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3.1

EVALUATION OF WORLD BANK RESEARCH ON INDUSTRY AND TRADE

Incentive Policies and Economic Integration (Ch. III-1)

The Subject  
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1. The following evaluation is based on a sample of five RPO projects: (1) RPO 670-01, Development Strategies in Semi-Industrial Countries (directed by Bela Balassa); (2) RPO 670-22, Economies of Scale and Tariff Levels (Gary Pursell); (3) RPO 670-87, Industrial Policies and Economic Integration in West Africa (Balassa); (4) RPO 671-10, Promotion of Nontraditional Exports (David Greene); (5) 671-75, International Trade Policy for the Development of Bangladesh (C. Jayarajah). Four additional non-RPO projects (three by Balassa, one by Stephen Guisinger) will be referred to where appropriate. Seven out of the nine projects under review have been completed - successfully as will be shown below. RPO 671-75 is to be completed by November 1979, whereas RPO 670-22 has never produced a final report.
  
2. Most projects deal with the role of incentive systems in economic development, from both a theoretical and an empirical standpoint. They examine primarily alternative forms of import protection, export promotion and economic integration, and they analyze the effects of these measures on the allocation of resources, the balance of payments, the generation of employment and the overall growth in developing countries. Moreover, there have been attempts to evaluate incentives on a firm-by-firm basis and to appraise the impact of protection at the level of individual investment projects.

3. 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.

#### Review of Projects

4. From both an operational and a policy-making point of view, the main contribution in the field under review is the project on Development Strategies in Semi-Industrial Countries, (henceforth "Strategies"), by which the World Bank has continued and deepened its research on (trade) incentives; work in this area has been closely connected with the Bank's main policy interests since 1967. The "Strategies" project started in mid-1971 and was completed, with a formidable volume of over 1200 (double-spaced) pages and tables, in mid-1978. Its purpose was to quantify and analyze relative incentives provided to import substitution and export expansion in countries pursuing different development strategies, which have already established a relatively diversified manufacturing sector. For the sake of comparability, the project concentrated on six countries at a similar level of industrial development: Argentina, Colombia, Israel, Korea, Singapore, and Taiwan. Ar-

gentina 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 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.

5. The methodological framework underlying this project 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 at a reasonable level of sector disaggregation, the "Strategies" 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.
6. That the analysis in the "Strategies" project 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 inter-

preted in a comparative way rather than in isolation. General equilibrium models tend to have a rather limited explanatory power, let alone their high sensitivity 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 up-dated. An earlier completion of the project - originally planned for the second half of FY 1973 - was outside the realm of possibility given that various researchers were unexpectedly absorbed again and again by other duties in their own countries. Thus, the delay has to be interpreted as the price to be paid for embarking on large cooperative ventures amongst Bank's researchers and external economists; the "price" has been kept as low as possible, however, by circulating draft versions of various chapters well ahead of the project's completion. With regard to an up-dating of the results, one should remember that 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. Had the "Strategies" project included these changes in the analysis, its results would have become even more significant than they are in any case. Of course, we are aware of the practical difficulties in maintaining up-to-date a comprehensive analysis as this one; it probably would have required a full-scale re-estimation of the effective rates of incentives. We therefore think that there is a need for the Bank when applying this research to up-date the results. The Bank is, as compared to academic institutions, in a favourable position to make such an effort; it has the staff and it can try to collect at least part of the required information through the economic missions which regularly review the LDCs.

7. 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 nontraditional 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 "Strategies" 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; scepticism with regard to the usefulness of this type of research prevails within the IPD staff, which has little to do with incentive systems, however. 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.

8. It should also be noted that researchers from the countries concerned have been involved in the "Strategies" 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 influenced policy decisions 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 competi-

tiveness. Furthermore, one of the authors of the chapter on Argentina of the "Strategies" 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, as a following-on to "Strategies" project. In Korea, Singapore, and Taiwan, where the authors have moved into prominent governmental positions, economic policy-making takes into account the recommendations which were formulated in the "Strategies" study. Thus, this work has contributed, directly and indirectly, to promote applied research in Bank's member countries, which is also a central objective of the Research Program.

9. Studies of this type are not only worthwhile because they may assist in shaping more rational incentive policies in the countries concerned. They are also important for the lessons they can provide for many other LDCs at lower stages of economic development. As one never can take for granted, however, that these externalities will be automatically internalized by those other countries, it always is helpful to extend the regional coverage of the research on incentives. The project on Industrial Policies and Economic Integration in West Africa was a useful extension of Bank's research in this field. The project was initiated in mid-1973 and completed in end-1978 (as scheduled). Its purpose was to appraise the potential of, and obstacles to, industrial development and economic growth in small, primary producing countries under alternative policies, including expansion of intraregional trade. Four countries were chosen for analysis: Ghana, Ivory Coast, Mali, and Senegal. They differ from those studied in the "Strategies" project in that they are less developed and have not yet

established a diversified industrial base. The incentive systems of these countries have been analyzed with regard to their impact, within the industrial sector, on import substitution within each country, increased intraregional trade, and expansion of exports to third countries; furthermore, the structure of (long-term) comparative advantages of these countries, in both agricultural and industrial activities, has been evaluated.

