary products; (3) price controls and restrictions on the return on capital; (4) deficiencies in the infrastructure including the weakness in training of managers, technicians and skilled workers; (5) market imperfections created by the tax system, such as discrimination of certain types of income (sometimes due to tax evasions); (6) problems related to labor-management relations; (7) the supply of and

the obstacles for entrepreneurship; (8) the role of public enterprises; (9) the role of marketing (trading) firms and technical service centers, free zones and multinationals; (10) incentives and training facilities for employees to migrate, shift job and acquire skills; (11) the effects of minimum wage legislation, union policies and rules about hiring and firing employees - with conceivable effects also on the choice of technologies of firms; (12) the supply of highly competent "national elites" - public administrators, engineers, managers, and perhaps in particular (considering our interest here for the development of industry and trade) entrepreneurs and innovators.

Thus, in general we would like to suggest that the Bank takes initiatives to begin studies of problems of industrial organization and microeconomic efficiency - not only "allocative efficiency", but also what Harvey Leibenstein has baptized "X-efficiency", i.e. basically the problem of "efficienty slack".

The list of interesting problems related to the role of institutions can of course be made very long, and a choice of a limited number of projects has to be made. In fact the difficult task is not to enumerate important research topics, but to cut down the research ambitions to reasonable size. However, in view of the enormously important role that entrepreneurial initiatives has played historically in the present developed economies, we do suggest a serious attempt to study in particular the obstacles to entrepreneurship, entry of firms and innovation. The fact that nearly half of

Bank lending to industry goes through Development Finance Companies (DFCs), which finance small and medium-sized firms, suggests that the availability of entrepreneurs and the obstacles to entry and expansion of small and medium-sized firms are potentially important to study. Our suggestions also imply that the emphasis of the study of firms is shifted from optimization studies of the firm (or sector) to behavior studies of firms, and from problems of choice of project to the problems of implementation of projects. This would include more emphasis on various institutional constraints and imperfections of implementation - red tape, improper organization, inappropriate incentives of management, inadequate skills and counterproductive political interventions. We believe that the potential gains from designing more effective organizational and institutional frameworks and better incentive systems, both for managers and for employees, are very large - perhaps even larger than the gains that can be achieved by better selection of projects.

We have in discussions with operating officers in the Bank got a strong impression that more information on institutional issues - in particular perhaps entrepreneurship and discrimination of certain types of firms and activities - is highly useful for Bank activities, in lending as well as policy advising. The good reception of previous research on effective protection and domestic resource costs also suggests that research on various types of distortions in prices and resource allocation would be of interest for operating people. In fact, studies of the consequences of various types of government interventions, and various types of "spontaneous" market imper-

fections, may both be regarded as an extension of the previous studies of effective protection and resource costs. Examples of studies where similar types of quantifications may be possible are the "excess costs" of requirements of domestic components in production and of a certain compulsory export share for domestic output.

These recommendations imply that studies of incentives for firms should be shifted somewhat from trade to production in general, and that incentives for employees, and hence imperfections in the labor market, should be given more emphasis. It is also our judgement that a potentially very serious obstacle to industrialization and trade of the LDCs stems from limited access to export markets. As the Bank has recently launched large projects on the issue of access to markets in the DCs, it may be a good idea to consider some future studies of the possibilities of expanding trade among the LDCs themselves.

Areas where research could perhaps be cut down are the projects such as "sources of growth", and purely descriptive institutional studies, as we want to emphasize that good institutional research requires a very high level of competence, and also the development and modification of methodologies. Thus, a stronger emphasis on institutional research would not reduce the need for the researchers of the Bank to follow, and contribute to, methodological research.

A.L.
Sept. 27, 1978

EXAMPLES OF QUESTIONS ABOUT WORLD BANK PANEL ON INDUSTRY AND TRADE

(1) What are the main reasons for making research in the Bank?

(a) To contribute to knowledge in the world about the development process; "comparative advantage approach" then adequate.

(b) To get the knowledge that is needed for Bank operations - knowledge that cannot be imported at lower costs to the Bank? "Residual supply of research approach" then adequate.

(c) To create externalities, in the form of "sophistication" among staff of the Bank.

(d) To help generate research capacities in the LDCs?

(2) What are the possibilities of importing research knowledge rather than producing research within the Bank?

(a) By employing people with research knowledge.

(b) By systematically summarizing and disseminating imported research knowledge within the Bank.

(3) Are there overlappings with other UN organizations? Is cooperation with other UN organizations possible and useful?

(4) Is there a case for more systematic data collection activities by the Bank? How great should the responsibility of the Bank be for the data it publishes?

(5) Are research reports read by operating people? Could they be induced to read them more? Are they worth reading for operating people? Is there any feedback to researchers? How much?

(6) Is it possible to study the importance of research within the Bank by going through systematically some general reports by the Banks, possibly also some country studies, to see if the quality has increased over time? Should this task be suggested to the General Panel?

(7) To what extent is research suggested by (a) operating people, (b) researchers with operation background, (c) pure researchers, and (d) LDC representatives?

(8) Is it possible to get some impression how LDC representatives evaluate the research done by the Bank?

(9) Is the Bank a suitable body for "institutional research" as suggested in my draft to Chapt. I? Or are there political obstacles for the Bank to pursue such studies?

(10) Would it be a good idea to give research grants to researchers outside the Bank to get research on issues where the Bank itself is not the ideal organization for research - for instance in the case of highly sensitive issues?

(11) Is "circulation" between researchers and operating staff impossible because of the rapid deterioration of research capacities of people when they do other things?

(12) Will good researchers in fact always be something of an "enclave" because of the special features and long time horizon of that type of work?

(13) Would it be a good idea to make a small research division within each region - with good connections between these researchers both with researchers in the main research departments in the Bank and with the operating people in the regional offices? Some of these researchers in the regional divisions will then most likely move over to operating activities.

(14) How important is it to study incentives for employees - for instance incentives to acquire skills? Are wage rates flexible enough to create incentives both to acquire skills and to reallocate labor?

(15) Are the studies just started about access to markets in the DCs enough, or should even more resources be put into that field?

(16) Should the roles of the multinationals and free zones be studied more carefully?

(17) Should more studies be done about technology transfer?

(18) Should studies of central planning, or sectorial planning, be given a higher or lower priority?

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Draft.
For Circulation Within the
Industry and Trade Panel only.

COMPARATIVE ADVANTAGE; TRADE PATTERNS; ECONOMIC GROWTH

Edmar L. Bacha
October 1978

There are six RPO projects under this heading plus two non-RPO papers by Bela Balassa. There follows a brief description of title, content, organization and present status of the research projects. A summary evaluation closes each sub-section. At the end of the paper a more general evaluation is provided.

670-07: International Model

This project proposes to construct an international programming model for the world economy, to study problems of interest to developing countries, such as the consequences of changes in tariff rates, varying growth rates of developed countries, and oil price increases. There are sub-models for each of the three main developing regions (Latin-America, Asia and Africa), for the developed world and for the oil producers. The model is based on the principles of general equilibrium theory, and makes extensive use of activity analysis procedures.

The model was contracted out in September 1972, with the work being carried out by Victor Ginsburgh and Jean Waelbrock, both as outside consultants (Waelbrock worked for a while at the Bank). The project is supervised by Bela Balassa. The latest completion data is set for the Autumn of 1978.

The reviewer had access to two papers of a methodological nature, the first describing the computational algorithm and the second presenting the "General Equilibrium Model of World Trade". The accomplishments of these papers are not negligible. According to the authors, "this seems to be the first successful computation of a general equilibrium for a large realistic model". The use of a GE model also" forces the model builder to incorporate only theoretically

significant - [illegible] - constraints, avoiding the use of the crude heuristics which play such a large role in development planning models".

But, once the theoreticians have decided to come down to the real world, they must accept its crude rule that the taste of the pudding is in the eating. From this perspective, a judgement on the project must be suspended until its empirical findings are published and its results compared with those of less sophisticated world models.

670-19: Expansion in manufacturing for exports in developing countries

This project proposes to analyze which industries are moving out of industrialized countries because of high wages and labor shortages into low-wage developing countries. It intends to survey export industries that have been transferred to Singarope, Taiwan, Korea (and possibly Mexico), as well as to sample international firms in Japan, the U.S., and Europe, on their outlook for further shifts of export manufacturing operations to LDCs.

The objective is to provide developing countries with information for planning export industries. Knowledge should be added on (a) segments of industry that have already moved to developing countries, (b) manpower and ancillary industrial requirements, (c) dependence on foreign partners for technology and marketing, and (d) outlook for access to foreign markets in Japan, the U.S., and Europe.

Jack Baranson was the staff member responsible for the project, the first contract for which was drawn late in 1971. Two papers were written by outside consultants. Terutono Osawa wrote one piece on the migration of Japanese industries to Taiwan and South Korea, and Y.S. Chang wrote a paper on the offshore activities of the Japanese electronics industry. The project was cut short by Baranson's departure from the Bank.

An internal evaluation report is available on the two papers, concluding that while they produced some useful information, they are not of good quality. Both papers are in fact very descriptive. But Mr. Osawa at least delivers his message in a readable format, while Mr. Chang's paper is a poorly written dossier, with interest only to market research analysts in the electronics industry. The project was a failure from its inception. In view of its poor design, most probably

it would lead nowhere even if Jack Baranson had stayed in the Bank.

670-79: Economic Development of East and Southeast Asia

As the previous project, the objective of this one is to identify and analyze the industries most likely to find it advantageous to shift all or part of their processing activities from Japan to East and Southeast Asian countries.

The study was divided into two parts. The first was macroeconomic in nature, involving projections of the Japanese economy and of the structure of trade between Japan and other main regions through 1985. In the second part, selected industries, such as textiles, electrical machinery, steel and miscellaneous manufactures, were studied in more detail to identify their changing comparative advantage within the Japanese economy.

The project was supervised by Parvez Hasan, and carried out by the staff of the International Development Center of Japan. It lasted from June 1973 to August 1974, when a draft final report was completed.

This draft was not made available to the reviewer. However, a completion report by Mr. Hasan says that the draft was disappointing because it did not provide a comprehensive or cohesive view of Japan's economic relationship with East and Southeast Asia in the coming decade, which was the main objective of the study. Apparently, the Bank requested a revised version of the paper, but the I.D.C.J. was unable to provide it.

This project, although producing some useful information, also can be considered a failure. Much was promised but only a few projection exercises without much interest were delivered.

671-05: Patterns of Industrial Development

As far as this reviewer coul understand, the purpose of this project is to provide a consistent data set for the following two projects on sources of industrial growth. More specifically, the objective is the organization of macroeconomic industry and trade data banks at the World Bank. The economic analysis is limited to updating the Chenery-Taylor regressions on patterns of industrial

growth, with some marginal methodological improvements.

The project was started in early 1976 under the responsability of Vinod Prakash of the Development Economics Department. Completion was expected for October 1978.

This reader had access to two papers by Vinod Prakash, with the second, on the measurement of industrial exports, being and improved version of part of the first one, on statistical indicators of industrial development. Alternative definitions of industrial exports, commonly used by U.N. agencies and economic researchers, are tested. The conclusion is that these definitions are not interchangeable as commonly believed. Hence, there is an urgent need for a standard definition of industrial exports if the data base for country comparative studies is to be improved. Adoption by all countries of SITC (Rev.2) would permit such uniformization.

This project seems most useful, not only for the sources of growth studies, but fot the World Bank work on industry and trade more generally. Its conclusions should be discussed with the operations staff of the Bank, for apparently some statistical pitfalls are related to specific country procedures which country specialists may clarify. For example, the discrepancy pointed out by Prakash in industrial value added as between the National Accounts and the Census in Brazil is only apparent. The problem is that the Brazilian Census Bureau uses the concept of "value of industrial production" which is an intermediate concept between value of production and value added.

Users Guides to the data bank have been written and it would be interesting to learn if the operations staff of the Bank are effectively using these files in their country and sector analyses.

671-32 : A Comparative Study of the Sources of Industrial Growth and Structural Change

This project is designed to contribute to an empirically based theory of industrialization, that Hollis Chenery and associates have been building for the last 19 years.

For each of eight countries, the sources of industrial growth and structural change are determined using input-output data. Determination of these sources start from the accounting identity:

$$X_{it} = D_{it} + W_{it} + E_{it} - M_{it} \quad (I)$$

where: X, domestic production; D, domestic final demand; W, domestic intermediate demand; E, exports : i, sector; t, year.

Observed changes in the X_{it}'s through time are attributed to changes in each of the "sources" on the RHS, and "growth contributions" are computed for each of these demand components.

Deviations of the X_{it}'s from a proportional expansion path (where the factor of proportionality is the growth factor of domestic income or aggregate value added) are also calculated. Such deviations from homogeneous growth are designed as "structural change". Application of formulae derived from (1) permits the calculation of the "contributions to structural change" of each of the demand components in the RHS of the equation.

Emphasis of the analysis is placed on the terms E_{it} and M_{it}. The purpose is an evaluation of import substitution and export promotion strategies from a long-term, sector-by-sector perspective, stressing questions of sequencing as well as problems of transition to a flexible, viable industrial structure.

Paralel to the country studies, simulation exercises are developed to assess the relative importance of universal and country specific influences in industrial structure and growth. "Normal" patterns for the relative contributions of each demand component to industrial growth and structural change are estimated from cross-country regressions. These "normal" or universal patterns are assumed to vary with per capita income, population size, and factor endowment of the country. Deviations from "normality" are country specific and hopefully may be explained by the development strategy and associated government policies of the country under consideration.

The project started in early 1976 and completion is expected for late 1978. People responsible for the project include Sherman Robinson, Yuji Kubo, Hollis Chenery, Larry Westphal and Moyses Syrquin.

Only part of one country study (on Norway, by Bela Balassa) was made available to the reviewer. Three other papers were read, on the cross-country simulation study, authored by Chenery and Syrquin.

This project may be considered as the end-product of a formidable enterprise to establish an empirically based paradigm for modern industrial growth. It demonstrates once again the power that simple ideas may have for the development of economic knowledge. Chenery's

seminal 1960 paper consisted of little more than the numerical estimation of an accouting identity. However, as his papers for the Nobel Symposium and for the Tokyo IEA Congress (the later co-autored by Syrquin) demonstrate, such simple exercises within an 18-year period allowed the organization of a most impressive body of knowledge regarding the nature of modern industrial growth.

It is disputable whether or not this project will achieve its ambitious initial aim, to develop an analytical framework to articulate the connections between individual policy instruments, changes in industrial structure, and economic performance. We must wait for the project final report to see how close Chenery and associates have come towards this goal. However, the papers reviewed are indicative of the high quality of the work done, including the important methodological contributions by Balassa and Syrquin to the measure of import substitution.

671-79 : Sources of Growth and Productivity Change

This project is a follow-on to the previous one (RPO 671-32) with specific focus on Korea, Turkey and Yugoslavia.

Three levels of study are contemplated: (1) linking the demand oriented analysis of the previous project to the study of sources of growth from the supply side; (2) constructing price-endogenous programming models for the three countries, aiming at a "consistent, comparable and rigorous" analysis of different policy packages, and (3) complementing the previous analysis with a micro-focussed study of two common industrial sectors in the three countries.

The project started last summer and completion is expected for late 1980. Sherman Robinson directs this research project, with Kemal Dervis, Larry Westphal and Yuji Kubo being involved in planning or carrying on the work.

The reviewer had access to the research proposal, that contains two appendices, one on the Turkey model and the other on the decomposition of sources of growth according to factor inputs and technical change.

The study of sources of growth from the supply side seems harmless enough. It is a useful way of organizing relevant economic data, which the demand-oriented view of the previous project leaves relatively untouched. However, after the Cambridge controversy on

capital theory and the methodological and empirical criticisms of this type of work by Frank Fisher and Griliches and Jorgenson, one perhaps should approach the study of production function decomposition with more modesty than is apparent in Appendix A to the research proposal.

The micro-focussed analysis of two sub-sectors seems to be the most promising part of the research. Unfortunately, the proposal is somewhat opaque not only on the choice of the sectors but also on the methodological approach to be adopted.

The price-endogenous multi-sector programming models are presented in the proposal as a superior way of looking at [illegible] industrialization processes. They would overcome the partiality of the "sources of growth" studies, and provide and integrated approach to the problem of industrial expansion. Experience says differently. Accumulated knowledge on the development of such models indicate that their main merit is as organizing devices for the collection of relevant data for economic policy making. The empirical results that they produce, if they make sense (which is not often) can as well be obtained much more inexpensively from simple macroeconomic formulations.

In view of this experience, the reviewer feels that is is wrong to say that multi-sector models are a step ahead of demand oriented sources of growth studies. Theory is simply not firm enough to allow a reasonable complete specification of the most relevant socio-economic interactions in the process of industrial growth. It seems more appropriate to accept with scientific modesty the enormous size of our ignorance, use simple tools and proceed bit by bit. The answer lies not in implementing programming models, but in devising simple ways of approaching critical socio-economic relations, from the empirical exploration of which additional knowledge may be generated.

"Let one thousand flowers flourish", advised Chairman Mao. For the sake of progress in experimental economics, it seems useful to continue attempting to implement empirically large GE models. But, in this case, let us follow Ginsburgh and Waelbrock's track in RPO 670-07 and rigorously incorporate the full flavor of advanced general equilibrium theory in these models.

NON-RPO : Two papers by Bela Balassa

The papers by Bela Balassa consist of empirical tests of important predictions of orthodox trade theory. Trade barriers are presumed to reduce international trade flows and affect the international location of production. This topic is analyzed empirically in Balassa's contribution to the Nobel Symposium.

Balassa's paper to the Tokyo IEA Congress tests the prediction that comparative advantage in trade in manufactures, as revealed by relative export shares, is affected by the capital labor ratio of trading countries.

In devising his tests, Balassa demonstrates once again his justly praised ingenuity to implement empirically abstract economic theories. His results are most conforting to orthodox trade theory.

This reader's only complaint relates to Balassa's propensity to carry his findings perhaps a bit too far. For example, consider his assertion on p.24 of the IEA paper: "The empirical estimates show that intercountry differences in the structure of exports are in large part explained by differences in physical and human capital endowments". First, alternative theories were not tested; the empirical analysis refers to the statistical significance of the relevant coefficients for the Heckscher-Ohlin hypothesis, investigated by means of ordinary least squares. Second, the coefficients of determination of the regressions explaining export shares are not published. Hence, the author can say that his results are statistically significant, but not that they explain a large part of the differences in export structures.

General remarks

Seven projects were analyzed. One, consisting of two non-RPO papers by Balassa, was completed successfully. Two others, on the migration of industries from Japan to South East Asia, were clear failures. A fourth one, a general equilibrium model of international trade, has not yet produced empirical results (but its methodological contributions looks most impressive to a non-specialist like the reviewer). The three others are on sources of industrial growth and strutuctural change: one is designed to organized a data bank on relevant industry and trade magnitudes; a second has only recently started; and a third is about to conclude - but its eight country studies have not yet been made available.

Excepting the two failures, all the material that was reviewed is of the best quality that one can find anywhere in the profession. One may argue with methodologies or implicit ideologies; competence is undisputable.

There is one important lesson to be learned from the failures. The WB research group does not know how to deal with consultants outside the Big Family. Here, much perhaps can be learned from the experience of Ford Foundation with its system of open world competitions. Besides hiring outside consultants to work on projects formulated by the staff, the WB should design topics of general interest in the areas of industry and trade. Then, independently of its staff, should open an international competition for projects in the area, big or small. There should be a guarantee that these international competitions, with a reasonable amount of money and even a grant element involved, would be opened year after year. Given this guarantee, I envisage the possibility of creating in different LDCs nuclei of competence in economic research, which could contribute significantly to the expansion of research capacity in these countries. The Bank should be prepared to accept proposals with a "local tate", for there lies the immediate concern of research groups in LDCs. A global prespective is the responsability of the WB staff, but this should not be imposed on LDCs researchers. The art of designing the world competitionswould lie on the compatibilization of the interests and competence of LDCs researchers on local topics with the WB need for a universal outlook.