10. In measuring the incentives, basically the same methodology was applied as in the "Strategies" project. However, the rates of effective protection and effective subsidy do not reflect accurately the comparative advantage or disadvantage of particular activities since they are calculated on the basis of market prices rather than shadow prices. For this reason, this project has rightly applied the domestic-resource-cost concept as well as estimates of the cost-benefit ratio for foreign capital in measuring comparative advantages - using, as in the calculation of incentives, firm level data. While the findings provide a clear indication as to substantial incentive-generated distortions and a great diversity in the domestic resource costs of foreign exchange, they should be taken as reflecting orders of magnitude rather than exact quantification. As the authors themselves admit, the data are not completely reliable in all cases and the estimation of shadow prices, particularly of the shadow exchange rate, always involves some uncertainty. The sensitivity of the ranking of activities in domestic resource costs to the shadow price assumptions has been tested in the studies on Ghana and the Ivory Coast; such alternative estimates are still to be done for Mali and Senegal.

11. Research undertaken in this project was, as the "Strategies" project, most useful for the Bank's immediate operational needs. Indicative of this is the fact that the project was carried out in close cooperation with the Western Africa Regional Office and with support from the Industrial Projects Department (of CPS). The operational staff found the methodology, the empirical results, and the policy recommendation useful in evaluating government policies and programs in that area. Recently, the regional office has even undertaken the initiative to follow-on the research of this project by studying the effects of trade and other incentive policies on resource allocation in Cameroon (which is the dominant member of the Union Douanière et Economique de l'Afrique Centrale). And the Agricultural and Rural Development Department (of CPS) is now sponsoring a comparative study on the economic effects of price interventions in agriculture. The West Africa research project has also influenced policy-making in the countries concerned. For instance, the analysis of Senegal has led to the preparation of a tariff and tax reform; and the Nigerian Government has invited and financed a special World Bank mission in order to obtain guidance on the costs and benefits of a revised system of incentives, using the same methodology as in the West Africa project.
  
12. Operational guidance with regard to an Asian nonindustrial country is expected from the ongoing project on International Trade Policy for the Development of Bangladesh, which has been initiated by the South Asia Regional Office. This project may be considered as a country application of the effective protection - domestic resource cost methodology. It aims at three objectives, according to the project proposal: (i) to assess the structure and functioning of factor and product markets with a view of identifying relative

resource scarcities at present and in five years from now; (ii) to determine the structure of comparative advantages for existing agricultural and industrial activities as well as for new industries which might be established in the future; (iii) to design a trade policy, properly synchronized with domestic incentive measures, conducive to a removal of the balance-of-payments constraint to Bangladesh's economic development by encouraging investment in activities in which the country has, or can develop, a comparative advantage. Doubtlessly, these are important subjects. Whether or not the analysis can be conducted at a high rigor will crucially depend on data availability. The project proposed displays much optimism in this regard, but there is a risk that difficulties in collecting the needed information become enormous. That the execution of the project involves researchers from Bangladeshi institutions might facilitate the access to existing though not published data. But the real problem is that the existing stock of statistical information in Bangladesh is far from being sufficient to measure shadow prices, quantify incentives, and calculate domestic resource costs. There will be an inexorable need for additional data collection by the researchers themselves. One should therefore not be surprised if the research leads to a narrower range of permissible conclusions than is expected, or if its completion will be delayed.

13. 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 - and has in fact considered helpful by an internal evaluation report.

14. Basically the same conceptual framework as in the "Strategies" project referred to above was used to examine empirically the relationship between levels of protection afforded to nine individual IFC projects and their economic efficiency. It is shown that conventional measures of effective rates of protection do not provide all information which is required for making decisions at the project level. For, 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 aspect to be taken into account by all Bank staff members involved in investment project appraisal. While this is recognized in the corresponding offices (including the IFC itself), we have also to emphasize that, from an operational point of view, both Bank's researchers and officers would face serious data problems. The "Strategies" project 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 comparison for a period of years in the future, as required ideally in solid investment appraisal at the project level. In order to make things easier, one could have thought of applying the domestic-resource-costs methodology since then there is no need of information on future protection. The use of this method would have been desirable anyway, because the study analyzed incentives mainly with regard to product markets, while it should have been extended to include also factor markets where distortions have their repercussions on product markets. These objections notwithstanding, this project 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 the pioneering work has been done by researchers within international organizations involved in this business.

15. In estimating the effects of protection on efficiency, the projects reviewed hitherto were mainly concerned with the allocation of resources within the economy. But protection not only permits domestic production that would not be able to compete with imports in a free trade situation (allocative inefficiency), but also permits poor performance in the protected industries (X-inefficiency). Comparison of the types of protection-induced inefficiencies and an assessment of the relative importance of the two is proper indeed. The project on Economies of Scale and Tariff Levels was supposed to study this subject explicitly, with Colombia, Indonesia, and the Ivory Coast as case studies. The research has yielded a first conceptual draft containing a priori propositions about the X-efficiency consequences of import protection. There is also a first draft available for the case study on the Ivory Coast (including five industry analyses) and, as a by-product, a case study on Iran (with three industry analyses). The project was, however, never completed: The access to data proved to be much more difficult than anticipated, in the case of Indonesia there was no way at all; the Colombian consultants to whom the Colombian study was commissioned reportedly did not have the experience and capability for doing good work in this

field; and the Bank's responsible researcher was absorbed by other duties. In retrospect, the project, although reporting about some interesting empirical findings which are not elsewhere available, must be considered as a failure.