BUENO

DONGES

Juergen B. Donges

1st Draft
October 1978

Evaluation of Bank Research on Industry and Trade:

- Incentive Policies; Economic Integration -

1. The following discussion is based on a sample of five RPO and four non-RPO projects (as enumerated in the annex). Most of them dealt with the role of incentive systems, particularly trade policies, in economic development, from both a theoretical and an empirical standpoint. In view of the widespread belief among policy-makers in many developing countries (LDCs) that they cannot develop (i.e. industrialize) their economies without a direct interference in the market mechanism, the focus of these projects is of essential nature on the applied level. Not only could the findings, if accurately substantiated, provide the government officials of LDCs with guidelines for appraising the allocative, growth, distributional and balance-of-payments impact of the incentive regimes, and for reforming them where necessary. The studies could also strengthen the ability of the Bank's operational departments to assess both the economic feasibility of individual investment projects and the overall effects of the economic policies pursued in LDCs. Most of the studies under review meet these objectives.

2. The studies, which have been completed so far, show three distinct features: one is the high professional quality of the work. This has allowed various authors to already publish part of the research results in highly reputable journals. Second, in most of the cases the authors have made a substantial effort to improve the methodology for policy analysis and investment appraisal. The Bank's research has been insofar to a large extent creative rather than imitating. Third, the applied component of the research has been generally com-

plementary to the research in the field undertaken elsewhere (U.N. organizations, OECD, academic research institutions). There has been, however, some overlapping with regard to the LDCs chosen for analysis, which is perhaps a reflection of the uneven distribution of useful statistical data among LDCs.

3. From a policy analysis point of view, a major contribution is the project 670-01 on "Development Strategies in Semi-Industrial Countries" (DS), the countries being Argentina, Colombia, Israel, Korea, Singapore, and Taiwan. Argentina and Singapore are relatively new in the group of countries studied in this field, which is an important aspect in itself, because they represent the two extremes of economic policy shaping: highly interventionistic in one case, and strongly market-oriented in the other. The six country studies could no doubt also profit from prior methodological and empirical research done in and outside the Bank, and so did the comparative analysis of the experience of the Six. On the whole, the policy conclusions and recommendations rest upon firm theoretical foundations and a sound factual basis.

4. The methodological framework underlying this (and most other) project(s) is the effective protection concept. It has been extended to include export subsidies as well as credit and tax preferences, in addition to import tariffs and quotas. By doing this, fortunately of a reasonable level of sector disaggregation, the DS project has increased the knowledge inside and outside the Bank about the effects of incentive regimes. This study is a good example of how analytical tools, which have proven useful in earlier analyses, can be improved in theoretical and computational terms. It is particularly noteworthy that, unlike many other studies in this field, a

great effort has been made to collect comparative price data. Only price comparisons between domestic production and import values make it possible to calculate overall effective protection (i.e. including non-tariff measures) and to identify the degree of tariff redundancy which often exists.

5. That the analysis has been carried out in a partial equilibrium framework, does not reduce its practical relevance, provided the estimates are taken as rough orders of magnitude and their economic implications are interpreted in a comparative way rather than in isolation. General equilibrium models tend to have a rather limited explanatory power, let alone their high sensibility to the parameter specifications. What could have been wished from the user's point of view, however, is either that the country studies had been completed earlier or that the quantitative estimates had been more updated. The quantification of the incentive measures refer to the end-sixties. While this is fine to understand the past economic performance of the countries under study, most sample countries have changed these measures, especially those related to the foreign sector, significantly since then. By not including these changes in the analysis, the DS study has missed the chance to make the results even more significant. Of course, we are aware of the practical difficulties in maintaining up-to-date a comprehensive analysis as this one. On the other hand, the Bank may be, as compared to academic institutions, in a favourable position to make such an effort; it has the staff and it can collect the required information through the economic missions which regularly review the LDCs.

6. The message of the research on incentive schemes is that whenever LDCs want to industrialize their economies and think that this objective requires government assistance, they should

promote rather than protect industries. This implies, for instance, that import substitution should and could be achieved without discriminating against exports, particularly non-traditional manufactured exports, as it is so often the case in reality. Neutrality between production for domestic sales and for exports is in the interest of LDCs because, as the DS research shows, it will result in faster growth, more employment creation and higher levels of efficiency than when industrialization is aided only in relation to the home market. These are conclusions which can be used immediately by the operational staff. In fact, we were told that this work has been found quite helpful, particularly so by the country economists in the Regional Departments and by the IDF and IFC staff, whereas scepticism with regard to the usefulness of this type of research prevails within the IPD staff. We strongly feel that one of the objectives identified for the Bank's Research Program - "to improve the Bank's capacity to give policy advice to its members" - has been accomplished by this project.

7. It should also be noted that researchers from LDCs have been involved in the DS project to a large extent. This has created some problems on their own, in terms of time schedules as well as diversity in contents. But it also has contributed to stimulate policy-oriented research in the countries themselves which otherwise would not have been undertaken and, more important for Bank's purpose, it has stimulated policy discussion in these countries. Argentina is one case in point. The quantification, for the first time, of effective rates of protection (taking 1969 as the base year) has influenced significantly the current thinking of the government in the direction of decreasing the high average level of protection, of narrowing the dispersion of the effective rates of protection and of

encouraging, by means of financial incentives, those industries which have, or could develop, international competitiveness. Furthermore, one of the authors of the chapter on Argentina of the DS project has recently followed up the earlier findings, taking 1977 as the year for calculating effective rates of protection. We have also found for Colombia and Israel a growing amount of research resources devoted to the empirical analysis of trade policy issues. Thus, the DS project has contributed, directly and indirectly, to promote applied research in Bank's member countries, which is also a central objective of the Research Program.

8. Studies of this type are not only worthwhile because they may assist in shaping more rational incentive policies in the countries studied. They are also important for the lessons they can provide for many other LDCs at lower stages of economic development. As one cannot take for granted, however, that these externalities will be automatically internalized by those other countries, it should be helpful to extent the regional coverage in the research on incentives. The project on Bangladesh (RPO 671-75) which is now underway, and the one on selected West African countries (RPO 670-87), which is near to completion, are a useful extention of Bank's research in this field. Other (comparative) country studies on incentive schemes could follow. From a purely academic point of view, this may involve diminishing returns, and the DPS staff is well aware of it. One may also argue that such additional studies need not be undertaken in the Bank. But yet, many LDCs still favour policies of import substitution, maintain high levels of effective protection and prefer quantitative interventions over pricing incentives. And the Bank will presumably continue lending to them. A regular analysis of the incentive policies pursued by member countries could

increase the advisory capacity of the operational offices. Moreover, if incentive schemes are to be changed in order to make development policies in LDCs more effective in the medium and long run, the Bank has the authority to explain this forcefully to national governments, whereas individual researchers of academic institutions, including those of the LDCs themselves, frequently lack this influence. This is particularly important with regard to the question of how a transition to a more efficient incentive scheme could be made in practice. The answer to this question still requires a good amount of research anyway.

9. The internal needs of the Bank relating to incentive policies do not exhaust themselves with country reviews. As a lending institution, it has also a great interest in knowing whether the economic viability of individual investment projects financed by the Bank depends on protection. It also has to possess appropriate guidelines for appraising the significance of a protection element in such projects. In this respect, the non-RPO study on "Industrial Protection in IFC Projects", assigned to a research consultant, could be useful.

10. Basically the same conceptual framework as in the DS project was used to examine empirically the relationship between levels of protection afforded to nine individual IFC projects and their economic efficiency. But it is shown that, contrary to country analyses, conventional measures of effective rates of protection only have a limited value for making decisions at the project level. The main reason is that the judgement about the economic viability of a new investment also depends on future changes of protection (and other incentives) which can be expected to take place over the life of the project. This is an important finding to be taken into account by all

Bank staff members involving in investment project appraisal. While this is recognized in the corresponding offices (including the IFC itself), we have also to admit that, from an operational point of view, both Bank's researchers and officers would face serious data problems. The DS project referred to above shows how difficult it is to obtain adequate data for making price comparisons for past periods. It might prove even more difficult to make such comparisons for a period of years in the future, as required ideally in solid investment appraisal at the project level. On the other hand, this is a good example of research, including methodological research, which, if feasible at all, can probably be undertaken only in an institution like the Bank with a reasonable chance of success. Researchers in academic institutions frequently are reluctant in embarking on large data collection activities which are regarded as not adding much to professional reputation. And they may not work hard enough on the methodology of project appraisal because they do not perceive this issue as crucial as researchers closely connected with an operational staff might do. In fact, literature on project appraisal shows that pioneering work on investment appraisal has been done by researchers within international organizations involved in this business.

11. The project on "Promotion of Non-traditional Exports" (RPO 671-10) is, by comparison, more descriptive. Its significance for policy tasks is, however, great. It is shown that economic policies of LDCs have a substantial impact on the evolution of new manufactured exports, and in this regard this project has complemented the DS one. It is an example of how Bank's research findings relating to incentive policies can be successfully diffused, among both the Bank's operational staff and local researchers as well as government officials in LDCs.

12. All things considered, we feel that Bank's research for appraising incentive policies should not be discontinued, though shifted in emphasis if required by the Bank's needs. While there may be studies which do not provide the operational staff with ready-made solutions to pressing problems, the overall research work in this field can contribute, and in fact has contributed in the past, to sensibilize the country economists in the regional offices. Particularly, this work helps them to fully understand the efficiency problem at both the macro and micro-level and to explain its implications to LDC governments. As the research in this field places high demands on the data, the Bank is an appropriate place for undertaking it, given its experience, as well as the fact that researchers from academic institutions do not have a comparable access to all information required. Furthermore, while it is always difficult to sell a research result to a government, the Bank might be - given its leverage - in a good position to induce LDC governments to draw as many benefits as possible from the flow of thinking coming from its research units. That research on incentive policies and economic integration is also undertaken by both academic research institutions and other international organizations should not be considered as an argument for not doing it at the Bank, mainly for two reasons: first, research inside and outside the Bank is complementary to a significant extent; the Bank could exploit its comparative advantage even more by doing comparative studies. Second, and more fundamentally, advances in policy-oriented research, including its methodological foundations, are normally greater, the greater competition among researchers is.

RESEARCH PROJECTS ON INDUSTRIAL DEVELOPMENT AND TRADE

(1) Incentive Policies; Economic Integration

Juergen B. Donges
Jae-Ik Kim

Project No.	Project Title	Responsibility	Date of Approval	Date of Completion	Date of Evaluation
670-01	Development Strategies in Semi-Industrial Countries	B. Balassa		July 78	
670-22	Economies of Scale and Tariff Levels	G. Pursell	Nov. 71	unknown	
670-87	Industrial Policies and Economic Integration in West Africa	B. Balassa	June 73	Dec. 78	
671-10	Promotion of non-Traditional Exports	D. Greene	June 74	Nov. 76	
671-75	International Trade Policy for the Development of Bangladesh	C. Jayarajah	March 78	Nov. 79	

Balassa, Bela, "Tariffs and Trade Policy in the Andean Common Market", Journal of Common Market Studies, December 1973, pp. 176-195.

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KIM

Evaluation of World Bank Research on Trade and Industrial Development:

- Export promotion policies in the LDCs and access to markets in the DCs -

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(1) Research and the Bank

In evolving from the lending institution initially envisioned by the Articles into a comprehensive world development organ, the World Bank has developed various research needs. As a lending institution, the Bank's main concern is project evaluation and implementation. The research needs for this function of the Bank are relatively stable and easy to fulfill, and methods and data for determining creditworthiness can best be generated by the operational staff after the underlying policy framework is determined by the political organs of the institution.

The research needs of the Bank as a development institution are more extensive and fundamental. In this capacity, the Bank has to concern itself not only with project conception, but also with the crucial task of education and training of its own staff and also officials of member governments. Unlike lending operations, development policies research has many dimensions. First of all, the Bank needs to keep abreast with external studies on the process of world development. On the most macro-level, a global economic picture has to be captured and a development philosophy promoted which is suitable and appropriate to the Bank. The Bank assists its members and the providers of loan capital in attaining their respective economic goals. Knowledge on individual countries and industries is essential for this task, which may be acquired through external or internal processes.

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Considering the diversity and magnitude of the problems that attend to world economic development and the limited resources of the Bank available for this purpose, it is essential that the Bank set clear priorities for itself on research needs.

In setting these priorities, the Bank should consider the fact that it has served its members as a catalyst for internal policy reforms. These reforms are frequently considered to be as valuable as the loan itself by the governments of developing countries.

Frequently the members of the Bank staff are regarded as expert arbitrators in a member's domestic policy conflict. Rational policies advocated by economists in the government frequently run into objections from traditional elements of the society. In order to resolve such impasses governments may request the participation of the Bank in research and consultations. How persuasive the staff are in proposing a solution will depend in large measure on their ability to distinguish the essential cause of the problem from the rest of the conditions.

(2) Research Projects on Industrial Development and Trade

Projects on industrial development and trade are grouped together under six categories, which as a whole cover a wide range of subjects that are crucial to the expansion of trade in manufactures. Government policies regarding industrial incentive systems, and economic and institutional variables for promoting export expansion seem to have been analyzed by methodologically sound projects conducted by capable investigators.

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In the case of industrial development, the research projects rightly give emphasis to promotional policies, incentive systems, programming, credit markets, and investment strategies. Cross-national, albeit selective, studies of industrial incentive systems have provided valuable knowledge that is helpful to the Bank's operational wing as well as to the borrower governments.

Given sufficient resources, it is highly desirable that the Bank take initiatives to extend the present studies to more LDCs. The target set for industrialization in the Lima Declaration by UNIDO seems to be only generally stated. What is required to meet this goal by individual LDCs is not well analyzed. In addition to economic considerations for industrial development covered by the research projects under way, study into the fundamental questions regarding industrialization such as social and political prerequisites for industrial development should be attempted on a comparative basis.

(3) Export Promotion Policies in the LDCs and Access to Markets in the DCs

The seven commissioned studies (RPOs) and five references may be grouped into four categories: (1) surveys of selected industries, data compilations, and analyses of commodity markets, (2) problems of import restrictions by the DCs on the LDC's manufactured goods, (3) national policies and institutions for trade promotion in the LDCs, and (4) syntheses dealing with the over-all environment of trade.

The last category, assuming that the project (RPO 671-56) on the marketing of Colombian clothing exports will be of similar quality to others directed by Keesing, generates useful knowledge to exporters of the manufactured goods. The study by Plesch on electronics and

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electrical machinery captures the past trend and produces generalizations which would be of value to the Bank's operational staff as well as to the potential exporters of the products. The study by Keesing on developing countries' exports of textiles and clothing is an original and thorough analysis of the industry based on primary statistical data. This study emphasize the importance of the trade intthese items for developing the export industry in the LDCs. The study also shows that the quantitative restrictions by the European Community and the United States adopted in 1977-78 will be effective through 1982, thus putting an end to the rapid growth of these exports. Having put this trade in perspective, the study proposes the possibility of reciprocal reductions of protectionist measures as one of the policy choices for the future, which seems to be an useful idea for policy makers in both the LDCs and developed countries. The thorough Keesing and Plesch's statistical analysis of global trends in the export of manufactures in developing countries also deserves notice.

Baldwin (RPO 671-67) and Waelbroeck and others (RPO 671-66) are investigating the market share of manufactured products from developing countries and the sources of protectionist pressures in industrialized countries. The European group proposes to study the role of the EEC in trade restrictions in the future. These proposals hold good promise. Although much has been written about the economic impacttof manufactured imports to developed countries, few studies so far have made any serious attempt to analyze the political impact of these imports. This sort of analysis should be very valuable, and should provide important insights into the political processes that transform these impacts into protectionist pressures and eventually into protectionist policy actions. Both studies began with identical hypotheses

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on protectionism. Protectionism and its successful reflection in government policies is believed to be a function of some dozen or so broadly defined factors, some quantifiable and others not. It is not clear from the proposals how weights will be assigned to each of these multiple factors. In the case of the American study, Baldwin measures the market penetration of some 400 items, classified on a 4-digit SITC basis for a time span of 8 to 10 years. The history of the protectionist trend and its political-economic causes will be studied. Both projects will provide useful empirical analysis of the structure of protectionism.

In view of the various trade restrictive policies being adopted by developed countries for political and social reasons, existing studies on the income elasticity of manufactured exports from developing countries will have limited practical relevance. These studies which are mainly economic analyses of the effects of protectionism on trade and employment have served their function. Yet, the fundamental causes of protectionism need to be better understood. Developing countries and various lending agencies that must predict the expected return on investment in manufacturing for exports need to tackle this problem, although it may be amorphous and intractable to traditional methodology.

Seen from the same perspective, Keesing's study of key institutions and the expansion of manufactured exports (RPO 671-68) is expected to make an equally important contribution. Its purpose is clear, its frame of investigation concrete, and its theoretical and methodological foundations sound. As any export promoter knows, marketing has been the most serious bottleneck for export expansion. Particularly for the inexperienced exporter, who usually takes low prices for granted and bases his export projections on them, a marketing bottleneck is a frustrating, and frequently invisible, roadblock. Keesing's research will therefore fill a large gap in existing information and be a valuable educational

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tool for exporters of consumer goods to the U.S. market. Sharpston's study of international sub-contracting was a thorough analysis of an important method of seeking access to markets in developed countries.

"Export Incentives in Developing Countries" (RPO 671-35), under the supervision of Balassa, evaluates the export promotion efforts of four developing countries with a comparative framework using a cross-section investigation of major export products and a time-series analysis of the effects of export promotion measures. The project is a major effort in data collection and is designed to yield practical information for other countries that contemplate the introduction of a system of incentives for export promotion or reform of the incentive system. If the project is successfully completed, the results would be relevant to the World Bank in advising developing countries on the scope and methods of export promotion.

On the other hand "Export Promotion and Preferences: A Case Study of India" (RPO 670-21) used an inadequate methodology to attain the purpose of the project. It failed to identify the system of policy measures that would be desirable and sufficient in India to enable entrepreneurs to respond to new opportunities in foreign markets.

The editor and authors of contributions to "Industrialization and Trade Policies for the 1970's (RPO 670-20) made an important contribution in documenting recent growth in manufactured exports from the LDCs and its impact on industrialized countries. Systematic and comprehensive studies of the effects of increased manufactured exports from low income countries

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on employment, social policies, and investment in the developed countries was long overdue. Without effective policy measures on adjustment assistance in developed countries, economic growth in many low-income countries will have to slow down, causing a long chain reaction. This work which contains important statistical information based on a thorough analysis of primary data has also stimulated other studies.

Balassa's recent paper, "World Trade and the International Economy: Trends, Prospects and Policies" (May 1978), is a timely study valuable to the entire development economics community. It compares trade liberalization and economic growth prior to the oil crisis with trade barriers adopted during the post-crisis recession. Recent non-tariff restrictions, government aids to industry, international cartels, and market-sharing in major developed countries are documented and their effects evaluated. Concluding that the risks of new protectionism are high, Balassa proposes policies for long-term growth, structural adjustment assistance, and an international code of good conduct. Semi-industrial developing countries were also advised to reduce existing protection, to upgrade and diversify their exports, and to gradually abandon the export of simple, unskilled-labor intensive manufactures for the benefit of countries at lower levels of development, a course of action which some developing countries in Asia have already set out to follow.

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(4) Future Research

In the past, Bank-financed research has been well respected for the quality of information on specific problems or situations. The country reports and industry surveys filled large gaps in existing knowledge which other research was not able to fill because of its distance from the scene. A continuation of this "division of labor", is still a good arrangement. In research, the Bank's comparative advantage lies in its proximity to on-going development problems. It has a unique global network of information, and Bank researchers, whether in-house or commissioned, are well received by most member governments. As in the past, the Bank should seek the active participation of LDC institutions in its research efforts, whenever the quality of work can be assured.