16. The project on Promotion of Nontraditional Exports is, by comparison, more descriptive. Carried out in cooperation with the Economic Commission for Latin America, the project aimed at evaluating export expansion policies, with particular reference to Argentina, Brazil, Colombia, and Mexico. For greater comparability, the project was extended to include also the experience of non-Latin American countries, namely India, Israel, Korea, and Yugoslavia. The initiative was taken by the Latin America and the Caribbean Regional Office. In general, the country studies have surveyed the existing stock of knowledge in this field, rather than increasing it through new empirical investigations. Their significance for policy-making is, however, great. It is shown that economic policies of developing countries have a substantial impact on the evolution of new manufactured exports, and in this regard this project has complemented the "Strategies" one. It is an example of how Bank's research findings relating to incentive policies can be diffused among both the Bank's operational staff and local researchers as well as government officials in developing countries.

#### General Evaluation

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17. The studies on incentive policies and economic integration, which have been completed so far, show five 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 (see Annex, to be compiled by the Bank), and thereby to contribute to the effective dissemination of the findings. 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 complementary to the research in the field undertaken elsewhere (UN 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. And fourth, the studies have been designed with a view of responding to important needs of the Bank's operational departments. The research was empirically oriented, what is of paramount importance if soundly based policy prescriptions are to be achieved. In fact, the operational staff is to a large extent convinced of the relevance of this research, and has expressed this by applying the findings of the research in country economic reports and policy analyses, by using the methodology for in-house quantifications of trade incentives, and by initiating additional research in this area. And fifth, a great deal of the studies reviewed has involved participation from developing countries - in most cases relatively successfully. This is a significant achievement since it could help to strengthen the role of rational choices in the political decision-making process in the countries concerned - to the benefit of their economic and social progress.

18. As the research in this field places high demands on the data, the Bank has proven to be an appropriate place for under-

taking it, given its experience, as well as the fact that researchers from academic institutions usually 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 was - due to its leverage - in a good position to induce governments in developing countries 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 was 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. Research inside and outside the Bank was complementary to a significant extent; the Bank exploited its comparative advantage even more by concentrating on comparative studies. And more fundamentally, advances in policy-oriented research, including its methodological foundations, are normally greater, the greater competition among researchers is - analogous to the productivity growth in an economy which results from active competition in product and factor markets.

19. With regard to the relationship between research and operational activities, one important lesson can be drawn from the studies on incentive policies and economic integration: While it may not always be possible to 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 sensitize the country economists in the regional offices and to influence lending operations. Particularly, this work helped them to fully understand the efficiency problem at both the macro- and micro-level and to explain its implications to governments in developing countries. It is noteworthy that, until the

early seventies, Bank's economic and sector missions to developing countries used to adopt benevolent attitudes as to (protectionist) import substitution policies, while they now advocate vigorously for fairly neutral incentive systems combined with reasonably liberalized trade regimes and realistic exchange rates. Moreover, specific investment recommendations are based now more often on comparative advantage criteria than it was the case until recently.

20. As the effective protection-domestic resource cost methodology can be considered as matured and understandable for the operational staff, the past research under review has established the conditions for entering the application phase according to concrete demands.

The preparation of other (comparative) studies on incentive schemes may involve, from a purely academic point of view, diminishing returns - a point emphasized by the DPS staff. But yet, many developing countries 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 developing countries 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 countries concerned, frequently lack this influence. This is particularly important with regard to the question of how a successful transition to a more efficient incentive scheme could be made in practice. The answer to this question,

while touched upon in past work, still requires a good amount of research anyway.

Areas for Future Research

21. From the above it follows, that Bank's research for appraising incentive policies should not be totally discontinued, though shifted in emphasis. To begin with, it would be desirable to investigate in-depth the existing incentive regimes with regard to factor markets, the implications of these regimes for both the functioning of product markets and the changes in the structure of trade, and the avenues of eventual reforms. Second, analyses of the existing or required overall incentive systems in natural resource-rich developing countries, in countries which are just beginning their industrialization, and in very low-income countries are of interest for assessing the prospects of self-sustained economic growth and successful integration into the world economy or, by contrast, the (potential) advantages and disadvantages of pursuing the "basic needs" approach combined with a strategy of (total or selective) delinking from the international economic system. Third, the continuation of research on promotion and diversification of manufactured exports, with emphasis on marketing aspects and on the contributions which export processing zones can make, is of considerable importance to developing countries and to Bank's policy advisory work as well. In this connection, the relationship between the emergence of export industries in developing countries and the implementation of discriminatory protectionist measures by developed countries should further be analyzed and then kept under review. Furthermore, policy changes in developing countries with regard to export promotion and import substitution as reaction to external

shocks should deserve some investigations. Fourth, and given its importance for Bank's lending, research on future world trade patterns - with particular reference to changes in export structures of developing countries according to their stage of development, the size of their domestic market, their endowment with natural resources, and skill levels in their active population should be intensified.