Judging by the project descriptions, more research can be commissioned on several new areas that so far seem to have escapted professional scrutiny. Restrictions on market access for manufactured exports from developing countries, which are expected to intensify, will increase the need for research on protectionism in industrialized countries and their adjustment policies. The same trend will encourage further research on manufactured trade between developing countries.

Research on trade between LDCs will have to be conducted with methodological schemes that are quite different from those commonly used. The historical backgrounds of institutional deficiencies, which restrict trade between the LDCs, for example, call for a broad social-science approach. In the future when such research is commissioned the following issues should be thoroughly investigated: (1) The transportation bottlenecks to trade between the LDCs, (2) the desirability of setting up an LDC preferential system, (3) special problems in marketing LDC-produced manufactured goods in developing countries, and (4) payment problems that are unique to

RESEARCH PROJECTS ON INDUSTRIAL DEVELOPMENT AND TRADE

Market Access; Export Promotion Measures

Jae-ik Kim
and Gerardo M. Bueno

Project No.	Project Title	Responsibility	Date of Approval	Date of Completion
670-20	Industrialization and Trade Policies for the 1970s	H. Hughes	June 72	Oct. 72
670-21	Export Promotion & Preferences: India	D. Wall	Mar. 72	Mar. 73
671-35	Export Incentives in Developing Countries	B. Balassa	July, 75	Dec. 79
671-56	Marketing Manufactured Exports	D. Keesing	June, 77	June, 79
671-66	Effects of Increased Imports of Manufactured Goods from Developing Countries in Western Europe	J. Waelbroeck	79	Middle of 80
671-67	Effects of Increased Imports of Manufactured Goods from Developing Countries in the United States	R. Baldwin	July, 78	Dec. 79
671-68	Key Institutions and Expansion of Manufactured Exports	D. Keesing	Jan. 78	Dec. 79

RESEARCH PROJECTS ON INDUSTRIAL DEVELOPMENT AND TRADE:

Market Access; Export Promotion Measures

Kessing, 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.

Balassa, Bela, "World Trade and the International Economy: Trends, Prospects and Policy", World Bank Staff Working Paper No. 282.

Sharpston, M., "International Subcontracting," May 1974, Bank Staff Working Paper No. 181, Published: World Development, 4, No. 4, 1976 pp. 333-337.

NELSON

Yale University
Inter-Office Correspondence

Date: October 23, 1978

To: Assar Lindbeck, Kirit Parikh, and the Panel on Research on Industrial Development and Trade

From: Richard Nelson

Subject: Evaluation of World Bank projects on capital utilization, capital labor substitution, and technological change.

I. Remarks on my interpretation of my assignment.

There are at least two different assignment lists. Therefore I am not fully sure as to the projects for which I have primary reviewing responsibility. However, because the particular assignment made sense, I have taken it upon myself to review the set of projects under the above heading: project numbers 670-23, 670-25, 670-54, 670-95, 671-51. I also am not certain as to the appropriate form of my review, recognizing its preliminary stage. It seems to me that, to facilitate discussion among the panel, a rather informal presentation is warranted. This I present below.

II. Project Review

Reading through the project proposals and the papers written under the projects enables one to trace the development of thinking at the Bank about production function related phenomena. One can see how work under one project generated insight and puzzles which influenced work under a subsequent project. The overall impression is that of a cumulative research program that is contributing significantly not only to thinking at the Bank about industrialization problems, but which is influencing thinking within the development economics community more broadly.

Three of the projects (really two because 670-25, and 670-95 are basically on the same topic) now are closed down, and have received earlier reviews. The Bank research on industrial capacity utilization (670-25 and 670-95) was path breaking and important. The objective was to assess carefully and empirically casual impressions that despite the scarcity of capital in less developed countries, capital was not being used very intensively, and if that proposition held up, to contribute to understanding of the phenomena. The endeavor posed methological, empirical, and theoretical problems: by in large they were adequately resolved. This work now is widely recognized as having made a significant contribution to understanding of patterns and problems of economic development.

The project on employment and capital labor substitution (670-54), now also completed, was more of a mixed bag. It was related to the work on capacity utilization in that this project also was concerned with examining ways in which capital could be used more frugally. The research under the project did not have the coherence of work under the capital utilization project, and by and large the output of the project has had nowhere near the impact. However, the questions considered under the project still are of prime importance to the Bank, and their exploration continues under another project, 670-23.

The two major projects currently underway at the Bank are the above mentioned 670-23, "Scope for Capital - Labor Substitution in the Mechanical Engineering Industry", and 671-51, "Appropriate Industrial Technology". The former project has been underway for much longer than the latter, more resources have been invested in it, and the output is much more impressive. The latter project is just beginning, and while it is too early to judge, it appears promising.

The research tack taken by the current project on capital labor substitution is to explore in microeconomic detail the nature of the production processes involved in particular areas of manufacturing, and to examine the range of capital - labor substitution available in each. The project has had to face methological, empirical, and theoretical questions of considerable difficulty. The struggle has been valiant, and the project has provided an analyses of production processes and the range of choice that is more detailed and more sophisticated than any other work I know probing similar questions. Other studies under the project have explored the choices of technique actually made by firms, and the market and other institutional factors which have influenced those choices (which in a number of cases have been much more capital intensive than would make sense from an economists point of view). The project appears to be having considerable impact within the Bank, and while academics tend to lag in the development of their appreciation of work of this sort, the importance of the project is beginning to be recognized by the academic development economics community.

As mentioned above, the project on Appropriate Industrial Technology is just beginning. The project has two thrusts: measuring the gains to less developed countries from adopting more appropriate technologies, and examining the capital goods sector in less developed countries as a possible major determinant of the availability of appropriate technologies. A few illustrative numbers has been put together on the first issue, and some literature review, casual empiricism, and thought have been directed at the second. The work thus far is promising but it is too early to tell how successful the endeavor will be. Projects 671-51, and 670-23 compliment and support each other. The relevance to good policy making of better understanding of choice, or (more sharply) understanding why more capital using techniques are chosen when less capital using ones are available, is obvious. The more recent reports on both projects reveal the authors growing concern about innovation, as contrasted with choice among "obvious and available" alternatives and, as mentioned above, a complimentary interest in institutional structure. I shall comment on these intellectual developments later.

I already have made comments on most of the points we are to try to assess, but let me rundown the check list. 1) What has been the contribution to knowledge - direct and indirect? Very considerable. The projects score high in this dimension. 2) Has there been an attempt to survey existing knowledge, and has the project avoided duplicating work that was already done elsewhere? Yes, on both counts. Several of the projects commissioned literature review papers early in their careers. Most of the papers written under the projects reveal, through their siting of the literature, a good awareness of what was going on. And, as remarked above, far from duplicating other work, several of the projects were path breaking and unique. 3) What has been the relevance of the work to a) bank operations b) extending knowledge of development process c) meeting needs of LDC policy makers? From what I am able to understand, the research has significantly influenced thinking at the Bank regarding how to evaluate industrial investment projects, and the institutional environments and constraints that facilitate efficient development. The projects have

contributed significantly to understanding of developmental processes. I do not know how the work has affected policy making in the less developed countries, but I would think that potentially the work could have a real impact. 4) Was any real basic research attempted? Successfully? The answer is a strong yes on both counts. 5) Has the research output been used by operating people at the Bank? This question seems to me to duplicate 3a. My understanding is that it has influenced thinking in the operating departments. 6) What type of involvement has there been by researchers in less developed countries? At least two of the projects certainly have involved researchers in research institutions in less developed countries. Two of the other projects were in effect, one person shows (by economists with a base in the U.S.). 7) What is the mix of insiders and outsiders doing research? I find it hard to pin down what "insiders" and "outsiders" might mean. I remarked above about the use under the projects of researchers from less developed countries. In the United States, both full time bank members and consultants have been used. It would appear that two projects, 670-25, and 670-54, largely involved a contract with outsiders with little direct connection with researchers at the Bank. The work under these projects seems a bit distant from the research at the Bank. In the more successful projects, bank employees or more or less full time consultants were involved importantly or dominantly. 8) How can one characterize the allocation of resources in various dimensions? As I suggested above, the projects have tended to involve a mix of methological, empirical, and theoretical research. Some of the work has been quite basic, other studies have been really quite close to operating policy issues. 9) How could the research allocation be explained? I suspect that this question was meant to apply to project areas where the allocation has been unsatisfactory. In this case, the allocation seems to me to have been quite satisfactory. 10) Any recommendations? Mainly I have applause rather than suggestions for change. However, I would like to call attention to three related topics of interest that appear to be arising in the research: industrial innovation, entrepreneurship, and the institutional structure which molds and constrains not only incentives but also information flows.

III. Where should they go from here?

The banks research under the current two projects reported above increasingly is highlighting that effective capital labor substitution, and the adoption of appropriate technology more generally, is not adequately described in terms of picking things off the shelf. At the least adaptation, and in many cases innovation is involved in effective choice of technique. Recognition of the importance of adaptation and innovation calls attention to the entrepreneurial dimension in business leadership, and to the institutional structures that encourage, support, constrain, and deter entrepreneurship.

I detect an ambivalence on the part of the Bank regarding putting their research commitments where their own research findings indicate they ought to be put. The tradition of economic research at the Bank has stressed neat, quantitative, formally specified models; there has been a reluctance to delve into areas of economic research where precise models and econometric technique can not serve as the primary tools. Issues of innovation, entrepreneurship, and institutional structure tend to be viewed as "unresearchable" or at least not amenable to rigorous research. But I propose that the logic of the Banks own past research endeavors has led it inexorably to a requirement to engage in this kind of research. And the methodological situation is not as bad as some people in the Bank may think. Over the last decade both the interest and

the rigor of research on industrial organization has increased greatly. A considerable body of good and rigorous research on the economics of technical change has evolved. However, for the most part, research in these fields has been focused on issues and phenomena in advanced countries, not developing ones. I think the Bank should accept the obvious challenge.

RRN/rg

PARIKH

A Research of Bank Research on Programming in the Manufacturing Sector

1 Introduction

The research program carried out under the heading "Programming in the Manufacturing Sector" (Ref. No. 670-24) has dealt with the problem of investment planning in industries characterised by increasing returns to scale. It focuses on improved methods for selecting investment projects from among the many alternatives in size, timing, location, technology and output mix.

A number of research reports and monographs are expected from this program. The list of reports/draft reportswhich were studied for this review are given in annex. 1.

We first summarize the major themes and important results of the research program and then comment on the quality and usefulness to LDCs and to Bank. Finally some suggestions are given for possible future directions.

2 The Nature of Research

The major themes focussed upon by the research program have been as follows:

- Importance of interdependence due to increasing returns
- Extent to which such interdependence affect project selection and planning for the development of a sector and offer scope for co-operation among the countries of a region.

These issues are explored within the context of specific investment planning problems in two sets of empirical studies, one set dealing with what is termed as "process industries" and the other with "non-process industries" (The terms are a bit confusing particularly as the models for both are described as process analysis models). Those industries characterised by a manufacturising process stream which is more or less continuous, has a limited number of processes and where the cost of carrying mid-stream intermediate products is large are termed process industries. Examples of such industries are gas transmission, fertilizer, cement, etc. These industries also have a limited number of products which are more or less uniform.

The " mechanical engineering sector on the other hand has a variety of products and processes and the same processing equipment can be used for manufacturing many different products. Such industries are termed "non-process industries".

The studies carried out for the planning of the fertilizer sector in Egypt and in East Africa have explored the choices of technology size, location, transport, product and trade. The East African study has in addition explored in quantitative terms the gains from co-operation in fertilizer sector development for the three countries of the region (Uganda, Kenya and Tanzania).

The study of the Korean Mechanical Engineering sector has explored the gains from planning simultaneously the supply of a large number of products (120 endogeneous items). The gains in the economics of domestic production are derived from selection of technique and scale of production taking into account possibilities of sharing capital equipment for a variety of products, as also, the possibilities of domestically producing on a large scale intermediate goods used in a number of products. The import or domestic production decisions are taken after considering the effects of such sector-wide interdependence.

Both these sets of st dies have used mixed integer programming models in a fixed charge formulation to account for economies of scale. Whereas the formulations of the models for the fertilizer sector are conventional and straight forward the model for the mechanical engineering sector is not easy to formulate in the conventional way. Problems of appropriate description and specification of products and processes have to be faced. This itself poses a not an insignificant problem.

However, the major problem in these studies apart from the considerable efforts and time that usually go into data collection and organisation, has been the problem of obtaining solutions of the mixed integer programming models with a large number of integer variables. A number of procedures have been developed to eliminate through simple analysis a number of integer variables which represented uneconomical choices, to reduce the size of the programming model.

3 Important Results

Apart from the specific sector development plans that emerge from these sector studies, they have also provided some insights into the nature of technology and its consequences.

(a) Significant economics of scale are present in production activities and that there is a good deal of potential

interdependence within the system as a whole.

(b) The cost of complete neglect of interdependence in choosing between production and imports in thepart of the mechanical engineering sector of Korea that was studied, increase sector-wide total supply cost by more than 3 percent of total value added for the limited number of products involved in the study.

(c) The absolute cost of neglect of interdependence is by no meanstrivial and is well above cost of conducting studies that account for interdependence.

(d) For particular products, the conventional benefit cost analysis which neglects interdependence, may give wrong results when the products are a part of a sector that exhibits interdependence.

(e) The use of programming models help in evaluating the consequences of alternative policies. The cost and or benefits of particular policies may be significant.

(f) Programming models provide a tool to estimate the benefits of regional co-operation to individual countries and help in designing ~~schemes~~ for sharing of benefits.

From a methodological point of view the most significant contribution of the research is the demonstration of the use of large mixed integer programming models.

(a) Even without obtaining globally optimum solution, programming models provide a lot of insight.

(b) Problem with a fairly large number of integer variables can be solved with reasonable costs.

(c) With a systematic exploration of break-even analysis a number of useful decision rules can be employed to eliminate significant number of integer variables.

4. Quality of Research

The research is certainly of a high calibre. Moreover, such research is hardly carried out outside the bank.

5. Usefulness

For LDCs

Large programming models and particularly economy wide programming models create an impression that the vision behind the process of development that motivates such studies is one in which an elite all knowing planning authority attain economic growth through effectively allocating resources to various sectors. Yet one need not share this vision before one considers such models to be useful. Process industries such as fertilizers, cement, etc., characterised by economies of scale and relatively a small number of plants, are the industries which are usually the

ones whose development are guided and promoted by most governments of developing countries. Starting a few large industrial projects is one of the easiest thing that governments do to promote development. The planning models developed by Bank's research has the potential to improve the rationality of government decisions in developing these sectors.

However, this potential usefulness can be realised only if adequate " extension work " follows this Bank Research. We shall return to this later.

For Bank

Clearly, the studies related to specific areas must have been carried out in collaboration with the operations staff of the Regional Department concerned. The results should have been useful in guiding Bank's lending operations, provided they were available in time. (This I would like to explore more in talks with operations staff). But clearly lot of potential is there for such work to be useful in Bank's activities.

Part of the work on the fertilizer sector plan for East Africa might have been made irrelevant by the subsequent political development in East Africa and the break up of the economic union. Even then the non-cooperation solutions could still have been useful to the policy makers in the three countries.

The Bank may have a unique comparative advantage in carrying out studies such as the fertilizer study for East Africa that identify areas for regional cooperation and which facilitate the process of realizing such cooperation. As an authority which lends money to the various countries of a region, it may have access to data and policy makers in the various countries. Moreover, as a third party its analysis may be less suspect. On the other hand Bank should also be interested in promoting such cooperation that reduces need for credit in the region.

6 Development of Research Capacity in LDC

Though country specific sector studies should involve participation of local persons, the research in this area does not seem to have involved adequate number of persons from the LDC's and it seems doubtful if even in the countries in which case studies have been carried out, there would be any capability to either update and/or improve the particular sector study or to carry out a similar study for another sector.

Creating research capability is a time consuming task and learning by doing is an essential element of development of research skills. Significant participation of researchers from the LDCs seems to be inadequate. The compulsions of time

bound research programmes, the inconvenience of communication across large distances and the convenience of access to computers and xerox machines are understandable. And yet the outcome is regrettable. An effective programme has to be designed to facilitate participation of researchers from the LDCs.

7 Suggestions for Research in Future

(a) Consequences of Interdependence for Planning

The findings of the Korean Mechanical Engineering Industry study raise a number of fundamental questions regarding appropriate policy measures for developing such non-process industries.

If economies of scale and interdependence are important the industry development ought to be centrally planned. On the other hand, effective implimentation and central planning of a sector characterised by a large number of products and processes is difficult to say the least. Moreover, the study also finds that project appraisal techniques may be inappropriate and may give evoneous results as it neglects interdependence. Yet it may be argued that the impact of neglecting interdependence on the sectors/total value added is small and could be neglected; the conventional project appraisal techniques are appropriate.

Nonetheless, the issues are sufficiently important for policy purposes that further exploration is called for.

(b) Extention

In order to bring the research results and the methodology developed to practioners, planners and policy makers in the LDCs considerable amount of "extension" work should be required.

Writing manuals accessible to technical persons, even when the mannuals are written to be accessible to non-specialists, is only a beginning. ~~Even~~ Short training courses, would also be inadequate. What would be required is a case study for a sector, which ic carried out with an active participation of a local team or better still, a local institution. It may even be desirable that the studies be carried out by a local team. Such studies may be co-ordinated by Bank staff who are familiar with such research work, and should certainly be financed by the Bank. Even when the success rate of such research is not high, it may be considered a necessary investment in building up research capability in LDCs. Such support should also include provision of computer hardware in the case of many LDCs. A sector study based on MIP models needs convenient and substantial access to fairly large computers if the study is to be completed in reasonable time.

(c) Appropriate Technology for Rural Industrial Development.

This set of studies has viewed the problems of development in a purely technical way. The objective has been to find least cost solutions. Institutional issues in the organisation of sectors, in the difficulties of implementation, or in the realm of selection of policy instruments have been beyond the scope of these studies.

And yet, with some additional effort, one could have made these studies throw some light on issues of considerable interest in LDCs. To what extent could one develop a decentralized industrial structure. What are the costs of a rural based industrial development? What is the implication for employment and income generation of development based on small scale industries? These issues need to be explored in a systematic, technical and dispassionate way. The models developed to measure the benefits of largeness should be of use to measure the costs and benefits of smallness.

In evaluating the appropriateness or otherwise of technology not only relative factor scarcities should be taken care of but also the limitations of public policy in using certain instruments. Thus if income redistribution policies are politically hard to persue, one might lay an emphasis on income generation in selecting "appropriate" techniques.

(d) Institutional issues in Implementation and Capacity Utilization

(industrial programming)

Though the Bank research in this area has been useful and has indicated benefit in excess of costs, one may still ask if there are the most important issues that need to be researched.

The problem of implementation of projects and the efficiency with which even large industrial projects are operated in many LDCs are perhaps of much greater consequence than the selection of an optimum set of projects. To what extent delays in installation of capacity and inefficient use of installed capacity in large industrial projects are due to improper organisation or due to inappropriate objectives of the management or due to inexperience and inadequate skills - need to be examined. The potential gains of being able to design effective organisational and institutional frameworks are enormous. Moreover the Bank would have a comparative advantage in carrying out research in this area as it would be able to pull together experience from a number of countries with range of characteristics.

Annex - 1

List of Reports/Draft Reports Studied

Programming in the Manufacturing Sector

1 Balassa, Bela, andStoutjesdijk, 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).

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).

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.

4 Working paper No.269

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).)