22. As regards research on economic integration, there are at least three subjects where further research is of importance. One would be to follow-on the work on Western Africa's integration referred to above by investigating the effects of the Fonds Communautaire de Développement on investment patterns, the impact of the monetary union on the international competitiveness of industries in the countries concerned, and the consequences of the Taxe de Coopération Régionale for the structure and intensity of intra-regional trade. Second, the different avenues of economic integration among developing countries (i.e. regional versus inter-regional framework; mutual trade liberalization versus product specialization agreements; customs union versus free trade area) should systematically be analyzed, taking into account the factors which have contributed to the many failures of integration schemes in developing countries in the past. Third, more insights into the costs and benefits of economic integration among developing countries should be provided for operational purposes.
23. These are some illustrative issues which, in our view, have important applications in the Bank's advisory, financial and industrial sector work. Obviously, the various topics are linked together at many points. As staffing constraints might not allow to expand research into all areas outlined

above at the same time, priorities among them should be established by the Bank's Research Steering Group according to actual and potential policy and operational needs with which this Group is more familiar than we are. We strongly suggest, however, that once resources have been allocated to specific lines of investigation, the completion of the work should not be threatened by overloading the responsible researcher with too many duties (as it was frequently the case in the past). If the in-house demand for policy work increases, and if this increase is not only temporary, we recommend that the Bank enlarges its research staff accordingly.

3.2

## COMPARATIVE ADVANTAGE; TRADE PATTERNS; ECONOMIC GROWTH

Edmar L. Bacha  
January 1979

## Chapter III.2

## 1. INTRODUCTION

This chapter addresses a set of projects on general equilibrium trade models, comparative advantage structures, patterns of industrial development, and sources of industrial growth.

The next section contains a project by project review, which is followed by a general evaluation of the field. The chapter closes with a brief discussion of possible future extensions of the research under review.

## 2. PROJECT REVIEW

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.

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 papers appear to be very innovative. 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 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 Singapore, 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. One piece was written on the migration of Japanese industries to Taiwan and South Korea, and the other 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. One at least delivers his message in a readable format, while the other 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. This is a pity as the subject matter appears extremely important to inform the industrialization strategies of developing countries.

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

The main purpose of this project seems to be 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 responsibility 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 an 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

for the World Bank work on industry and trade. 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 apparently the operations staff of the Bank are making use of 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 an accounting identity asserting that, for any sector of economic activity, domestic production is equal to the sum of domestic intermediate and final demand plus export minus imports.

Observed changes in sectoral domestic production through time are attributed to changes in domestic demand, exports, and import substitution, and "growth contributions" are computed for each of these demand components.

Deviations of the sectoral production levels 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 the accounting identity above permits the calculation of the "contributions to structural change" of each of the demand components.

Emphasis of the analysis is placed on exports and on import substitution. 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.

Parallel 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 twenty-year quest to establish an empirically based paradigm for modern industrial growth. It demonstrates the importance 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 accounting identity. However, as his papers for the Nobel Symposium and for the Tokyo IEA Congress (the later co-authored by Syrquin) demonstrate, within an 18-year period such simple exercises allowed the organization of a considerable body of empirical knowledge regarding the nature of modern industrial growth.

It is unlikely that 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 has a limited interest. 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 industrialization processes. They would overcome the partiality of the "sources of growth" studies, and provide an 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, perhaps it 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 would seem more appropriate to accept with scientific modesty the enormous size of our ignorance, use simple tools and proceed bit by bit. The answer<sup>apparently</sup> 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.

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 comforting to orthodox trade theory. The Tokyo paper also serves the purpose of dispelling some of the "export pessimism" that became fashionable since the oil crisis, when it stresses the importance of supply side factors to the success of export promotion policies for manufactured products.

A minor complaint relates to Balassa's propensity to carry his findings perhaps a bit too far. For example, on p. 24 of the IEA paper he asserts that 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.

### 3. GENERAL EVALUATION

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. The three others are on sources of industrial growth and structural change: one is designed to organize 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.

A definite evaluation of the relevance and impact of the projects is not possible at this stage, as most of the final products have not yet been written. However, one may say with confidence that, 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 visions of the world; competence is undisputable.

There is one important lesson to be learned from the failures. The WB research group has some difficulties in dealing with outside consultants. The trouble seems to lie in that the conceptualization of the projects is done in detail within the Bank. Then, outside practitioners are expected to do high quality research on these topics, without close monitoring of the WB people. It cannot work. Either the consultants are good enough researchers to share the conceptualization stage, or they should be handed clearly designed tasks, to be performed under the supervision of the people responsible for the projects.

Expertise in promoting joint research ventures with outside consultants seems to be lacking. Perhaps the Ford Foundation format of first designing broad terms of reference and then submitting these to an open international competition should be used, as a supplement to the present procedures of hiring outside consultants.

### 4. FUTURE RESEARCH

The studies of sources of growth on the demand side are nearing completion. Further accounting exercises of this type do not seem to be necessary. But one still would want to see additional analytical work on a framework of analysis that articulate "the connections between individual policy instruments, changes in industrial structure, and economic performance". The purpose would be to develop a kit of tools for development economics similar to that already available for short-run macroeconomic policy-making. It is not clear that the Bank is better equipped than the academia to do this type of research, but the policy need is evident in the LDCs for such an analytical effort.

For reasons that were already mentioned, we do not think that it would be advisable to expand the project on sources of growth from the supply side beyond its present size. From the perspective of industry and trade, we also consider questionable the allocation of large sums of money to further research on general equilibrium models. Some work of this type should always go on to keep the WB researchers in contact with the state of the art in academia. Also, perhaps general equilibrium models may be found more useful for general policy analysis outside the scope of the panel's review.

In spite of the failures of the projects on the export prospects of labor intensive manufactured products from LDCs, we consider that this is a promising line of research. Perhaps/a good candidate for testing the proposed system of open international competitions for research projects, to be sponsored by the WB.

New research lines that the Panel considers advisable to explore are discussed in detail in Chapters 1 and 2 of the report.

3.3

Jae-ik Kim

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Revised Draft  
March 1978

Evaluation of World Bank Research on Trade and Industrial  
Development:

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

The Subject - Overall Comments

1. One of the recent developments in international trade is that a growing number of countries, mostly middle income countries which have been recipients of Bank loans, have become exporters of manufactured goods to developed countries. Typically, these countries moved away from import substitution policies and promoted exports of manufactures, particularly labor intensive light industrial products. Such development strategies, however, brought a reaction from many developed countries, which began to restrict the new exporters' access to their markets.

The twelve studies reviewed signify an important step towards a solution of this problem that could very well develop into a political issue gravely undermining the Bank's role as a development institution. What follows is a review of these projects. Most of these contain materials falling within the following three categories: 1) surveys of selected industries, data compilations, analyses of commodity markets or the overall environment of trade; 2) problems concerning

import restrictions by the DCs on the LDCs' manufactured goods (the reverse problem, and that of obstacles to inter-LDC trade are given little attention); and 3) national policies and the role of institutions in promoting trade in the LDCs.

2. One immediate problem is that the Bank has a very narrow definition of research, so that the projects solely in category one are not strictly speaking included. As a result this extremely valuable work has to be conducted under exceptionally difficult conditions with a totally inadequate allocation of manpower. It is only natural that there are more problems in this area than any other.

It cannot be stressed too highly how valuable this sort of study is to developing country policy makers. Even countries like Korea, with relatively sophisticated research institutes can only easily learn of their relative position in world markets through this sort of work. From the point of view of developing countries it is strongly recommended that this category of research be given a higher status in

1)  
the Bank.

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- 1) Some of the remarks made may seem harsh to the staff concerned who know that if more time or manpower had been available, the faults could have been avoided. Where this is the case they should understand that all this criticism is essentially a commentary on the management which deprives them of adequate resources to do their job with optimal efficiency. If the remarks given below seem critical it is also because of the very high standard of research one has come to expect from the Bank.

All but four of the papers were ongoing projects and only drafts and proposals were available for review. The three finished works, by Balassa, Hughes and Sharpston were of notably higher quality, and since this report was originally drafted there have been further improvements in the other projects.

### Review of Projects

3. Plesch's study of "Developing Countries' Exports of Electronics and Electrical Engineering Products", which was compiled over a few months, presents a survey of the remarkable growth of electronics exports by eight newly industrializing countries (NICs) to the United States. It will be useful if it is kept up to date. At present production data is only given to 1973 and exports to mid-1977. In view of the recession of 1975 it is too early to judge how far the trend has been interrupted. It does provide a useful jumping off point for serious research, but it could have been improved as an intermediate product by additions to the policy section and by incorporating some of the observations of Sharpston.

4. Keesing, Plesch and Triner's unfinished survey entitled "Developing Countries' Exports of Textiles and Clothing: Perspective and Policy Choices" has an excellent summary which

also deals with the Multi Fiber Agreement complexities in a lucid fashion, and advocates the desirability of a shift to LDCs of textile manufactures. In textiles and clothing, as in electronics, the dominance of a few countries is apparent. The authors raise the interesting question of windfall gains resulting from quotas but unfortunately, due to restrictions on this type of research, can offer only "speculative inferences from unsystematic observations" concerning this aspect. As far as the policy choices section is concerned the recommended policies could have been more clearly differentiated. Policies recommended to the firms in textiles and clothing, which assume no changes in the policies of the importing countries regarding either quota or tariff, should be distinguished from policies which take into account the impact on the importing countries' policies of any expansion of exports. Also, policy choices for government have to be comprehensive, and their successful implementation requires close cooperation with the exporting countries.