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)

7 Stoutjesdijk, Ardy, and Westphal, Larry, (eds.) Industrial Investment Analysis under Increasing Returns. (Available chapters).

DOCUMENTS

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Bank Research on Comparative Advantage, Trade Patterns and Economic Growth

I. Past and Ongoing Research

This paper describes Bank research under the general heading of "comparative advantage, trade patterns, and economic growth." While there have been a number of research projects in this general area, this paper will concentrate on three ongoing projects: (1) RPO 671-05, Patterns of Industrial Development ("Patterns"); (2) RPO 671-32, A Comparative Study of the Sources of Industrial Growth and Structural Change ("Sources I"); and (3) RPO 671-79, The Sources of Growth and Productivity Change: A Comparative Analysis ("Sources II"). Other projects will be referenced where appropriate. There is considerable overlap in this general area with the research described by Professor Balassa on trade incentives, economic integration and export promotion and the reader should also consult his paper.[1/]

The discussion below will emphasize the importance of the research projects for country economic work. A different strand of research at the Bank deals with models of trade encompassing the entire world. The relevant research projects are: (1) a completed project done by Waelbroeck and Ginsburgh to build a relatively small general equilibrium model of world trade (RPO 670-07), and (2) a new project by Waelbroeck to build a larger world trade model for the World Development Report. The country modelling work to be done for the Sources II project described below is complementary to Waelbroeck's work.

1/ Two completed research projects (RPO 670-19 and RPO 670-79) which focussed on the role of trade in particular regions (and which were based in the regional divisions) are also not discussed here. RPO 671-66 on LDC trade with Western Europe is covered by Balassa's paper.

The Patterns and Sources projects have two basic aims. The first is methodological: to test the application of existing and new analytic methods for industrial analysis within the Bank. The second is to develop a body of comparative data that can be used both to uncover commonalities in the process of industrialization and to provide a basis for analyzing the experience of individual countries. The comparative nature of the projects also provides a useful framework for what might be called "analysis by exception." Exploring why countries or sectors deviate from the norm is often a good way to test hypotheses about the nature of the normal patterns.

For Example, Korea and Taiwan have often been held up as exemplary cases of export-led growth. However, even casual comparison, let alone the more detailed analysis of the Patterns and Sources I projects, indicates that they are exceptional cases, quite different from the norm. One cannot expect that other countries can or will follow their example as part of some natural economic process. Instead, they have been much studied precisely because they are exceptional in the hope that lessons can be learned for other more typical countries.

The Patterns project seeks to provide statistically estimated structural norms at both the macroeconomic (agriculture, industry, services) and multi-sector (two-digit manufacturing) levels. The methodology follows closely that of Chenery and Syrquin in viewing a country's industrial structure as a function of its size, level of per capita income, and trade orientation. The project starts from a data base covering a large number of countries (about a hundred) over a roughly twenty-year period, and uses regression analysis to estimate common patterns.

In the Sources I project, a multi-sector input-output model is used to determine the relative contributions of domestic demand growth, export expansion, import substitution and technological change to industrial growth

and structural change. The analysis is based on detailed input-output data (20-30 sectors) for a sample of eight countries (Japan, Korea, Taiwan, Turkey, Israel, Norway, Mexico, Colombia) for a few benchmark years over roughly a twenty-year period. This sort of data is much more difficult and expensive to assemble, hence it is necessary to restrict the analysis to a smaller group of countries than in the case of the Patterns project.

In the Sources II project, the methodology of the Sources I project is being extended to explore the impact on growth and structural change at the multi-sector level of a variety of policies and factors, including growth in the supply and quality of factors of production. The project initially involves two countries (Korea and Turkey) and will also involve developing more detailed comparative data for one or two sub-sectors. A third country will be added later.

The choice of level of aggregation at which to carry out a study is critically affected by the nature of the questions being explored. Issues concerning industrial structure, such as examining the impact of trade and incentive policies, are best approached with multi-sector models. Sub-sector or project analysis is required where detailed questions of technology and institutional organization are concerned. However, it is very useful to explore similar issues at more than one level of aggregation.

For example, an integral part of the design of the Sources II project is a comparison across countries of one or two sub-sectors. The intent is to test at the sub-sector level hypotheses and assumptions that are part of the multi-sector analysis. Does the use of production functions and assumptions of profit maximization in a multi-sector model lead to results that are incompatible with an analysis of behavior at the sub-sector level? Can a careful analysis of behavior at the sub-sector level be used to improve the specifi-

cation of behavior in a multi-sector model? Is the assumed responsiveness to policy variations at the multi-sector level compatible with observed behavior at the sub-sector level?

One of the issues to be explored in the Sources II project is the role of changes in factor productivity in growth. The analysis will proceed at both the multi-sector and sub-sector levels. At the multi-sector level, it is feasible to attempt to measure increases in total factor productivity within the framework of sectoral production functions. However, the specification of production technology at the sectoral level is so aggregate that it is difficult to analyze how and why technological change takes place. For example, variations across countries or over time in measured factor productivity at the sectoral level may well be due to variations in the composition of output within the sectors. An examination both of the sub-sector composition of given sectors and of variations in factor productivity growth among sub-sectors is necessary for even an adequate description, let alone explanation, of productivity growth at the sectoral level.

While varying in focus, level of aggregation and degree of country detail, the three projects are quite complementary, both among themselves and with other research work in the Bank. They share with much of Professor Balassa's work a concern with the impact of trade policies. For example, Balassa has written on "A Stages Approach to Comparative Advantage" in which he argues that countries follow a sequence of import-substitution and export-expansion phases, with concomitant changes in their industrial structures. In the Sources I project, the issue of the existence of temporal sequences of changes in the structure of demand and production is one of the major themes of the comparative analysis. An examination of the changing role of domestic demand, export expansion, import substitution and technological change over time within given

countries reveals clear sequences of changes in the "engines of growth" both among sectors and among categories of demand. Regression analysis with the cross-country data from the Patterns project and a cross-country simulation model developed by Chenery and Syrquin as part of the Sources I project have been used to explore the emergence of "early", "middle", and "late" sectors as countries grow over time. The question of the nature and causes of such sequences will also be one of the themes to be explored in the Sources II project.

Any industrial analysis must take into account the linkages among industrial sectors. Input-output analysis provides perhaps the simplest model of how different sectors are linked through the fact that they require one another's outputs as inputs. The need to take such linkages into account, and the power of input-output analysis in doing so, has been amply demonstrated. There are, however, links other than the requirement for intermediate inputs through which indirect effects are manifested. Indeed, in market economies, the price system which equilibrates supply and demand balances across all the interrelated markets in an economy represents the most powerful mechanism by which changes are transmitted throughout the economy.

For example, effective rates of protection (ERP's) are used to measure the extent to which domestic markets are distorted by tariffs and subsidies and also to measure the sectoral resource-pull effects of such protection. Input-output coefficients are used to measure the indirect linkages among sectors. The analysis requires a number of rather strong assumptions in order to provide theoretically appropriate indicators of the effects of protection. In addition to assumptions about production technology, one must assume that the country faces fixed world prices for both its exports and imports -- that it is a "small" country -- and that for efficiency domestic prices must lie between the export and import prices. In essence,

domestically produced and imported goods must be assumed to be perfect substitutes in use. None of these assumptions is really tenable in a variety of sectors and countries. When they are not satisfied, then the determination of comparative advantage depends on the interaction of supply and demand effects across all interrelated markets, with domestic prices no longer being rigidly linked to trade.

The standard input-output model that underlies the Sources I project cannot be used to analyze the role of price variables, including the exchange rate, on the allocation of resources and on the structure of industry and trade. The Sources II project will rely on a general equilibrium model that explicitly incorporates prices (and price-responsive supply and demand functions at the sectoral level) endogenously into the model. Thus the Sources II project can explore, within its model framework, the role of policy variables such as the exchange rate, taxes, tariffs, subsidies and quotas all of which have their major impact through the workings of the price system. The fact that market-clearing prices are determined endogenously in the model allows a much more realistic specification of the mechanisms by which many policy instruments affect the economy.

There are a number of other projects in the Bank that have used, or are using, the sort of computable general equilibrium model being used in the Sources II project. The first such model was developed by Adelman and Robinson to study the determinants of the distribution of income in Korea (RPO 670-06). Since then, models in the same tradition have been built for Brazil by Lysy and Taylor (RPO 670-09) and (currently) for Malaysia by Ahluwalia and Lysy (RPO 670-94). However, the model for the Sources II project is focussed on issues of trade and industrialization rather than on issues of income distribution.

While the model underlying the Sources II project can be seen as an extension of input-output planning models, it is quite different from the input-output model underlying the Sources I project. The data requirements are significantly greater (involving, in part, the construction of an economy-wide social accounting matrix) and the explicit inclusion of price and policy variables leads to a model which requires significantly more computer software to solve.[1/]

II. Applications to Bank Operational Work

All three projects have spun off contributions to operational and policy work within the Bank. With inputs from the division, the Patterns approach has been used in Bank economic work in several countries including India and Sri Lanka. The project has also provided analysis for the past and forthcoming World Development Reports. The Sources I project has become something of a demonstration project for the use of input-output analysis. Division staff have used the approach in Bank missions to Korea and Yugoslavia. A model of Turkey which will provide the core of the comparative model in the Sources II project has been used extensively by EMENA in their analysis of Turkish development prospects over the next five years. Below, an example of how each of the three projects has been used in an operational application will be discussed.

Patterns Project

A recent application of the methodology of the Patterns project was made by Fred Moore (of IDF) for Sri Lanka, working with a country economist from the South Asia region. They used the data base developed for the project

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1/ See also the project on Social Accounting Matrices (RPO 671-27) under the direction of Graham Pyatt and Montek Ahluwalia, both of the DRC.

both to estimate norms they felt were appropriate and to compare the industrial structure of Sri Lanka with those norms. Although they looked at the norm equations that had been estimated as part of the project, they were also able to access the data set directly and, in fact, decided to estimate their own norm equations.

The analysis of the comparative data from the Patterns project permitted a first "rough cut" at determining the distinctive features of Sri Lanka's industrial structure and how it had changed over time. Given the paucity of data for Sri Lanka, it is impossible to do a detailed analysis of Sri Lanka's industrial structure and how it had changed over time. Given the paucity of data for Sri Lanka, it is impossible to do a detailed analysis of industrial structure, relating it to past policy regimes. However, a relatively aggregated comparative analysis does provide a starting point for relating changes in the structure of the economy to past development strategies. While clearly not sufficient for a thorough understanding of the industrial sector, such an analysis does provide a framework for analyzing other scattered data. It also has the major advantage that it can be done quickly and cheaply now that the comparative data are easily accessible.

Sources I Project

In 1977, Y. Kubo and K. Jordan (both of the industry division) worked with the Yugoslav country economists on a basic mission for Yugoslavia. Their first task was to evaluate and complete the necessary input-output data base and then use it to explore the consistency of the Yugoslav plan. In this task, they used the basic input-output model to determine whether the targetted gross outputs and final demands by sectors were consistent given the intermediate goods requirements.

Their second task was to explore the feasibility of the plan, rather than its consistency. The question was not whether the plan targets "added up", but whether they were reasonable given past Yugoslav performance. In this task, they used the "decomposition of growth" analysis developed as part of the Sources I project to determine the past relative contributions to total growth of domestic demand expansion, export expansion, import substitution and change in input-output coefficients. One of their findings was that the planned extent of import substitution appeared much too ambitious, both in aggregate and in individual sectors. In general, while the plan seemed to be internally consistent, their analysis raised a number of questions as to its feasibility.1/

In judging the "reasonableness" of the plan, comparisons were made of the plan projections with Yugoslav performance in the past. It would also have been very useful to be able to compare Yugoslav actual and planned performance with that in other countries, such as the eight countries in the Sources I project. However, at the time the work was done the comparative data were not available.

Sources II Project

In the past year, K. Dervis and S. Robinson (both of the industry division) have been working on an economy-wide, general equilibrium model of Turkey. The development of such a model of Turkey was discussed with the Region as part of the division's contribution to a plan-review mission to Turkey. In fact, the mission was postponed and the analysis has been used to date in work by the region on: (1) the CPP (Country Program Paper), (2) the program loan application for Turkey, and (3) the joint Bank - IMF negotiations

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1/ The results of the analysis are described in the grey-cover mission report, "Yugoslavia: Self-Management Socialism and the Challenges of Development," Report Number 1615a-YU. The relevant parts are Part III, chapters II, IV, V, and VII and Appendix VIII.

with Turkey. The plan-review mission is currently expected to go to Turkey early next year.

The major issue facing Turkey is the impact of the current foreign-exchange crisis on future growth. A number of important policy questions arise. Should Turkey devalue? By how much? What will be the impact on future growth of not devaluing? By how much and in which sectors can they expand exports? What will be the impact on growth of severe import rationing? How will different policy regimes affect the structure of industry? The analysis focused on these issues, using the general equilibrium model as a framework.[1/]

While important, the model exercise was not the only component of the analysis. For example, work was done on the relationship between imports and growth in Turkey over the last twenty years based on data developed for the Sources I project, as well as on the model analysis. As noted above, the data bases developed for both the Patterns and Sources projects are extremely useful for this sort of analysis.

Applications: Conclusions

Experience with these projects yields some lessons on how to disseminate the results of research so that they can be made useful to Bank operations. First, foremost and most obvious, both the region and the researchers must allocate adequate time to the process. In all three of the examples discussed above, the region formally allocated time for country economists to work with members of the division. Second, a particular methodology must be adapted so that it meets the needs of the region. In the Sri Lanka application of the Patterns methodology, new regression equations were estimated. In the Turkey application, the new model had to

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1/ The results of the analysis are described in a paper by Dervis and Robinson, "The Foreign Exchange Gap, Growth and Industrial Strategy in Turkey: 1973-1983".

be integrated with the software from an earlier model so that the region could have the results in a standard format.[1/] The need for such adaptation is virtually inevitable and the research should be designed to make the process as simple as possible. For example, the data for the Patterns project have been collected into a data bank that is well documented and accessible to any user.[2/] The comparative data from the Sources I project are also being collected in a common format and a software package is available that can be used to manipulate the data quickly and easily.

The fundamental operational justification for these research projects is to develop methodologies that can be used beyond the boundaries of the particular projects and to provide a body of comparative data against which individual country experience can be measured. Repeated applications should not require new research projects, but should evolve as part of the operational support activities arising from the project. For example, the input-output methodology used in the Sources I project was applied to Yugoslavia, which is not one of the countries in the project when the research project was only about half completed. Eventually, the methodology should become part of the standard analytical apparatus of operation work.

III. Future Research

The first priority for the current fiscal year is to complete the Patterns and Sources I projects, both of which are in their final stages. The Sources II project will start up gradually, finally requiring a level of Bank staff involvement comparable to the Patterns and Sources I projects together.

1/ The earlier model, called the Revised Minimum Standard Model (RMSM) is an accounting based model developed in the Economic Analysis and Projections Department.

2/ The data bank is described in a paper by N. Poduval, "Data Bank and Data Management Programs for Analyzing Patterns of Industrial Development."

The Sources II project represents the division's first work in the general area of total factor productivity. To start with, the work will be descriptive both to develop in-house expertise on the theoretical issues surrounding the measurement of total factor productivity and to gain experience in its application. It will very likely prove to be an important area for future research, both at the multi-sector and sub-sector levels.

It is difficult to foretell at this point what should be the mix of levels and issues for analysis in research projects in the future. If the analysis of productivity change and its contribution to growth becomes an important focus, the balance of work will probably shift away from macroeconomic analysis and towards sub-sector work. The integration of multi-sector and sub-sector work may well prove to be a major area of emphasis. The application of multi-sector models such as the input-output model underlying the Sources I project will probably move out of the research phase and become part of the division's work for operational support activities. Operational spinoffs from the Sources II project such as the Turkey model will require more time and resources since the methodology is both newer and more complex.

OFFICE MEMORANDUM

TO: Mr. David L. Gordon, Chairman
Industry and Trade Steering Group

DATE: October 27, 1978

FROM: Barend A. de Vries Barend de Vries/HRR

SUBJECT: Meeting on Employment and Industrial Development: Issues Institutions, Small Scale Industry and Interaction with Large (October 23, 1978)

1. The meeting discussed the attached papers by Messrs. Anderson and de Vries reviewing the status of the ongoing Small Enterprise Study, some other features of the SME sector work and certain ideas about new topics in SME research.

2. The discussion of the Small Enterprise Study brought out several important features:

(a) The Study is complex and comprehensive, and it will require a great deal of work to synthetize its findings and apply them operationally. It was suggested that a series of in-depth working sessions would help the researchers in focussing their work; this might be done in one or more general sessions, and sessions specifically dealing with the three countries where the Study is conducting SME surveys (Colombia, India and the Philippines), with participation of the Regions, CPS and DPS.

(b) The Study should arrive at an assessment of the impact of alternative policies on the development of small in relation to large industries. Subsequently, more detailed research might be undertaken on the costs and benefits of alternative policies; future surveys (of the type now being conducted) might be designed with this in mind.

(c) The Study should also cover SMEs outside the manufacturing sector.

(d) It was hoped that the Study would bring out the dynamic aspects of the growth of individual industries, e.g., certain classes of small enterprise, though large sources of employment at one point in time, may decline in importance over time; in other cases changes in market conditions or developments in technology might greatly alter their competitiveness.

(e) A study of small enterprise development could usefully cover the implications of certain infrastructure programs for demand of products of SMEs (materials and equipment for education and government buildings were cited as examples). (It was suggested that this aspect might best be studied under the Bank's project loans.)

3. The discussion endorsed several topics for future research:

(a) Cross-country analysis of transaction costs, lending procedures, bank charges and interest rate policies (see D. Anderson's note).

(b) Cross-country evaluation of effectiveness of institutional arrangements in support of SME development. This would cover both technical

and technological assistance, as well as training, operational assistance, etc., (see both notes).

(c) Further industry-focussed research: what can be learned from available literature and experience about the growth path of individual industries; scale requirements and economies; the impact of different market sizes, technological development and development stage of the country on the industry, and vice versa.

Attachments

Cleared by: Messrs. Gordon and Anderson

Dsitribution: Industry and Trade Steering Group

BAdV:vrr

DRAFT (For Meeting of Industry and Trade Research Steering Group)

TO: Industry and Trade Research Steering Group DATE: October 23, 1978

FROM: Dennis Anderson, DEDER

SUBJECT: Small-Scale Enterprise Study

The attached table provides a country by country summary of the various studies that are being financed by the project, and the approximate completion dates. I believe everyone is now familiar with how we have organized the work--a review of the literature; a comparative analysis of the historical patterns of output, earnings and employment in small and large enterprises in several countries; supplemented by what Ian Little called "boreholes" (enterprise surveys) in selected countries.

In addition, we have established links with other research institutions. The most promising is one that Mariluz Cortes has established with a Venezuelan team, who are to do a study (out of their own finances) parallel to the one that she is doing in Colombia.

Results Expected

Most of the relevant policies have been discussed estensively, and also recently endorsed in a Bank Policy and an Issues paper. It is unlikely that we shall say anything new in general terms, regarding, for example, the importance of cost reflecting interest rates; tariffs; export promotion; incentives for subcontracting; infrastructure; and technical assistance and credit. Briefly, it is my hope that three useful things will emerge from the research.

(1) We can reduce some of the uncertainties behind the policies by providing a fuller description than we have had before about how small enterprises function, their role in providing employment and earnings opportunities at various levels of a country's development, and some of the transformations that take place with urbanization, market growth and changes in factor prices.

(2) We should emerge with more reliable criterion for identifying and appraising small enterprise projects. Most projects (including those initiated in developing countries) have an "employment creation" objective, and are justified in terms of their apparently low cost per "job created." For a number of reasons we need a new criterion based on the expected capacity of these programs to raise earnings and output levels of the low income ("target") groups.

(3) We should also be beginning to emerge with a better understanding of the "demand" for supporting services and credit, and also of some of the barriers to widening the credit operations of development and commercial banks towards small enterprises. (Development and commercial banking is growing very fast in most countries; but the percentage of lending to activities employing most of the labor outside agriculture is extremely small.)

Possible Future Proposals

(1) I believe we need to initiate a cross-country study of transaction costs, lending procedures, bank service charges and interest rate policies. Some countries have introduced fairly innovative credit lines and an evaluation of them would be desirable in the interests of improving our understanding of the problems of widening access to institutional credit.

(2) Similarly, a cross-country evaluation of technical assistance and other programs would seem desirable.

(3) On completion of the present phase of our research, surveys into more industries are required, again to improve our understanding of some of the transformations that take place within the manufacturing sector. (Our present surveys are naturally covering only a limited range ofindustries at the five digit level--see table.)

Distribution: Messrs. Balassa, Fuchs, Gulhati, Moore, Richardson, Waide and Westphal

cc: Mr. David L. Gordon
Mr. B. de Vries
Mr. B. B. King
Mr. E. Stoutjesdijk
Mr. M. W. Leiserson
Mr. D. Mazumdar
Ms. M. Cortes

TABLE

Summary of Studies Being Undertaken
as Part of RPO on Small Enterprise Development

Country/Subject	Expected Completion Date
Korea and Taiwan	
"Desk study." Examines changes over time of outputs, employment, labor intensities and efficiencies of small, medium and large enterprises; urban-rural contrasts; demand linkages	Preliminary draft available.
Japan	
Historical study of role of small enterprise in Japan's economy; links to agricultural and industrial development; analysis of institutional framework and policies adopted.	Preliminary draft available.
Colombia	
(1) Study of SSE development over time and between regions; birth and death rates of small enterprises; labor intensities of large and small; regional and urban-rural contrasts.	Preliminary draft available.
(2) Survey of SSEs in the mechanical engineering sector (agricultural implements, pumps and compressors, cookers and ovens). This part of the survey is now done, and is to be extended in the next six months to include surveys in textiles, and various food processing activities (milk and dairy and bakeries).	July 1979.
India	
(1) Case study of role of SSEs in the Indian economy, with special emphasis on regional differences. An in-depth study of the textile industry.	July 1979.
(2) Survey of four industries in Delhi-Western U.P. Machine tools, shoes, printing, soap.	July 1979.

Country/Subject	Expected Completion Date
India	
(3) Survey of 3-4 industries in Eastern U.P. Probably metal products, cotton weaving and one or two of the following: bakery products, wood products, machine tools.	September 1979.
Philippines	
(1) Study of SSE development over time and between regions, in relation to industrialization and agricultural policies persued. Survey to establish enterprise birth, growth and failure rates.	March 1979.
(2) Evaluation of credit and technical assistance programs, supplemented by interviews with 100 enterprises and with the branch level staff of commercial and development banks.	March 1979.
Nigeria	
"Desk reviews" of quality of existing information on SSEs. Study is to examine patterns of output and employment and other characteristics of SSEs in Kano district. (The only area for which detailed information are available.)	November 78.
Africa	
Desk review of literature and information on SSEs in various countries (Egypt, Kenya, Sierra Leone, Nigeria, Ghana and others).	January 1979.
Other Studies in Progress	
(1) Review of Literature.	July 1979.
(2) Methods of estimating costs and benefits of SSE projects involving credit and technical assistance.	September 1979.
(3) Collaboration with other research institutions in Venezuela; possible extension of SSE research in Philippines as part of the technical assistance component of an Urban Development Project; small survey of rural industries in Mexico, as part of supervision of PIDER II project (collaboration with CPS).	Undetermined.

EMPLOYMENT AND INDUSTRIAL DEVELOPMENT:
ISSUES, INSTITUTIONS, SMALL SCALE INDUSTRY AND INTERACTION WITH LARGE

1. Ongoing Research. New research initiatives in this area will have to await identification of major gaps in the ongoing Little-Anderson SSE research project. (Mr. Anderson will report on the status of this project.) I would expect that more systematic work will be needed on the efficiency of SSE, although the project will generate some data and analysis on this topic. This note deals with major issues concerning the employment effects of industrialization confronted by industrial sector work and on which new research not included in current research projects is needed.

2. Balance Between Small and Large Industry. Industrial sector work now benefits from an increasing amount of data on SME economics (firm size distribution by industry, labor intensity, capital efficiency, etc.), but it has no comparative framework within which to judge whether a country has gone too far or done too little in small industry or, conversely, in capital intensive large scale industry. As a proxy we try to test the adequacy and effectiveness of SME policies and institutions in order to judge whether enough is being done for industrial employment creation. We analyze capital-favoring biases in industrial and trade policies, as well as the viability of specific large scale industrial investments in order to judge whether a country is leaning too heavily toward the latter. These types of analyses should usefully be supplemented by more systematic work on what constitutes a proper balance between large and small scale industry, and what policy instruments are effective in strengthening the linkages between these two. Research on industrial development patterns (cross-country analysis allowing for different size, orientation and stage of development) throws light on "norms" for industrial output, investment, composition and trade in manufactures. This research, however, was not designed to give guidance on what is a proper balance between light and heavy industries and among industries in which large or small firms dominate.

3. In this context research should also be undertaken on the indirect employment benefits of capital intensive industrial projects, the way their design can be adopted toward increasing the employment elasticity and, more broadly, the way in which these projects have fitted into countries' industrial and employment strategies.

4. Technology. Our research on technology -- substitution of labor for capital -- has been focussed mainly on choice in a few specific industries, viz., mechanical and textiles. The research on textiles has an operational orientation, but it is too early to say what in fact will be its practical impact.

5. In small industry (SSI) we face a broader question, namely, what difference, if any, would better information on technological choices make in investment design. We are interested in this question because we want to make

sure (a) that SSI entrepreneurs have adequate assistance (including information) in making sensible investment decisions and running their plant and (b) that "indigenous" and low-capital technology gets a reasonable chance. Ultimately, we are interested in seeing that the involvement of intermediaries (our borrowers) in SSI extends to technological/technical assistance and makes use of this assistance in its own sub-project appraisal process.

6. IDFD earlier made a research proposal which would have tested the effectiveness of technological assistance and of the local and external institutions delivering it. The Research Committee asked for a revision of the proposal, pending further elaboration making the methodology more precise. We are now considering some preliminary survey work in the Philippines, and possibly in other countries, before defining what more research is called for. The Colombia survey under the Little-Anderson project also has a technological component which should throw light on this issue. In my view, this continues to be an important area for considering new research.

7. Effectiveness of SSI Institutions. The institutional set up for technological/technical assistance is a part of a broader network of institutions, dealing with loan and equity financing, management, industrial extension, worker training, etc. The Bank makes use of these institutions in extending its assistance to SSEs. Since we are now gaining experience on SSE financing in several countries (but still have a long way to go toward our objective), we should benefit from an assessment of the effectiveness of these institutions in promoting sound SSE development. This type of research, in the view of many, should not be hamstrung by a rigid quantitative methodology.

Barend A. de Vries
September 29, 1978

Division of Public and Private Finance
Outline of Divisional Work Program

V.V Raoth

I. General Thrust of Work Program

The major areas of the Division's work relate to: (a) the Fiscal Structure, and (b) Financial Structure and Capital Markets. The Fiscal Structure - revenue and debt structures and expenditure and investment patterns - affects the behaviour pattern of households and enterprises and thus has a considerable impact on the functioning of product, factor and financial markets. The financial Structure and Capital Markets have a direct impact on the mobilisation, allocation and use of real resources. Both the Fiscal and Financial Structures condition not only the patterns of saving, investment and output, but also have an impact on income and wealth distribution.

Since fiscal-financial structure and policies have a pervasive impact on the pace and pattern of development, and since these constitute two major policy instruments, research and policy-oriented studies in these areas have direct relevance for the regional and operational departments of the World Bank (particularly with regard to their policy dialogue with the LDCs) as well as the policy makers in the LDCs.

II. Research

A. Fiscal Structure

There are two specific research projects relating to the fiscal structure: Public Expenditures Study (RPO 670-96) and the Public Enterprises Study (RPO 671-71). The first relates to the distributional impact of public expenditures in Malaysia; this study is largely completed

and is currently being edited for publication as a monograph. Several research papers based on the data specially collected for this study are under preparation.

The second study relates to the Management and Organisational Structures of Public Sector Manufacturing Enterprises. For a variety of objectives, governments in the LDCs have entered the field of industry. The efficiency of these enterprises in relation to the explicit or implicit objectives would depend on their managerial and organizational structures and the policy environment in which they operate. The broad purpose of this study is to identify the nature and characteristics of the structures and policy environment that are consistent with the efficiency and growth of such enterprises. The pilot phase of the study - to be completed by June 1980 - concentrates on public enterprises in India, Yugoslavia, Egypt and Italy. The second phase of the project would be undertaken in FY81.

B. Financial Structure and Capital Markets

In this area, there are five inter-related research projects: Capital Market Imperfections and Economic Development (RPO 671-69), Commercial Bank Behaviour (RPO 671-25), Informal Credit Markets (RPO 671-65), Impact of Social Security Institutions on Resource Mobilization and Allocation (ECDPF85) and Financial Structure and Technology Policy (ECDPF93).

The Capital Market Imperfections Study seeks to relate market imperfections to real resource costs of lending and borrowing. These transactions costs are the crucial variable which accounts for the fragmentation and segmentation of the LDC capital markets. The broad

purpose is to identify the nature and the characteristics of financial innovations and policy interventions that reduce these costs and thus lower the costs of lending and borrowing and narrow the interest rate differentials. Such progressive integration of the capital markets would remove the bias of the financial structure against the traditional sector and the sector of small enterprise and thus have favourable saving, investment, output and distribution effects. The exploratory phase of this project is likely to be completed by June 1979 and the second phase by June 1981.

Three dominating parts of the capital markets in the LDCs are: (a) Commercial Banks, (b) Informal Credit Markets and (c) Social Security Institutions. Their impact on the mobilization and allocation of resources and on the integration of capital markets generally is the theme of these research projects. All of them are likely to be completed by September 1979. The second phase of the Informal Credit Markets Project will be completed by June 1981.

The Financial Structure and Technology Policy Project emphasises the link between technical assistance - to promote creative adaptation of modern technology - and reduction of costs of lending and borrowing and seeks to evaluate the impact of Technical Consultancy Services and the Multi-Service Agencies set up by the financial institutions on the promotion of small-medium enterprises in India. This experiment is unique and has relevance for the other LDCs. This project is likely to be completed by June 1980.

C. Research Preparation (RES 02)

Two projects are being formulated in the area of Fiscal

Structure and Policies: (a) Impact of Government Purchase Policy on Promotion of Small Enterprises and Indigenous Technology; and (b) Rural Resource Mobilization. Government purchase policy in several countries - both developed and developing - is deliberately used as a policy instrument for promoting small enterprises and indigenous technology. The broad purpose is to evaluate its effectiveness and to find out under what circumstances it has 'promotional' effects and under what circumstances it has 'protective' and other effects. The other project - Rural Resource Mobilization - seeks to concentrate on the relationship between rural socio-economic institutions and resource mobilization for rural development. The preparatory work is likely to be completed by June 1979 and after that if they appear to be promising, they would be undertaken during FY80 and FY81.

III. Operational Support

There are three types of missions in which the Division participates: (a) Technical Assistance - Advisory; (b) those related to Research; and (c) such missions for which there is a pressing demand from the regions. The missions to Kenya (FY78) and one mission to Indonesia (FY78) relate to (a), while missions to Ivory Coast and Pakistan relate to category (b). (One related to the Capital Market Study and the other to preparatory work on Rural Resource Mobilization.) Missions to Mauritius, Indonesia (second), and Jamaica relate to category (c). Mali mission was a special mission to do preparatory work for subsequent detailed health sector study, relating to Basic Needs Strategy.

We would prefer missions in the (a) and (b) categories; (a) enables us to apply our tentative research results and insights to specific contexts, while (b) helps directly in our research. But it would not be possible to say "no" to some pressing demands by the regions. We are unable to meet even half the demands for this type of mission. However, the category (c) missions are also useful in getting some insights for research and in understanding the specificity of some structural characteristics of the fiscal-financial context.

IV. Participation in WDR II

The Division is also engaged in preparing a background paper as part of the World Development Report II exercise. The Division's study is addressed to the developmental problems of the 25 major mineral-exporting countries. More specifically, it draws attention to the short- and medium-term problems that often beset mineral economies: lagging non-mineral exports and poor export diversification performance, low growth in agricultural production and rising food imports, high rates of inflation, extreme dualism, etc. It offers policy recommendations for meeting these problems and for the long-term development strategies of mineral economies. Work on this study commenced in mid-July 1978 and will be completed by mid-November 1978.

V. Comments

The Division has made it a practice of discussing preliminary research ideas with the IDF, IFC, OED and EDI, and IMF (Central Banking and Fiscal Affairs Departments). It is only after such discussion that

specific research projects are identified. Even after the formulation, the projects are discussed with these departments. The paper on Research Program and Its Rationale was widely distributed for comments, which have been very constructive. Thus, the relevance of the research undertaken is ensured long before the projects are undertaken.

ATTACHMENT I

Operational Support

Man-Weeks - October 1, 1977 to September 30, 1978

	Country	Type of Mission	Field Work-Date	Staff Members	Man-Weeks	Research Ass't.	Man-Weeks
1.	Kenya	Technical Assistance	March 1978	Bhatt/Nankani	20	Saito	15
2.	Indonesia	Technical Assistance	March/April 1978	Kee	10		
3.	Ivory Coast	Financial Mission	July/August 1978	Dellalfar	20		
4.	Pakistan	Special Mission	July/August 1978	Ysuf	10		
5.	Indonesia	Basic Economic Mission	Oct./Nov. 1977	Kee	20		
6.	Jamaica	Econmic Updating	Jan/Feb. 1978	Yusuf	12		
7.	Thailand	Bank Economic Mission	November 1977	Meerman	15		
8.	Mauritius	Special Eco. Mission	Jul/Aug. 1978	Kee	12		
9.	Mali	Special		Nankani	10		
	Total				129		15

ATTACHMENT 2

RESOURCE ALLOCATION

MAN-WEEKS (FY79 AND FY80)

		FY79			FY80		
I. RPO		Staff	Consultants	R/A	Staff	Consultants	R/A
(a)	670-96 (Public Expenditures)	15	18	-	-	18	-
(b)	671-71 (Public Enterprises)	40	60	11	36	60	11
(c)	671-69 (Capital Market Imperfections)	40	16	15	42	20	24
(d)	671-25 (Commercial Bank Behaviour)	9	20	4	-	-	-
(e)	671-65 (Informal Credit Markets)	4	36	4	10	40	4
(f)	671-59 (Small Enterprise Study)	-	-	16	-	-	-
RES02	(a) Rural Resource Mobilization	15	-	-	34	25	11
	(b) Government Purchase Policy	8	-	-	25	25	-
	Sub-total	131	150	50	137	188	50
II.	In-house Studies						
(a)	Social Security Institutions (ECDPF85)	4	12	12	-	-	-
(b)	Financial Structure and Technology Policy (ECDPF93)	12	70	-	10	50	10
	Sub-total	16	82	12	10	50	10
III.	Operational Support	125	-	14	125	-	15
IV.	WDR II/Special Tasks	16	-	10	16	-	10
V.	Miscellaneous (Seminars and CSW)	21	-	6	21	-	6
	Total	309	232	92	309	238	91
	MAA	21			21		
	Total						

OFFICE MEMORANDUM

TO: Mr. Hollis B. Chenery

DATE. December 13, 1977.

FROM: Bela Balassa

SUBJECT: Research Requirements in Industry and Trade

1. In response to your memo of November 10th, Messrs. Balassa, de Vries, Keesing, Laursen, Moore, Walstedt, Weigel, and Westphal met to discuss future research requirements in industry and trade. There was general agreement that the resources presently available for research in these areas are inadequate for the Bank's needs. At the same time, the participants at the meeting agreed that first priority should be given to ensuring the practical application and dissemination of research results. There is further need to extend research in areas presently under study, so as to establish a "critical mass", and to undertake research and establish a capability at the Bank for continuing work on manufactured products. This would require, even excluding research on additional worthwhile subjects, a simultaneous increase in manpower and in research funds.

2. The need for practical applications and dissemination is particularly apparent in regard to the highly successful research project on Programming in the Manufacturing Sector. It is of further importance to ensure that research on development strategies finds operational application in country work.

3. Among research areas in industry, the research project underway on small-scale industries would require a follow-up as well as practical applications. Topics of interest in this area include the efficiency of small-scale industry, subcontracting, and the choice of technology. The latter subject is of more general interest, transcending the scope of small-scale industry, and a research program on the subject is being developed. This would cover, among other things, the availability of labor-intensive techniques and the motivation on the choice of techniques.

4. Several research areas bridge the fields of industry and trade. In conjunction with the need to establish a capability for continuing work on manufactured products, it is proposed to examine prospective changes in industrial location as between developed and developing countries in regard to intermediate products and engineering industries.

5. Among intermediate products, steel, petrochemicals, paper and fertilizers offer particular interest; in some instances this would build on existing Bank work. In the case of these products, existing information on new investments should be consolidated, together with demand projections, in a model framework so as to indicate efficient locational patterns and to serve as a guide for Bank investments and policy advising. In the case of engineering industries, the international division of the production process through the trade of parts, components, and accessories offers special interest.

6. Changes in industrial location are influenced by the policies followed in the developing countries and by market constraints in developed countries. As to the former, studies on the experience of semi-industrial countries would need to be complemented by work on manufacturing growth in non-industrial countries and in natural resource-rich countries.

7. Market constraints in developed countries would need to be examined on an industry-by-industry basis in the United States, Western Europe and Japan. In this connection, attention would need to be given to the extent of market penetration, the "danger points" that may trigger protectionist pressures, and the replacement in the markets of developed countries of other developed country suppliers by developing country exporters. In the case of Japan, resistance to market penetration by developing countries and these countries taking over Japanese markets of textiles offer particular interest.

8. Another research area worth exploring is intra-LDC trade. This could be defined after the completion of Mr. Laursen's paper on the subject. The economic effects of national self-sufficiency in foodgrains could also be usefully examined, together with possible alternatives, including regional self-sufficiency and participation in international trade. A further topic of interest for the New International Economic Order in general, and the UNCTAD commodity schemes in particular, is the structure of marketing and the resulting distribution of the gains from trade among producers, traders, and consumers, in selected primary commodities.

9. These are some other research areas relating to industry that may be worth pursuing. They include the financing of industrial development, including the growth of financial intermediaries; the financing and insurance of the exports of machinery and equipment; the operation of public enterprises; and second-best shadow pricing rules for industrial investment.

10. A memorandum on "Topics for Industrial Research", written by Mr. Moore is enclosed. This memorandum complements the medium-term draft program on trade and commodities that was distributed on December 7th.

cc: Messrs. Qureshi, Fuchs, Gordon, de Vries, Hyde, Moore,
Keesing, Laursen, Walstedt, Westphal, Weigel
DPS Directors, Trade Steering Group

Enclosure
BBalassa:nc

OFFICE MEMORANDUM

TO: See Distribution DATE: December 5, 1977

FROM: Frederick T. Moore

JECT: Topics for Industry Research

At the meeting this morning I agreed to write down the list of topics for research in industry that I had. These topics are of concern in operational work and most of them could be undertaken in the form of case studies.

1. Small Scale Industries: There are a number of sub-topics here, but a key question that needs to be addressed is: Are SSI efficient users of capital and labor, and if so, in what industries? So far the Bank's programs have accepted that SSE are efficient users as an act of faith. There is little hard evidence to back this up.