5. Keesing and Plesch's work "Recent Trends in Manufactured and Total Exports from Developing Countries" is essentially a commentary to a set of tables and was compiled in less than a week. It is invaluable as a reference work, but has a rather limited lifetime unless updated every year. It is understood that it has subsequently been revised. Again what

emerges is that 8 NICs enjoy 76% of manufactured exports from LDCs. If more research time were available, could not more resources be given to investigating unsuccessful countries in all the above studies?

6. Morawetz's study (RPO 671-56) on "Marketing Manufactured Exports" was intended as an analysis of the institutional and non-price aspects of the growth in that trade from Colombia. In fact in a recent seminar Morawetz has shown that this growth was not as remarkable as was first thought. It is not clear how useful this study will be for countries which hope to expand their clothing exports to developed markets, and it may prove that the selection of another country would have been more appropriate.

7. Baldwin's proposal "The Effects of Increased Imports of Manufactured Goods from Developing Countries in the United States" (RPO 671-67) and Waelbroeck and others' "The Effects of Increased Imports of Manufactured Goods from Developing Countries in Europe" (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 also proposes to study the role of the EEC in trade restrictions in the future. These proposals hold good promise and are to be joined by a study on a similar basis of Japan and other Pacific countries which was not offered for review.

Although much has been written about the economic impact of 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 on protectionism. Protectionism and its successful reflection in government policies is believed to be a function of a 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 originally proposed to measure 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 politico-economic causes will be studied, while both projects will provide empirical analyses of the structure of protectionism.

8. It is not possible to review these projects satisfactorily since they have so far produced no concrete results. A recent paper by Balassa entitled 'The Market Penetration Studies Approach and Methodology' sets out standards for methodology and comparability which suggests that, after the usual problems where a number of outside consultants are involved, the Bank is pulling these projects into a clear and thoughtful shape.

Recent reports suggest that close cooperation with the EEC will in the end produce some very useful results.

9. "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 a reform of the incentive system. This project is of the greatest relevance to operational staff and to policy makers. It is precisely the sort of work the Bank should be doing. Its grasp of methodology at the initial stages is much clearer and appropriate than either Waelbroek or Baldwin at a comparable stage, and its potential pay-off for developing countries may even be higher.

10. Seen from the same perspective, Keesing and Wortzel's proposal "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 tool for exporters of consumer goods to the U.S. market.

This project explains the relevance of a number of the surveys previously reviewed. It frankly admits many of the criticisms a reviewer might make of those other projects (p. 4) in that 'in predicting or projecting manufactured exports, areas of uncertainty (and plain ignorance) are also evident in World Bank operational work on manufactured exports, and in the work of the team proposing this research'.

11. Sharpston's study of "International Sub-contracting" is an excellent piece originally printed outside the Bank. Although presumably written in 1974 the quality is such that the analysis is still of great value. He answers questions raised by other writers, or suggests lines of approach which have not been taken up. The check list of tasks suitable for sub-contracting is one of the most valuable short pieces

of analysis. Perhaps the mixed background, part academic, part World Bank, provides the perfect balance.

12. On the other hand Wall's "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 and was never published. Nevertheless in terms of results it was not a total failure. It contributed to a series of Bank reports on India which were influential at the time in changing India's policy on exports and export incentives. The critical tone of the report itself prevented it from being published in India, but although opinion within the Bank is divided, it is understood that it has been influential in other ways, not least through training local researchers who have subsequently gone on to assist in policy formulation. This suggests that even where the end product is faulty, the conducting of intensive research with the assistance of local scholars may still serve a useful purpose.

13. The editor, Helen Hughes, 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 on employment, social policies, and investment in the developed countries were 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.

14. 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

abandon gradually 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.

### Overall Evaluation

15. In the past, Bank-financed research has been well respected for the quality of information on specific problems or situation. The country reports and industry surveys have 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 ongoing 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.

16. One would therefore have expected the Bank to have evolved a satisfactory system of rapid data collection and assimilation. But if we consider the three categories of surveys, data compilations and analysis; problems concerning import restrictions; and national incentive policies and the role of institutions: it is with regard to the research projects in the first category that the research department seems to have

most problems. As stated in paragraph 2, the reason for this is the narrow definition of research within the Bank. Given that this category of research, with the Bank acting as a residual supplier of information, is so important not only to LDCs, but also the whole economic community, it is hoped that more resources will be allocated specifically to this type of research. Even so, this will not bridge the gap between research and operational staff. Still less will it solve the problem of effectively using the data collected by the Bank, UN and IMF. It should also be recognized that improving the quality and speed of data reporting by LDCs should be a joint task for these three institutions and would be a major contribution to our understanding and analysis of the development process.

17. Turning to category two, the question of restrictions on trade by developed countries, it is not clear whether this lies within the Bank's comparative advantage. However it has to be recognized that these restrictions could do more to upset the evolution of LDCs' economies than any other action. The effect of these restrictions is to tend to undermine the relevance of both the brilliant general theory of comparative advantage stages of development and specific studies on the income elasticity of manufactured exports from developing countries. The fundamental causes of protectionism need to be better understood and developing countries and various lending agencies that must

predict the expected return on investment in manufacturing for exports need to tackle this problem. The next stage would be to analyse which forms of protectionism have the most serious and detrimental effects on LDCs.