2. Programming Models in Industry. This work got off slowly and has had real success in the Egypt fertilizer model, the SE Asia and India models. The work in this area is in immediate danger of being terminated. 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 imperative or we lose momentum.

3. Studies of the engineering industries (or call them capital goods or machinery). These industries are critical for industrial development because of several characteristics; 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; and, there are definite export possibilities. Case studies are needed.

4. Financial institutions and industrial growth: The Bank has a long history of lending to financial intermediaries. A fresh look is needed at the relationship between the growth of these institutions and industries growth requirements. What kinds of specialization are called for? When? What are the conditions precedent and the conditions for success? What incentives and policies will stimulate the right kind of development? How should the future Bank programs be aimed? Included here are problems of establishing capital markets and venture capital types of institutions.

5. World location of industrial capacity: The Bank should take a hard look at the targets of the Lima Conference on the location of capacity of key industries in LDC's. Will it happen automatically? Will it be efficient? What are the gains and losses in trade and in market control? What are appropriate Bank responses?

6. Public sector behavior and performance: Much of industrial lending goes to public sector corporations. We need to know much more about

their relative efficiency, whether they are really implementing multiple objectives, what measures should be applied to them, etc. Case studies plus other studies on decision-making in these circumstances are required.

Finally, there is another research project, that does not fit neatly into the industrial framework, but is nonetheless important:

7. Short-cut methods of shadow pricing and second-best applications in industrial projects. This is one I hope to formulate as a research project (with D. Schydlowsky) and present to the committee. It is a follow-on to the project started by B. Balassa.

I suggest, in the write up, there be a separate section on trade and on industry.

Distribution:

Messrs. Balassa, B. King, de Vries, Weigel, Westphal, Keesing, Walstedt, Laursen.
Messrs. Gordon, Chanmugam, Hyde

FTM:adh

LEWestphal
11/22/78

Bank Research on Industrial Technology[1/]

The nature of industrial technology has been of central concern to Bank research in several areas:

- sub-sector investment analysis, with particular reference to the process industries (e.g., fertilizer);
- industrial organization, with emphasis on the role of small and medium enterprises;
- industrial capacity utilization; and,
- capital-labor substitution, with greatest attention to the non-process industries, specifically mechanical engineering.

Research in the first two areas is discussed in separate notes, and will here be mentioned only in passing. In turn, research on technological change is anticipated in the future, so that priorities in this area are also discussed below, in the concluding section.

Capacity Utilization

Contrary to what might be expected given relative capital and labor scarcities, rates of industrial capacity utilization appear typically to be lower in developing countries than in the industrially advanced countries. This observation has led to the suggestion that it might be possible to secure increased output and employment in many developing countries without additional investment, simply by increasing capacity utilization. The reasons for low utilization and means to increase it have been explored in two Bank projects -- "Utilization of Industrial Capacity

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1/ Draft for the Industry and Trade Research Steering Group.

in Five Latin American Countries" (RPO 670-25) and "Industrial Capacity Utilization" (RPO 670-95).

The quality of readily available data on industrial capacity utilization in most developing countries is quite poor. An important contribution of these projects has been to develop quite simple yet meaningful indicators of capacity utilization, and very carefully to estimate rates of utilization for a number of countries, making possible cross-country comparative analysis. Thse data indicate that utilization rates in the countries surveyed are indeed quite low, that they differ among countries and industries, and that at least a part of the variation across industries can be explained on the basis of technological characteristics.

As to the reasons for low utilization, the research indicates that a variety of policies across a number of fields (e.g., licensing of various forms, restrictive labor legislation) have played an important role in some countries. However, at least some of the research casts considerable doubt on the expectation that greatly increased capacity utilization could be achieved through changes in these policies alone. Here a variety of micro-economic cum institutional constraints are cited, including factors such as the shortage of skilled labor, inadequate provision of transportation and other social infrastructure for workers not on the first shift, individual preferences regarding work scheduling, and the understandable reluctance of small scale entrepreneurs to delegate operational management of their firms.

As regards their operational relevance, these projects were intended to have a general impact, to increase awareness of issues concerning capacity utilization, to provide empirical estimates as well as illustrative case studies of explanatory factors, and to reach policy conclusions at the specific country level as well as more generally. The potential impact has yet to be realized, and awaits the preparation of an integrated survey to distill the principal results of the various pieces of research conducted under these projects. Without such a survey, operational economists lack convenient access to empirically documented approaches to policy-focused analysis of industrial capacity utilization.[1/]

Mechanical Engineering

Bank research centered on mechanical engineering began with the project "Programming in the Manufacturing Sector" (RPO 670-24). The aim of this project was to test means of incorporating interdependence among industrial activities into formal project identification and selection methods. For completeness of coverage, case studies were carried out for both a process and a non-process industry; these were respectively fertilizer and mechanical engineering.

The single most important difference between the process and non-process industries is found in the nature of the processing facilities used in production. Corresponding to the prevalence of multi-purpose processing facilities in the former but not in the latter industries, economies of specialization — as distinct from economies of scale using unchanged

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1/ A synthesizing monograph is forthcoming from the "Industrial Capacity Utilization" project, but it will remain to reconcile the results of this project with those of its companion.

production methods -- play an important role only in the non-process industries.[1/] Economies of specialization, in turn, lead to importtant interdependencies among the choices of processing facilities across a potentially vast number of products.

This form of interdependence makes the choice of production technology to produce any individual product dependent not only upon the volume of demand for the specific product but also upon the volumes of demand for a large number of related products which may share processing facilities with the product in question. However, given the volumes of demand, appropriate degrees of specialization across processing facilities can -- to a first approximation -- be determined on the basis of engineering judgment. Initial research into investment analysis for mechanical engineering activities under the "Programming..." project exploited this fact. With respect to each of a set of interdependent products, and given forecasted demand levels for the final products within the set, an analytical model was designed that focuses on the decision whether to produce locally or to purchase from external sources. The model is not explicitly concerned with determining appropriate degrees of specialization; this determination takes place through the estimation of the model's parameters by engineers.

In short, the model is intended to provide an initial comparative advantage ranking of possible import substituting production activities prior to the detailed design of specific products. Engineers and industry specialists familiar with the model's experimental application to Korea appear to find that it provides useful quantitative information that facilities the

1/ In the process industries, processing facilities are typically single-purpose and product specific, usually at the plant level. In contrast, where single-purpose processing facilities are found in the non-process industries, it is generally at the machine or shop level. Multi-purpose processing facilities in the mechanical engineering sector range from individual machines such as drill presses through integrated facilities such as foundries.

incorporation of two types of interdependence into project identification work. The first results from the use of common components and sub-assemblies; the second from the sharing of multi-purpose processing facilities. Both underlying phenomena are extremely important, for they determine the extent to which economies of scale may be exploited through increasing the utilization of indivisible processing facilities.

Capital-Labor Substitution in Mechanical Engineering

The desire explicitly to incorporate economies of specialization into investment analysis for a non-process industry was one of the factors that prompted the project "The Scope for Capital-Labor Substitution in the Mechanical Engineering Industry" (RPO 670-23). However, the primary concern was to estimate the degree of capital-labor substitution feasible in typical mechanical engineering activities, to permit careful forecasting of the response of employment to possible changes in the economic environment, for example, changes in relative factor prices. In this respect, the project represented a case study aimed at the growing concern with means to enhance employment generation.[1/] Additional justification was found in the importance of the mechanical engineering industry to industrial development, particularly as a "carrier" of technological change.

This research has involved translating engineering data regarding individual tasks into a format that permits economic analysis of choice of technology. It has led to the conclusion that the scope for capital-labor substitution is quite wide at low levels of output, but that it narrows markedly at higher volumes of production owing to eocnomies of specialization which strongly

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1/ Bank research on employment generation through industrial development and on the scope for capital-labor substitution in industry began with the project "Employment and Capital-Labor Substitution" (RPO 670-54). This exploratory project solicited a number of individual studies by eminent consultants, but for a variety of reasons it did not lead anywhere. It is thus not further discussed in this note.

favor capital intensive techniques. Moreover, the results underscore the critical importance of efficiently organizing production among processing facilities so as to achieve the proper balance between capacity sharing in multi-purpose facilities and specialized production using single-purpose facilities.

The research carried out under this project suggests a methodology whereby economies of specialization may be incorporated into investment analysis, but it remains to articulate the details of the approach. Its promise appears greatest where the number of possible investments is limited and substantial gains can be achieved by exploiting possibilities for sharing expensive and specialized processing facilities among different activities involving disparate end products. In such cases, the methodology would greatly facilitate identification of the most advantageous possibilities for sharing expensive equipment; identification would be at a level of analysis meaningful to project design engineers.

Through the IFC, staff working on this research became familiar with the effort by Mexico's Nacional Financiera to promote the production of plant equipment. The project identification task confronting Nacional Financiera happens exactly to fit the circumstances under which the methodology's promise appears greatest, so that a proposal simultaneously to articulate and apply the approach was made. A final decision has yet to be made, but it appears that lack of financing will lead to rejection of this proposal. However, the proposal's chances of acceptance would obviously have been greater were the methodology already fully articulated.

Appropriate Industrial Technology

The project "Scope for Capital-Labor Substitution..." also investigated differences between indigenously produced and imported machinery as seen from the perspective of using industries in a developing country. While falling within the genre of "choice of technology" case studies, this part of the project had the explicit purpose to investigate why existing machinery producers in developing countries have been unable to capture a larger share of the market for many types of

machinery. The resulting case study was thus directly addressed to understanding the behavior of producers in choosing among technologies, as opposed simply to analyzing the implications of the physical embodiment of technologies in processing facilities.

The focus was on the choice of textile weaving equipment in Korea, where the "curiosity" to be explained was the choice by many textile producers of imported looms costing two-to-three times as much as the locally produced equipment. Broadly speaking, the explanation could be found in one or several of four reasons: different varieties of cloth require different types of looms; Korean looms embody a generally inefficient technology; government policies (e.g., that result in higher interest rates to finance the purchase of indigenous looms) discriminate against the use of indigenous looms; and, Korean textile producers do not choose among technologies to maximize profits. The research found that the labor intensive technology embodied in locally produced looms was generally more appropriate on economic grounds than the capital intensive technologies embodied in the more highly automated, imported looms.[1/] The explanation for the choice of imported looms was typically found in government incentives that favored their selection.

The case study just discussed complements a large number of similar studies undertaken outside the Bank over the past several years. To bring the conclusions of the entire body of recent "choice of technology" research into the Bank's thinking, a survey was commissioned under the "Appropriate Industrial Technology" (RPO 671-51) project. The objective of this survey is, in the first instance, to attempt a rough impressionistic estimate of the macro-economic consequences of choosing inappropriate versus appropriate technologies, in order to

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1/ A similar research project in the IFC, investigating choices made by some of its client firms, also concludes that there is wide scope for capital-labor substitution in textiles production.

establish the relative importance of technological choice as a determinant of industrial development performance with respect to employment generation.

The survey demonstrates that choice among technologies is possible in many industrial activities without sacrificing efficiency, and moreover that alternative choices can have a pronounced impact on the employment (and output) generated by a given volume of investment. Different profit rates are also associated with alternative choices of technology, with more labor intensive technologies yielding higher profits at lower wages. But, choice of technology is obviously not the only determinant of profit rates; the efficiency with which a particular technology is utilized is of equal importance. The question that arises in this connection is whether entrepreneurs find it as profitable to search for more appropriate technologies as to achieve greater efficiency with a technology that may not be profit maximizing at full efficiency. This is not a moot issue, as costs are entailed to search for alternative technologies, just as effort must be expended to improve efficiency.

The second objective of the survey is thus to consider possible means of facilitating entrepreneurial selection of economically appropriate technologies The means selected for rather intensive review is the promotion of capital goods production by the developing countries, which appears to offer several advantages. First, several case studies reported in the literature find that locally produced equipment embodies a more appropriate technology than does imported equipment — the case of Korean looms is not unique in this respect. Second, developing countries can produce some types of equipment more cheaply than can developed countries, particularly the types of equipment likely to be used by small and medium scale enterprises. Third, marketing of such equipment, both domestically and through export, lowers the cost of access to alternative technologies. In turn, promotion of capital goods production in developing countries is an activity in which the Bank could become directly involved through its lending.

A separate, second phase of the "Appropriate Industrial Technology" project (given a separate RPO number, 671-77) has resulted from involvement of the researchers in reviewing the choice of technology for a Bank-financed textile project. At issue was the adequacy of the assessment that led to the selection of a more highly automated technology than had been found eocnomically appropriate for similar production in Korea, but in this case for a project to be located in a country far less industrially developed than Korea. This phase of the research has as its objectives, first, to amass the body of data needed to assess technological choices within textiles production, and second, to undertake an assessment for a hypothetical project similar in nature to that reviewed initially. Particularly important is that this phase, unlike the first (and equally, unlike most previous "choice of technology" case studies), is to be carried out jointly by operationally oriented engineers and research minded economists. Previous studies by the latter have typically not proved convincing to the former; it is hoped that a joint effort may resolve some of the issues that remain outstanding.

Relevance of Past and On-going Research

It is evident that the research on industrial technology surveyed above is micro economic and empirical. This orientation is also found in the other research not surveyed here, and equally in the more recent work on trade and industrial strategy. There is no substitute for micro empirical research to achieve soundly based policy prescriptions if an appreciation of technological factors, particularly as they interact with institutional elements, is required. A case in point is the research on industrial capacity utilization: a clear understanding of the significant constraints to achieving much higher utilization came only as a result of such research. The design of practically oriented methods of investment analysis also requires firm grounding in micro empirical research.

Micro empirical research focused on policy assessment and advising at the country level has obvious relevance, but needs to be disseminated effectively. In turn, as in the case of work under the "Appropriate Industrial Technology" project, micro empirical research may also be oriented toward the Bank's own policies and procedures. This work, like that on investment analysis in mechanical engineering, is in its infancy as regards its dissemination to and assimilation by decision-makers and operational staff. To the degree that such work is focused on project identification and design, it should eventually affect decision making at the project level. But first it will be necessary to gain multi-disciplinary acceptance, which will doubtless require that the researchers become more actively involved in operational project focused work.

It is also evident that much of the research has involved the case study approach, where generalizability is a serious issue. However, there is often no viable alternative. A case in point is the research on economies of specializatio in mechanical engineering: economies of specialization can be understood only with respect to specific cases. Lags in dissemination have unfortunately retarded the vetting process that is required to probe the generalizability of case study research regarding mechanical engineering.

The case studies undertaken to date have not been isolated pieces of research. Firstly, they have been designed to be responsive to important issues in the Bank's industrial lending. There is nonetheless much work yet to be done to demonstrate their relevance to operational staff. Secondly, subsequent case studies have built on the foundations laid by their predecessors. In this respect the research staff have achieved a distinct comparative advantage in certain areas, for example, choice of technology and mechanical engineering.

Future Research

No further research is planned on industrial capacity utilization, through further effort with regard to dissemination is needed. In turn, a great deal more further work is required to capitalize on research involving mechanical engineering. Apart from making the results of this research accessible, two tasks are deserving of priority. First is the detailed articulation of the methodology for incorporating economies of specialization -- equivalently, capital-labor substitution -- into investment analysis and testing cum demonstration of the methodology. Second is the use of what has been learned about the organization of production to address issues regarding the role of small and medium scale versus large scale enterprises.1/

The identification of priorities for further research in the general area of choice of technology awaits more complete discussion of the results from the first phase of the "Appropriate Industrial Technology" project. These results suggest that further work may be warranted to investigate:

- the influence on technology selection and project design of consulting engineers having different backgrounds;
- the prospects for increasing the production of capital goods in developing countries, with special attention to trade in machinery among developing countries;
- the diffusion of industrial knowledge, with empahsis on institution building possibilities; and,
- the use of used equipment, and possibilities for increasing trade in used equipment.

1/ The research suggests that a high degree of specialization is required to achieve efficiency at small scale. But, factors not involving production technology -- such as costs of distribution and forces leading to product differentiation -- weaken this argument and need equally to be taken into account.

Complementary work is already underway with respect to the last two of these areas under the aegis of research on small and medium sclae enterprises. Surveys undertaken for this research examine the sources of technological information as well as the use of used equipment among firms in several countries.

Finally, in part as a result of the recent emergence of new style projects aimed to build up the capacity for indigenous technological change, operational staff have recently argued that priority should be given to research centered on technological change. Research staff have also been drawn to this conclusion, as a result of finding that there is no sharp line dividing technological change from other processes that improve industrial performance.

Among the possible foci for research in this area, two are under active discussion. The first would seek to complement research sponsored under IDB/ECLA auspices that has documented the purvasiveness of technological change in several Latin American countreis. This research needs to be supplemented with similar investigations of technological change in countries following more outward-looking industrialization strategies, to determine the influence of industrialization strategy on the extent, pace, and direction of technological change. In this connection, exports of technology by the semi-industrial countries may be particularly deserving of attention, for it would equally cast light on an important means of technology transfer among developing countries. In turn, further work on the mechanical engineering industry, specifically to assess its role in the process of technological change as the supplier of capital goods, also appears warranted, and would profit from the Bank's previous research on mechanical engineering.

Finally discussion of priorities for future research must also consider staffing constraints. Present staff resources are stretched thinly across perhaps too many areas, with evident implications for dissemination as well as for startin_

work in new areas. Without additional resources, shifts in the direction of research will either be slow in coming or take place at the expense of realizing the full relevance of past research.

Bank Research on Incentives and Domestic Resource Costs; Economic Integration in Developing Countries; and Export Promotion and Market Access

Bela Balassa

I. Incentives and Domestic Resource Costs

Past and Ongoing Research

Bank research on incentives began with the "The Structure of Protection in Developing Countries" research project in 1967. The research project, the findings of which were published in book form in 1971, provided an evaluation of the system of protection applied in developing countries. This was done by estimating effective rates of protection for Brazil, Chile, Mexico, Malaysia, and Pakistan, and analysing the economic cost of protection in these countries. Estimates were also reported for a developed country, Norway.

For greater comparability, subsequent work concentrated on semi-industrial countries. Furthermore, the scope of the investigation was extended to cover -- in addition to protective measures -- credit and tax incentives, and to estimate effective rates of subsidy that incorporate all these incentive measures. This was done in the "Development Strategies in Semi-Industrial Countries" research project (RPO 670-01) that also analyzed relative incentives provided to exports and to import substitution in countries following different development strategies, including Argentina, Colombia, Israel, Korea, Singapore, and Taiwan. The findings of the research project were incorporated in a volume that is under consideration by the Bank's Publication Committee.

In the framework of the "Industrial Policies and Economic Integration in Western Africa" research project (RPO 671-87), indicators of incentives as well as of domestic resource costs have been estimated for Ghana, Ivory Coast, Mali, and Senegal, so as to compare the incentives received by particular economic activities and their social profitability. In regard to agriculture, estimates have been made for various commodities produced in several regions and by the use of alternative techniques. Within the manufacturing sector, indicators of incentives and resource costs have been estimated on a firm-by-firm basis while earlier studies relied on input-output tables.

Draft versions of the individual studies are available and have been communicated to the individual governments. A summary paper "Comparative Advantage and Economic Integration in Western Africa" has also been prepared, examining the implications of the results for the extra-area and the intra-area trade of the West African countries.

Applications

An early summary of the findings of "The Structure of Protection in Developing Countries," with emphasis on the policy implications of the results, was circulated in the Bank as EC-175, "Industrial Protection in Developing Countries" in 1970. The discussion of the findings contributed to the increased emphasis given in country economic reports and policy analyses to the cost of protection in countries oriented towards import substitution and to the need for outward orientation. It also led to several in-house estimates of effective protection, including Nicaragua and Iran.

The circulation of working papers derived from the "Development Strategies in Semi-Industrial Countries" research project (in particular, "Reforming the System of Incentives in Developing Countries" and "Export Incentives and Export Performance in Developing Countries") and seminars based thereon have also contributed to an increased outward orientation of Bank work. Furthermore, the study on Argentina appears to have influenced the policy adopted in the mid-seventies and it has led to a new application of the methodology commissioned by the Argentine government. With the prominent positions assumed by their authors (Research Director of the Bank of Israel; Vice-President of the Korean Development Institute; Economic Adviser to the Prime Minister of Singapore; and Minister without Portfolio and Deputy Governor of the Bank of China, respectively), the studies on Israel, Korea, Singapore, and Taiwan, too, have affected economic policy-making in the countries concerned. Finally, advisory reports prepared for the governments of several developing countries and published in a volume under the title "Policy Reform in Developing Countries" have influenced the policies adopted by some of the countries concerned.

The Senegal study of the Western Africa research project has led to the preparation of a tariff and tax reform, to which the author of the study has made a substantial contribution. The reform of the incentive system was also in preparation in the Ivory Coast but it has aborted as a result of political changes. Finally, the recommendations made in the Mali study have led to an investment project financed by the Bank.

The methodology of the Western Africa research project has been applied in the Bank to agriculture as well as to industry. The Agricultural Projects Department sponsored a comparative investigation of

agricultural pricing, "Price Intervention in Agriculture" (RPO 671-39), which has entailed estimating indicators of incentives and domestic resource costs. The methodology has also been utilized in industrial sector studies of Cameroon and Nigeria, the former in the framework of an industrial mission and the latter in the form of a special mission financed by the Nigerian government. Finally, a study of domestic resource costs in agricultural and industrial activities in Bangladesh, "International Trade Policy for the Development of Bangladesh" (RPO 671-75) is under way.

Future Work

There are requests for the application of the effective protection/subsidy-domestic resource cost methodology on the part of several Regional Offices. DPS resources available for country applications of the methodology are severely limited, however, and the situation is similar in the Regional Offices. Resources to carry out such studies may be made available by increasing staff in the DPS, CPS, or the Regional Offices; alternatively, funds for hiring consultants may be provided in the research budget and/or in the budgets of the Regional Offices.

Particular interest attaches to applying the effective protection/subsidy-domestic resource cost methodology in non-industrial countries, and resource-rich countries, where little research has been done so far. Such studies may be part of an investigation of alternative stategies for industrialization in these countries. A study of Tanzania, for example, would permit examining the implications of a basic needs-oriented approach to international trade.

Country applications of the effective protection/subsidy-domestic resource cost methodology may be made in semi-industrial and industrializing countries as the need arises. The Bank should also monitor the trade policies followed

by these countries and offer policy advice. However, further research on countries that have established an industrial base would bring diminishing returns. Possible exceptions are research on recent policy changes and on an efficient import substitution-export promotion sequence.

A paper is planned on policy reactions to external shocks, such as the oil crisis, the 1973-74 recession, food shortages, world inflation, and the "new protectionism" in selected developing countries. In turn, research on the import substitution-export promotion sequence would require the development of an appropriate methodology.

II. Economic Integration in Developing Countries

Past and Ongoing Research

Reference has been made above to the paper "Comparative Advantage and Economic Integration in Western Africa" that summarized the preliminary findings of the research project on Western Africa (RPO 671-35). The paper has also dealt with the obstacles to economic integration in the region and made recommendations for alleviating these obstacles. An earlier paper "Types of Economic Integration" compared integration efforts in developing countries with those in developed and in socialist countries. In turn, "Economic Integration among Developing Countries" examined past experience with integration via trade liberalization and the so-called project approach, with recommendations made for the future. An analysis of the costs and benefits of the project approach is provided in the Fertilia Study on East Africa, carried out in the framework of the "Programming in the Manufacturing Sector" (RPO 670-24) research project. Finally, a report on the past experience and future prospects of regional integration in the Caribbean under the title "Commonwealth Caribbean: The Integration Experience."

Applications

The Bank has not played an important role in promoting regional integration in developing countries. It has financed, however, several regional infrastructure projects as well as an industrial project, the CIMAO plant in Togo that will sell cement in the Ghana and the Ivory Coast as well. Also, a study was prepared on regional specialization in fertilizer for ASEAN and assistance was provided on a similar study, the Andean Common Market.

Furthermore, apart from the report on economic integration in the Caribbean referred to earlier, an industrial sector report examined economic integration in Central America. Finally, two advisory reports "Tariffs and Trade Policy in the Andean Common Market" and "Guidelines for the Common External Tariff of the Andean Common Market" were prepared with the purpose of aiding the establishment of the common external tariff in the Andean Common Market.

Future Work

Economic integration among developing countries presents important policy issues for the Bank. Topics of interest include experience with past integration schemes, in particular as far as agreements on industrial specialization are concerned; future possibilities for regional integration by the use of tariff preferences and through industrial specialization agreements; and the benefits and costs of inter-regional trade among developing countries in the framework of preferential trade agreements for collective self-reliance.

Among these topics, a paper is under preparation on intra-industry specialization in developing countries. It is also planned to examine how

specialization agreements can be oriented towards ensuring international competitiveness. It would further be desirable to undertake work on the experience of complementarity agreements in LAFTA and of specialization agreements in the Andean Common Market.

III. Export Promotion and Market Access

Past and Ongoing Research

Issues related to exports arise on the supply side as well as on the demand side. On the side of supply, incentives and institutional factors will affect exports. In the framework of RPO 671-10, "Promotion of Non-traditional Exports" the experience of a number of countries with export promotion was analyzed. Work on Argentina, Brazil, Colombia, and Mexico was carried out under the auspices of ECLA while papers on India, Israel, Korea, and Yugoslavia were prepared by Bank staff-members and consultants. The paper on India also draws on work done in RPO 670-21 "Export Promotion and Preferences: India."

The research project on "Export Incentives in Developing Countries" (RPO 671-35) utilizes the effective protection/subsidy-domestic resource cost methodology to analyze the incentives granted to, and the social profitability of, exports on the firm level in Greece, Korea, Pakistan; work on Brazil has not started yet. Apart from incentives, the research project considers the institutional aspects of export promotion, including marketing.

RPO 671-56, "Marketing Manufactured Exports" concentrates on the role of marketing in the development of textile exports from Colombia. In turn, the "Key Institutions and Expansion of Manufactured Exports" research project (RPO 671-68) examines the role of marketing effects of national firms, trading companies, foreign buyers, and multinational corporations in regard to

manufactured exports from developing countries, and considers the institutional implications of promoting these exports.

As regards factors affecting demand for the manufactured exports of the developing countries, RPO 670-20 "Industrialization and Trade Policies for the 1970s" focused on adjustment policies in the developed nations. For several years, this project was not followed up by further research. It has since been concluded, however, that the Bank has a role to play in this area, in part to help Bank operations in manufacturing and in part to provide assistance in policy advisory work.

The emergence of new protectionism in developed countries was discussed in "World Trade and the International Economy: Trends, Prospects, and Policies." Also, a paper is being prepared on the employment effects of trade in manufactured goods between developed and developing countries, with separate consideration given to different skill levels.

A systematic analysis of market penetration by developing country exports, the factors determining protectionist actions in the developed countries, and the experience of selected industries where protectionist measures have been taken is carried out in a series of research projects utilizing a common methodology. They include RPO 671-67, "Effects of Increased Import of Manufactured Goods from Developing Countries" in the United States, the manufacturing export part of RPO 671-66 on Western Europe, and RPO 671-82, covering Australia, Canada, and Japan.

Applications

Increased demand for policy-related work in the trade area has emerged in recent years, reflecting interest among policy makers in both the developed and developing countries, and an increasing role of the Bank in policy analysis. Several papers on trade trends and issues, drawing to a considerable extent on research done in the area, were prepared as background for World Development Report 1978, and additional papers on these issues are being prepared as background for next year's report.

Work on trade in electronics and electrical machinery, textiles and clothing, and non-electrical machinery carried out by the Development Economics Department represents a mixture of original research and applications. This work has been well received but its continuation and extension into other industries such as footwear is threatened by staff limitations, caused partly by expanded demand for policy work.

Future Work

Bank work on policy issues is likely to lead to demand for further research in this area. This demand is in part met by monitoring protectionist actions taken by developed countries. Further interest attaches to evaluating the impact of newly imposed protectionist measures in developed countries on the export industries of the developing countries. Finally, the studies of institutional and marketing aspects of export promotion, which now focus mainly on consumer goods sold in developed country markets, may be extended to capital goods industries.

The continuation of work on trade in electronics and electrical machinery, textiles and clothing, and non-electrical machinery is of consider-

able importance to developing countries, and may be followed by studies on auch product groups as footwear and transport equipment. Given the rapidly increasing share of these commodities in the exports of developing countries, this work should be put on a regular basis by providing the necessary staff resources.

Among intermediate products, steel, fertilizer, and petrochemicals offer possibilities for exportation and for import substitution in the developing countries and are subject to Bank lending. In the case of steel and fertilizer, work presently carried out in different departments would need to be coordinated. Given its importance for developing countries, it would further be desirable to undertake work on petrochemicals on a continuous basis, involving projections of supply, demand, as well as prices. More generally, further extension of commodity work to processed primary products would be desirable.

Moreover, it would be desirable to provide for the updating of information collected in the research projects on market penetration once they will have been completed. The updating of information on marketing channels would also be useful, possibly in the framework of the industry studies referred to above.

Mr. Alan Gelb

REVISED DRAFT
AStoutjesdijk:crs
Nov. 27, 1978

PROGRAMMING IN THE MANUFACTURING SECTOR[1/]

RPO 670-24

Introduction

This note is a brief synopsis of history, objectives, achievements, failures, and issues for the future, relating to research project RPO 670-24, Programming in the Manufacturing Sector. Given the need for brevity, this note cannot do full justice to any of the above aspects. The main purpose is not to provide the full background for an ex post evaluation, but to convey a sense for the potential of this line of work in and outside the Bank, and to generate a discussion on where to go from here.

Background

The project was begun in late 1970, initially exclusively by consultants, by the (then) Basic Research Center, as an independent component of the Center's work program focused on the importance of interdependence in economic analysis. Specifically, the project was to address the question of interdependence within the industrial sector, taking the existence of economies of scale explicitly into account.

At the time the research was begun, several contributions to the literature had established that, in principle, techniques could be designed that enabled the analyst to incorporate the phenomenon of economies of scale into sectoral investment analysis. These contributions demonstrated that the technique of mixed-integer programming could be employed successfully

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1/ This review has benefitted from comments and suggestions made by members of the Trade and Industry Steering Group.

to quantify the impact of economies of scale on the design of an investment program.[1/] However, the case-studies mostly focused on highly aggregated industrial activities, placed in the context of greatly simplified representations of reality, and were not designed to yield operationally useful results. Even then, they demonstrated that the computational complexity of the available techniques of analysis were enormous: one model took 40 hours of computer time to solve. In light of that experience, it seemed highly unlikely that much further work was soon going to be undertaken in this area in a university environment. This was unfortunate, as these early attempts showed that, at last, an approach had been developed that could lead to the formalization of project identification and sectoral investment analysis in the presence of economies of scale. Under those circumstances, it was felt that a major research effort under World Bank auspices was justified.

Objectives

Initially, the main objective of the research program was to assess the feasibility of quantifying the impact of interdependence, including the effect of economies of scale, in the context of an operationally meaningful specification of an investment problem. As the work progressed, however, and feasibility was clearly demonstrated for various industrial sectors, the

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1/ Mixed-integer programming is a variant of the technique of linear programming, differing from the latter only in the sense that some of the variables must assume integer values, usually zero or one. The integer variables are associated with the investment costs in such a manner that if a plant is built, the corresponding integer variable is forced to assume the value one, thereby activating a fixed charge on plant construction, and to zero if a plant is not built and consequently no investment cost should be incurred.

objective became more ambitious, namely the development of a formal approach to sectoral investment analysis in the industrial sector, taking economies of scale into account, and leading to the design of project-specific investment programs in selected industrual sectors.

A Short History of Progress To Date

The research program started with three studies, following distinct lines of investigation. First, Thomas Vietorisz, in a study of the Mexican heavy electrical equipment industries, investigated the investment problem at the plant level. Second, Larry Westphal, later joined by Yung Rhee, focused their attention on the Korean mechanical engineering industries, and analyzed for 120 carefully selected products within that subsector whether Korea had a comparative cost advantage for domestic production. Third, Charles Frank and Ardy Stoutjesdijk, later joined by Alex Meeraus, formulated a model of the East African fertilizer industry, analyzing future investment possibilities in a multi-product, dynamic and spatially disaggregated framework which, moreover, permitted substitution among final products.

This early effort demonstrated three points. First, some industrial activities lend themselves better to comprehensive investment analysis than others, depending on the degree of homogeneity of products and the complexity of the relevant production technology.[1/] Second, the computational problem introduced by economies of scale was quite complex and available solution procedures were far from efficient; without extensive "pre-analysis" of the

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1/ The usual distinction here is between process and non-process industries, where process industries can be defined as those characterized by predominantly single-purpose equipment, and high degree of homogeneity of products used and produced.

investment problem, the models were essentially not solvable at reasonable cost. Third, significant progress in this area was dependent upon a research environment that accommodated an interdisciplinary approach, combining the skills of the economist, the engineer and the computer scientist in an integrated fashion.

The subsequent research effort was influenced by these lessons. Considerable attention was paid throughout to the development of shortcuts, designed to reduce the complexity of the problem, and to the design of more efficient solution procedures and methods of problem specification. An attempt to develop an original solution procedure for this general class of models, by Glen Martin of Control Data, New York, for the Bank, was a failure. However, it led to an internal research project (GAMS, RPO 671-58), under Alex Meeraus' supervision, which is likely to result in substantial software developments.

The realization that some industries require a much greater effort in model development and specification than others led to the formulation of a new research project focused on investment analysis in the so-called non-process industries, i.e., industries that are characterized by multi-purpose equipment and consequent capacity sharing, as well as significant heterogeity of inputs and outputs. Specifically, this project extends the work done on the Korean mechanical engineering industry (M.E. II, RPO 670-23), paying much more detailed attention to the scope for capital-labor substitution at the product and process level. Details of this project, which is still in the research phase, are given in a note by Larry Westphal.[1/]

1/ "Bank Research on Industrial Technoloby", Nov. 22, 1978.

Case Studies

A number of case studies were undertaken, following the original three research efforts, that mainly focused on process industries. Given the familiarity acquired with the fertilizer industry--an essential condition for the specification of a useful model to analyze investments--it seemed natural to test the applicability of the approach in different types of environment in this subsector first. In that vein, case-studies were carried out in Egypt (in collaboration with the Bank's Industrial Projects Department and Egyptian counterparts), ASEAN (at the request of the Consultative Council for Food Production and Investment), Andean Pact (in collaboration with the Andean Pact Secretariat and Inter-American Development Bank), and India (with Industrial Projects Department); in addition, a world-wide model of the fertilizer industry was formulated at the request of IFC, and the results incorporated in a paper presented to the Board.

At the same time that considerable experience was gained with the method in case studies of fertilizer production, the program was expanded in a number of directions. Models were formulated for use in the analysis of investment in the forest industry sector. The first case-study was done in Turkey; following successful application of the models in that context, the approach was used in FAO's World Pulp and Paper Program, and specifically applied to the countries in the ASEAN region. In the process, the methodology was transferred to FAO, where it is now routinely used within the Program.

Encouraged by the feasibility of carrying out country-specific sub-sectoral studies, a research project was designed that was to take the methodology several steps forward, and provide the analytic framework for

the so-called package approach to integration project analysis. This approach, which was described in a joint article with Bela Balassa[1/], involves the simultaneous analysis of a number of industrial subsectors in the context of a regional investment agreement among several countries. In this case, West Africa was selected as the environment for the study, which was to focus on steel, fertilizers, pulp and paper, as well as cement. This project was too ambitious. First of all, it became quite clear at an early stage that further model development was required to capture intersectoral linkages, and to introduce multi-sector, multi-country budget constraints. Second, the data requirements of the study were not likely to be met unless large investments in data collection were made; neither the Bank nor the countries were likely to do so. Consequently, this project was abandoned at an early stage; no empirical work was carried out in West Africa with the exception of some analysis of the CIMAO clinker project in Togo, at the request of the Industrial Projects Department.

For specific industries, the methodology turned out to be fairly flexible in its application, and in a number of cases the research team was able to respond positively to specific requests. The number of requests for assistance has accelerated in recent years, and at various points in

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1/ Bela Balassa and Ardy Stoutjesdijk, "Economic Integration Among Developing Countries", World Bank Reprint Series: 39.

time, the researchers were involved in a model of clinker production (in Brazil), petrochemicals (Portugal and Mexico), energy (Nigeria), steel and mechanical engineering (Mexico), and chemicals (Turkey). A recent request from Korea concerns assistance in the formulation of investment programs in fertilizers, pulp and paper, and basic metals. Moreover, the method has been successfully applied to world-wide planning of the copper industry and the aluminum sector.

Practical Results

The full application of the methodology developed in this project permits the formulation of investment programs for sets of interdependent industrial activities, taking aspects such as time, location, sizing, technology and product mix explicitly into account. As such, it provides a formal analytic approach to project identification.

One of the major strengths of the method is that it permits a rapid quantification of the impact of alternative project and program designs, and therefore gives the project planner and the decision-maker a much greater insight into the nature of the planning problem and the scope for choice. Moreover, the consistency framework implicit in the model often leads to results that appear at first surprising to the project planner, but, on second thought, are clearly plausible.

The models constitute tools of analysis that contribute insight and quantified information to a decision-process that involves many different inputs. As such, they are aids to decision-making, not black boxes that are

designed to replace it. Thus the practical result that is sought is better informed sectoral investment decision-making, for which the models have been shown to provide highly useful inputs. It is in this vein that the dissemination effort, described below, has been conducted.

Dissemination

Various routes have been taken to disseminate the methodology. The main academic output of the project will be a volume, edited jointly by Ardy Stoutjesdijk and Larry Westphal, entitled Industrial Investment Analysis under Increasing Returns; the volume is currently in the hands of the Bank's Editorial Sub-committee. In addition, a large number of internal reports and several Bank Staff Working Papers have been produced. To disseminate the research results to a more practically oriented audience, a series of manuals is being produced, under the editorship of Alex Meeraus and Ardy Stoutjesdijk. In addition to a volume that provides a comprehensive and self-contained introduction to the methodology of process analysis models, and a User's Guide that presents guidelines on data representation and computer-related aspects, the series contains several sector-specific volumes (fertilizers, pulp and paper, and steel) as well as a volume that demonstrates the use of the method in a common market context. The latter volumes contain case-studies that emphasize the use of the approach in an operational context; the sector specific volumes provide short technical descriptions of the relevant industrial products and processes as well. The general methodology volume will be published before the end of this year; subsequent volumes will appear in 3 to 4 month intervals.

In addition to the written output, other dissemination devices are being used. Workshops have been held in and outside the Bank. Among the latter was one organized jointly with the OECD, and hosted by the Yugoslav Government in Portoroz; it was attended by over 150 representatives from OECD countries. Furthermore, as a rule, seminars and work shops are given in connection with case-studies (e.g., Egypt, India, Andean Pact). Finally, in this context, presentations have been made at ORSA/TIMS meetings.

In our experience, the most effective dissemination device is the case study approach, involving local, well-trained staff. In particular, we consider as successful a formula where the case study involves a graduate student in engineering or economics, from the country under study, who is fully involved in all stages of the study.

In addition, an approach currently under consideration is the organization of an EDI course, inclusive of a demonstration case study.