18. Turning to category three, it is here that the Bank has a clear comparative advantage. The relevance and application of the results of such research to the Bank and policy makers are clear and there is little doubt that only the Bank could pursue this line. It is noticeable that the methodology and general approach is much clearer in the proposals of Balassa (RPO 671-35) and that by Keesing and Wortzel (RPO 671-68) than in the others submitted for review. One hopes that the general surveys in category one will be kept updated in the interest of these projects which they are clearly intended to service.

#### Possible Directions of Future Research

19. Judging by the project descriptions, more research could be commissioned on several new areas that so far seem to have escaped professional scrutiny. Some of these proposals technically fall outside the Bank's definition of research. The Bank should probably reconsider its rigid boundaries and whether they really lead to optimal efficiency. Restrictions on market access for manufactured exports from

developing countries, which are expected to intensify, will increase the need to monitor protectionism in industrialized countries and their adjustment policies. The same trend will encourage further research on manufactured trade between developing countries. In connection with this, the Bank might initiate a series of research projects on the feasibility of industrial cooperation between developed countries and NICs with an eye on positive adjustment through intra-industry specialization. At the same time, as suggested above, an analysis of which forms of protectionism have the most serious and detrimental effects on LDCs would be most useful.

20. With regard to export promotion policies, considering the importance of socio-cultural factors which affect a country's entrepreneurship and which vary a great deal from one country to another, it is essential that each country identify major inhibiting factors in advance that might otherwise render the transplanting of promotion policies ineffective, and then devise methods which will circumvent them. Furthermore, LDCs, whether NICs or not, may have to adopt a new perspective on access to markets. The Bank can assist LDCs by launching projects on trade restrictions placed upon each other by NICs. Trade potentials of developing countries in general need to be assessed, not on the basis of past performance records, but on their future possibilities, before the trade barriers can be traded off between developing countries.

### Chapter III.3

Evaluation of World Bank Research on Trade and Industrial Development:

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

#### The Subject-Overall Comments

1. One of the recent developments in international trade is that a growing number of countries, mostly middle income countries which have been recipients of the Bank loans, have become exporters of manufactured goods to developed countries. Typically, these countries moved away from the import substitution policies and promoted exports of manufactures particularly labor intensive light industrial products. Such development strategies, however, brought a reaction from many developed countries, which began to restrict the new exporters' access to their markets.

The twelve studies recently commissioned by the Bank signify an important step towards a solution of this problem that could very well develop into a political issue gravely undermining the Bank's role as a development institution. What follows is a review of these projects. Most of these contains materials falling within the following three categories: 1) surveys of selected industries, data compilations, analyses of commodity markets or the overall environment of trade; 2) problems concerning import restrictions by the DCs on the LDCs' manufactured goods (the reverse problem, and that of obstacles to inter LDC trade are given little attention); and 3) national policies and the role of institutions in promoting trade in the LDCs.

2. If the remarks given below seem critical it is because of the very high standard of research one has come to expect from the Bank. All but four of the papers were ongoing projects and only drafts and proposals were available for review. The three finished works, by Balassa, Hughes and Sharpston were of notably higher quality. Many of the criticisms levelled at the unfinished projects are doubtless ones which the authors are already in the process of correcting.

#### Review of Projects

3. Plesch's study of "Developing Countries' Exports of Electronics and Electrical Engineering Products" presents a survey of the remarkable growth of electronics exports by eight newly industrializing countries (NICs) to the United States. It will be useful if it is kept up to date. At present production data is only given to 1973 and exports to mid-1977. In view of the recession of 1975 it is too early to judge how far the trend has been interrupted. It does provide a useful jumping off point for serious research, but it could have been improved as an intermediate product by additions to the policy section and incorporating some of the observations of Sharpston.

4. Keesing, Plesch and Triner's survey entitled "Developing Countries' Exports of Textiles and Clothing: Perspective and Policy Choices" has an excellent summary which also deals with the Multi Fiber Agreement

complexities in a lucid fashion, and advocates the desirability of a shift to LDCs of textile manufacture. In textile and clothing, as in electronics, the dominance of a few countries is apparent. The authors raise the interesting question of windfall gains resulting from quotas but unfortunately, offer only "speculative inferences from unsystematic observations" concerning this aspect. As far as the policy choices section is concerned the recommended policies could have been more clearly differentiated. Policies recommended to the firms in textile and clothing, which assume no changes in the policies of the importing countries regarding either quota or tariff, should be distinguished from policies which take into account the impact on the importing countries' policies of any expansion of exports. Also, policy choices for governments which are willing to go through industrial adjustment have to be comprehensive, and their successful implementation require close cooperation with the exporting countries.

5. Keesing and Plesch's work "Recent Trends in Manufactured and Total Exports from Developing Countries" is essentially a commentary to a set of tables. It is invaluable as a reference work, but has a rather limited lifetime unless updated every year. (The commentary could be improved as there are considerable discrepancies between the figures given for the share of the U.S.A. in LDC manufactured trade on p. 3, Table 13 and Annex A-3 -- at least one of these must be a misprint). Again what

emerges is that 8 NICs enjoy 76% of manufactured exports from LDCs. In all the above studies, could not more attention be given to less successful countries?