Resources

The research program has always enjoyed sufficient financial support from the Bank's Research Committee, and a total of around $425,000 was invested in the research project in this manner. Moreover, as the operational usefulness of the methodology became clearer, substantial funding was attracted from other sources, primarily to finance case-studies. For example, case-studies of the Egyptian, Indian and ASEAN fertilizer sectors were financed by the Industrial Projects Department, East Asia Projects, and South Asia Projects, and involve a total of about $75,000. The study of the Andean Common Market had a budget of $90,000, jointly shared by the Bank's Industrial Projects Department, Inter-American Development Bank, and Andean Pact. The Turkish Industrial Development Bank, under whose auspices the chemical sector study in

Turkey is being carried out, envisions a budget of around $1 million, which it proposes to finance from its own sources. The Korean Government has been advised to approach UNDP for the finance it intends to carry out with our help. Finally, the studies of the forest industries sector in various regions in the world, carried out by FAO, are entirely financed from UNDP funds, at a total cost of more than $1 million; most of this is for data collection.

In contrast, the internal staffing situation of the project has almost always been close to a critical minimum. Initially, all participants in the project were consultants, as mentioned before. As the research reached a more operational stage, the use of outside consultants was gradually decreased and more internal staff was associated with the project. However, at no time have more than three professional man-years per annum been devoted to the research.

At the present time, the situation has become critical. Not more than about three man-months of professional time is available per year to carry out the dissemination effort, and resources available for further model development are minimal; in fact the only relevant research carried out in this context is that focused on technology choice in mechanical engineering. The researchers have already reached the stage where they have to turn down requests for assistance, or restrict themselves to sometimes irresponsibly limited levels of advice. To the extent possible, former collaborators on the project are being used as consultants. However, it is quite likely that with the publication of the manuals, the number of requests for assistance will reach a level where the Bank will find itself in the embarrassing

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with the publication of the manuals, the number of requests for assistance will reach a level where the Bank will find itself in the embarrassing position of having successfully disseminated a planning methodology, while not being in a position to assist in the subsequent assimilation effort in member countries.

Issues for the Future

The main issue facing the Bank at this time is whether and how to disseminate this methodology further, both with regard to its own project work and that carried out in its member countries. It seems clear that the project has achieved its original objectives, in the sense that a method has been developed and tested that provides an operationally meaningful approach to project identification and subsector planning. In terms of written output, the project has probably gone as far as one can go, given the current state of model development. The main questions relate to the intended audience, and the conditions that need to be met for effective dissemination and assimilation.

Within the Bank, it would appear that the little attention paid to systematic sector planning, particularly in the industrial sector, precludes widespread use of the method: the currently practiced project-by-project approach is likely to prevail for some time. In any case, given present staff constraints in the industrial field, it is unlikely that an expanded work program on industrial subsector planning can be accommodated.

Outside the Bank, the situation varies from place to place. If our case-study experience is any guide, it is clear, that within the context of a relatively long-term and joint effort, the essentials of the approach can be transferred to someone with some background in mathematical economics. In

other cases, substantial technical assistance from the Bank is needed. How should the Bank respond to such requests in the future? Where should finance come from? Currently, various ad hoc solutions have been found or suggested, combining funds from the Research Committee, the Regional Offices, UNDP, other international organizations such as IDB, and the relevant counterpart organization. However, invariably, the financing arrangement is messy and time-consuming.

The scope for further research in this area is wide. An earlier attempt to incorporate uncertainty into the planning model failed. Nevertheless, this aspect of the planning problem is sufficiently real to warrant a further research effort. Moreover, although vastly improved, solution methods for this class of model remain inefficient; should further work be contemplated? Finally, research experience is restricted to a few industrial subsectors, and the question may legitimately be raised whether it would not be desirable to construct formalized approaches for other subsectors as well. While discussing this issue, it should be borne in mind that research on the non-process industries is progressing under a different RPO.

It would appear that the establishment of a special unit within the Bank, specifically in charge of further work in this area, would be justified. Such a unit, with a minimum of 3 to 4 professional staff members and a similar number of research assistants/programmers, could have the following tasks: (1) further application of the method for the industrial sub-sectors where the research phase is concluded; (2) further research on directly related byt as yet unresolved issues; and (3) expansion of industry coverage, including analysis of important natural resources and derivates on a world-

wide basis. The alternative to this organizational step is, for all practical purposes, the discontinuation of Bank involvement in this area once the manual series described above is completed. In that event, it may be hoped, international consulting-engineering firms (some of whom have already expressed an interest) will capitalize upon this Bank effort.

OFFICE MEMORANDUM

TO: Mr. David Gordon, DFC

DATE: November 22, 1978

FROM: Benjamin B. King, DEDDR

SUBJECT: Trade in Manufactures

I am forwarding Don Keesing's memos (attached) at his request, but would like to say a few cautionary words which may place his admirable enthusiasm more in context, at least as far as this department is concerned. Here are some points worth noting:

(i) We have an informal agreement with Helen Hughes that EPD will gradually take over the reporting function on exports of manufactures. The modalities of this have still to be worked out, but the idea is that a group in our Industry Division (about 3 professionals plus research assistants) would then be free to do research and give back-up advice.

(ii) This allocation of resources would, of course, be depleted to the extent that WDR continues to preempt so much of the group's time. It is my hope that an ad hoc nature of WDR organization will ultimately be replaced by a more stable one. There is some indication of this.

(iii) It is worth noting that the main orientation of this department is micro rather than macro. While the two can never be wholly separated, it makes more sense to place the emphasis on macro trade matters elsewhere, primarily in the EPD.

(iv) There has, as you know, been a severe constraint on DPS staff resources. For increases at the margin, if any, there are many competing claims.

(v) I'm not sure that I share Don's preference for generals; lieutenants, sergeants and privates have their place, if properly led!

Attachments

cc: Mr. Chenery
Mr. Karaosmanoglu
Mrs. Hughes
Mr. Stoutjesdijk
Mr. Balassa
Mr. Streeten
Mr. Acharya
Mr. Westphal
Mr. Keesing

OFFICE MEMORANDUM

TO: Mr. D. L. Gordon, Chairman Industry & Trade Research Steering Group
(thru: Mr. B. B. King, Director, DED)

DATE: November 17, 1978

FROM: D. B. Keesing, WDR Core Group/DEDND DBK

SUBJECT: Need for More Work on Trade in Manufactures

1. The attached memorandum of August 21, though hastily written for internal purposes, captures some of the urgency of expanding our work on trade in manufactured products. Thus, it may be useful for the Steering Group and for the Research Advisory Panel on Industry and Trade.

2. Because of its narrow purpose and focus, the memorandum does not discuss either the wider context and history of work in this subject, or how new policy studies would relate to existing and proposed research. However, the Steering Group and Advisory Panel are almost certainly so well informed on research projects that they can work out most of the connections for themselves.

3. A few points might be useful to clarify the context. When our Economics of Industry Division work program on manufactured exports from developing countries was launched in January 1976, I recommended a phased expansion to a staff of at least four to six professionals. In my judgment this number would still be highly desirable, though whatever the number, our main need is for very experienced people in this area. At one time, over a year ago, we reached a level of three people (only one of them senior), but one of the more junior people (Kemal Dervis) was soon diverted to other work, the other is in process of leaving, and I have been pulled away to work full time on the second World Development Report. So we are now back nearly to zero.

4. In regard to research, I believe that with more staff, much useful research could readily be designed in this area to match some of the subjects mentioned. However, with no staff and not enough time to do existing research, it would be quixotic of me to put new proposals on paper. Our first need in trade is staff in my group or somewhere!

5. Whatever may be decided on the future of trade work in the World Bank, I believe that what has happened to this small program on manufactured exports illustrates some of the problems we run into, in the Development Policy Staff, from insufficiency of resources and inability to concentrate the ones we have. Right now we are badly overextended in trade, and unable to meet a widely perceived need to follow up the work we have already done, except on the basis of a fraction of a man-year of work here or there, by overworked staff at the cost of some other pressing priority.

DKeesing:mm

Attachment

cc: Recipients of August 21 memo;
Mr. S. Bery, VPD

OFFICE MEMORANDUM

TO: Mr. Benjamin B. King, Director, DED DATE: August 21, 1978

OM: Donald B. Keesing, WDR Core Group DBK

New World Bank Requirements for Work on Trade in Manufactures

1. World Bank requirements for work on trade issues, and especially developing countries' manufactured exports, are in the process of shifting and expanding in ways that call for rethinking our work program and objectives.

2. Up to now our program in this area has been designed to serve the internal needs of World Bank operations through a combination of reporting, advice, mission participation and practically-oriented research. The expectation has been that there would be a useful spillover for the academic community and other specialists in development, and the participants would also engage in policy work part of the time; but these have been viewed as side benefits rather than principal objectives of the work program. Now with the World Development Report raising new expectations by concentrating heavily on trade issues, we have to reevaluate our objectives.

3. The internal requirement is as strong as ever. In practically all the large developing countries, the Regions are mounting efforts to analyze industrial issues and needs in greater depth than before, with much emphasis on trade questions and policies relating to exports. Many smaller countries are becoming concerned with their industrial exports, and are asking for missions and advice. If I had the time, I could fill up my calendar for the next year and a half, twice over, with missions along these lines; and there is also a tremendous matching demand for advice here at Bank headquarters, on the work being done and the recommendations being made. At the same time there continues to be intense interest in our reporting and our projections work; the demand is especially great for projections by country and region, and estimates of what products have strong prospects in what countries, though, of course, we are generally unable to provide much guidance here. Our research based on interviewing of firms is also very well received. The Regions involved are consistently interested in the research on export marketing. Research which we would like to do, on the marketing, technical servicing, and financial aspects of exporting capital goods, would be enthusiastically welcomed. In all these respects the work program as it is now conceived seems well aimed toward the Region's needs. The big problem has been, of course, finding staff and time to do the job, in face of inadequate staffing and constant competition from policy work.

4. The newest demand comes as an outgrowth of recent Bank policy work in the trade field, especially the World Development Report. Suddenly the Bank has been seen by the international development community, and its member nations, to have a capability to do impartial, in-depth, quantitatively-based reporting and analysis on developing countries' trade prospects and surrounding policy issues involving developed countries as well as developing ones. Our perceived capability in this area relates so far mainly to manufactured goods. The Bank's initiative in analyzing

these subjects, and its leadership in suggesting what is needed, have been enthusiastically welcomed by the Bank's Executive Directors and the member countries they represent. We have also received a very favorable reception by the press and by people and organizations that can be taken as representative of the "intelligent laymen" in this field--people concerned with influencing policies, making business decisions, and the like.

5. In response to this demand, it now looks as if WDR work, or the equivalent, will be required beyond WDR II, and trade, protection and related issues will be a major subject in every successive WDR. This already poses a difficult challenge since it becomes hard to say something new on the policy front, without a lot of new work. But the WDR requirement may be symptomatic of a bigger need.

6. This is a field in which public interest runs high and can be expected to persist in years to come. No other set of issues is more on the minds of the world's policy-makers and business leaders in regard to development--the main rival is the debt and private borrowing situation, where the Bank is also becoming a major source of reporting and analysis. To our surprise we have found that in trying to do careful, quantitatively-based reporting and analysis of trade issues, building on recent numbers and Bank projections, we are pioneering and filling a gap, despite the work already being done by other international agencies, the academic community, business writers and commercial researchers. The public and governments alike appear eager to see us do more. In view of the importance of trade for the developing countries, Bank management at the highest levels is also eager to see us do more, provided we can do it well and deliver something useful to the international community. Thus, we now face a need to raise our sights in our work program and think about what analyses in depth would be fruitful in meeting the needs of international decision makers and the broader public.

7. Presumably we would require a widely published and circulated, carefully produced, and quality-controlled output, designed to meet internal needs of the Bank as well as outside needs. There may be a tremendous potential here for contributing to the Bank's prestige and public visibility, and even more important, for influencing world opinion and contributing to development, but only to the extent that the job can be well done. With the Bank's reputation at stake it is essential that the work be of good quality and well aimed at questions of great interest, suitable for careful, quantitative, balance analysis.

8. I have a sense that there are plenty of questions of this type, though there are also issues where we would want to back away, either before or after making an analysis for our own inside purposes. It also seems to me that the pressures on the Bank to look at some of the trade issues, and to say more than what is said in WDRs, are likely to become overwhelming, so we had better start getting ready (and staffed) to do some good work in this area.

9. Let me cite examples of work that may be needed.

--In regard to protection, where our WDR I discussions have been well received and have raised expectations for more in the future, we would fill a big gap if we would analyze carefully the impact of major protective measures--such as EEC and/or U.S. textile quotas, the new orderly marketing agreements in footwear, restrictions and minimum price schemes in steel--on the growth prospects of individual developing countries or groups of countries. Here, of course, my textile and clothing paper (when it finally gets finished) helps to give us a start, as do our WDR background papers and EPD's efforts to get together data on protection, but much more may be needed.

--There is a need to analyze, more than we have yet done, what policies the developing countries would be wise to follow in the face of mounting protectionism in developed countries.

--Related to this, more work is needed on trade in manufactures among developing countries: the nuts-and-bolts details and trends, the potential benefits, possible measures to promote this trade, and surrounding policy issues, some of which involve basic questions as to the extent to which developing countries should design their own technologies and consumption styles. There seems to be much interest in our doing a technically-sound analysis here. Even if we are not very optimistic about the possibilities, we are likely to be asked to spell out our reasoning and evidence.

--We must not neglect our bread-and-butter questions regarding trade and industrial policies that developing countries should follow. Here we are likely to find that with the added stimulus of WDR work we will have new things to say, leading to publishable papers. For example, there may be new things to be said regarding policies in countries with special characteristics--least developed, very small, very large, mineral-rich, etc. Certainly we need more work, including studies of Bank experience, on industrialization and trade outside the main semi-industrial countries in which past research has been concentrated. As a result of WDR work, and/or the Robinson-Dervis work on Turkey, we might also find new things to say regarding such matters as distributive and poverty-alleviating affects of alternative trade policies, and lessons of experience in regard to transitions to more desirable trade policies. Hopefully our new research projects will derive lessons on how to promote marketing of manufactures. Insight in this general area has been one of our aims all along, but WDR work gives us new perspectives and new readerships.

--A subject of enormous international interest, where our past work and WDR I presage much more in future, is the future progress to be expected from developing countries in their manufactured exports. Here, for example, there is much concern over how rapidly the leading developing countries (and others after them) will be able to diversify into capital

goods and other skill-intensive industrial products. There is also a need to look more carefully at the prospects of the less developed among the developing countries, and to call attention to the manufactured (and total) export picture in those that are not "newly industrialized countries." Then there is a need to look further at the total dimensions of the world market for the industrial products (and the whole set of products) in which developing countries are now or are likely to be most successful, relating this to the dimensions of their export needs. It would also be useful to project, 10, 15 and 20 years ahead, what the "newly industrialized countries" will be like, to see to what extent their wages and export needs will be a disruptive force. All of this would be a continuation of the work we (and others in the Bank) are already doing, in response to a strong need for such work to meet the needs of Bank operations and developing countries. But the new twist here is that governments and businesses in developed countries are intensely interested in what we learn.

--The other side of the same exports is what happens in the developed countries. Here the big new Baldwin and Waelbroeck research projects promise to give us a good deal of information. However, no matter how well they answer our questions and meet the need as research, there will surely be a demand to carry the analysis further and to convert their findings into policy papers.

--WDR I has also put us in the business of commenting on adjustment issues and policies in the developed countries. Here Martin Wolf will do a major paper as backgrond for WDR II. This is likely to trigger a demand for further analysis, including work on the benefits from adjustment.

--In addition and as a complement to all these studies relating to manufactured exports, work is badly needed on imports of manufactures by developing countries--what they are, where they go, who supplies them, and their relationship to exports--and their implications for the policies of developed countries as well as developing ones. EPD is studying the links on a broad modeling level but there may be a need for policy purposes to indicate the industries and countries and the links to exports at a more detailed level.

10. I have purposely left out of this list trade-related issues where EPD would clearly have the main responsibility, for example, those involving primary exports, export processing, global modeling and interdependence, trends in total exports, price projections, and trends in protection. The subjects I list have all been treated so far, if at all, by the Development Economics Department together with other Bank units, cooperating on an informal or ad hoc basis.

11. How much we can do, if anything, to expand our work program and that of DPS as a whole in these areas obviously depends on questions of staffing. With our present staffing, it is doubtful that we will be able to maintain even a minimum program on manufactured exports, along the lines intended up to now. The operational support and reporting part of this program has practically ceased for the time being to make way for WDR II, and the research has been disrupted. It is also not at all clear that we can meet the minimum needs of WDR work no matter how much we cut back the rest of our program. For example, it is completely unclear who in the Bank will be available to do the WDR Core Group trade work, or the support work, for WDR III. On balance, compared to a year ago, the Bank now has fewer senior people in trade, and, of course, the Development Economics Department has also been weakened in this area.

12. Senior people in the trade and development field, in the Bank as a whole, are the key resources which is critically short, though, of course, it also matters greatly how these people are organized and what they are asked to do. Experience up to now in our trade work shows that particularly in regard to policy issues, but also in regard to analytical studies using non-standard methods or much judgment, good work in this field depends on senior people, who must have wide experience in trade and development issues, along with exceptional abilities. Junior, inexperienced or weak people are practically useless. Indeed, if there is a need to supervise them carefully, their net contribution can easily be negative. Use of senior consultants or else research assistants is likely to yield better results. The subject matter is too complex, with too many sides to it, to entrust the work to anyone who falls short of a very high standard. Other international organizations which do not have enough people of the highest quality do dull, useless, and often misleading studies. Unless we are staffed to do the job right, we shall do the same.

13. In my estimation, whatever success we have had up to now in the analysis of manufactured exports and surrounding issues of trade policy, has been made possible by bringing together within the Bank several top quality trade experts, whose exchanges of ideas have led some of us--certainly they have led me--to do much better work than we would otherwise have done. These people are almost all in different units and have always been few in number, but by comparison with other international organizations and research centers we have been exceedingly rich in first-rate people working together.

14. To expand the Bank's work program in this area seems to be feasible, with potentially excellent results, but it can only be done by bringing in several first-rate senior people and putting them to work on these issues. This appears practically impossible within the Development Policy Staff, let alone the Development Economics Department, under present staffing constraints, for two reasons. One is the nationality constraint interacting with an inability to attract suitable senior people apart from U.S. nationals. In the world as a whole, there are

only a few dozen people of sufficient quality and experience to help, and the non-U.S. nationals are all tied up in prestigious or powerful positions from which we generally cannot budge them for positions at less than an N level, and lately not even at that level. Thus the added senior people would have to be almost all U.S. nationals, though one or two could be drawn potentially from existing Bank staff now working mainly in other areas. Second, as a rule, the DPS does not have senior-level positions (for example at the M level), to offer these people.

15. In view of these staffing constraints, I recommend that we tell Bank management that this possibility exists, and that we would like to do the job but we can't get the people to do it unless they change the rules. Specifically, I recommend that the two Departments most concerned be given the authorization to recruit one U.S. national each at the M level this year, into what would otherwise be a slot at the L level. Within the next year every effort would be made to bring in two more senior people, one per department, perhaps by switching people from other tasks within the Bank. These people would be given research assistants and, eventually, one or two junior people to supervise, and together with everyone concerned in the Bank's management, we would work out a division of labor and work program based on a high degree of cooperation and frequent exchanges of ideas.

16. Bank management needs to be clearly told, in making its decisions, that if we do <u>not</u> get at least one or two more senior people, we shall have to curtail either our regular trade work or our WDR trade work, at least in the Development Economics Department, and probably in the Bank as a whole. If we are to expand our program in the directions suggested above, to meet the hopes raised by WDR, we are going to need four or five more senior people in this field. If the decision is made clearly on this basis, and our workload and expectations are adjusted accordingly, I shall be pleased no matter which way the decision goes.

cc: Messrs. Chenery, Karaosmanoglu, Balassa, Streeten, Acharya, Westphal, Colaco and Mrs. Hughes.

DBK:nb