6. Morawetz's study (RPO 671-56) on "Marketing Manufactured Exports" could be valuable to countries which hope to expand their clothing exports to developed markets. An analysis of the institutional and non-price aspects of the phenomenal growth in that trade from Colombia should produce useful knowledge on marketing problems which are the key to success.

7. Baldwin's proposal "The Effects of Increased Imports of Manufactured Goods from Developing Countries in the United States" (RPO 671-67) and Waelbroeck and others' "The Effects of Increased Imports of Manufactured Goods from Developing Countries in Europe" (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 also proposes to study the role of the EEC in trade restrictions in the future. These proposals hold good promise and are to be joined by a study on a similar basis of Japan and other Pacific countries which was not offered for review. Although much has been written about the economic impact of 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 on protectionism. Protectionism and its successful reflection in government policies is believed to be a function of a 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 will measure 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 politico-economic causes will be studied. Both projects will provide empirical analyses of the structure of protectionism.

8. Of these two proposals for separate projects on the same theme, Baldwin's original project proposal was very extensive and without a clear connection between the two parts. It remains a very ambitious project setting out to uncover the 30 years history of protectionism in the U.S.A., including political pressure on congresspersons, as well as market penetration. One assumes that this project will change fairly radically as it is pulled into line with the other project and possible lines of research and methodology are identified. Waelbroek's proposal was even more vague and at the same time there was a lack of comparability with Baldwin's project. The review of research in progress was very poor. Even when completed, proposed changes within the EEC to admit three low

income European countries could make the results of limited value. A recent paper by Balassa setting out standards for methodology and comparability overcomes a number of these objections.

9. "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. This project is of the greatest relevance to operational staff and to policy makers. It is precisely the sort of work the Bank should be doing. Its grasp of methodology at the initial stages is much clearer and appropriate than either Waelbroek or Baldwin, and its potential pay-off for developing countries is likely to be much higher. In view of the importance of this topic, might not more resources have been applied to more country research, including a country that has tried to apply all the right measures, but failed to achieve spectacular success?

10. Seen from the same perspective, Keesing and Wortzel's proposal "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 tool for exporters of consumer goods to the U.S. market.

11. This project explains the relevance of a number of the surveys previously reviewed. It frankly admits many of the criticisms a reviewer might make of those other projects (p. 4) in that 'in predicting or projecting manufactured exports, areas of uncertainty (and plain ignorance) are also evident in World Bank operational work on manufactured exports, and in the work of the team proposing this research'. The study concentrates on key institutions in marketing, which is the serious bottleneck for most LDCs. At the proposal stage the project seems very oriented towards the U.S.A., and while there is a justification for this in view of the importance of the U.S. in LDC trade, it looks as though the research department lacked a European dimension. In addition the proposal admitted an overlap with other projects. It is not immediately clear why all these projects were not part of the same single coordinated project, unless the research department suffers from managerial problems.

12. Sharpston's study of "International Sub-contracting" is an excellent piece originally printed outside the Bank. Although presumably written in 1974 the quality is such that the analysis is still of great value. He answers questions raised by other writers, or suggests lines of approach which have not been taken up. The check list of tasks suitable for sub-contracting is one of the most valuable short pieces of analysis. Perhaps the mixed background, part academic, part World Bank, provides the perfect balance.

13. On the other hand Wall's "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.

14. The editor, Helen Hughes, 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 on employment, social policies, and investment in the developed countries were 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.

15. 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.

### Overall Evaluation

16. If we consider the three categories of surveys, data compilations and analyses; problems concerning import restrictions; and national incentive policies and the role of institutions: it is with regard to the research projects in the first category that the research department seems to have some problems. 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 have 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. One would expect the Bank to have evolved a satisfactory system of rapid data collection and assimilation. This expectation is not met, for it would appear that some of the researchers are heavily reliant on the U.N. Statistical Office which does not supply the necessary information fast enough; in particular domestic production statistics seem to be five years behind events and appear in a form that does not match trade classifications. Although the Bank's main purpose is not to collect data, it would seem that there might be room for improvement particularly in information flow between the research staff and operational staff.

17. Turning to category two, the question of restrictions on trade by developed countries, it is not clear whether this lies within the Bank's 'comparative advantage'. However it has to be recognized that these restrictions could do more to upset the evolution of LDCs' economies than any other action. As Douglas North has recently pointed out, neo-classical market analysis 'can only survive under the highly restrictive assumption that the costs of using the political system to alter the market structure are prohibitive' (Journal of Economic Literature, XVI, (Sept 1978), p 971.) If this is the case, then both the brilliant general theory of comparative advantage stages of development and specific studies on the income elasticity of manufactured exports from developing countries will have limited practical relevance. The fundamental causes of protectionism need to be better understood and 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.

18. Turning to category three, it is here that the Bank has a clear comparative advantage. The relevance and application of the results of such research to the Bank and policy makers are clear and there is little doubt that only the Bank could pursue this line. It is noticeable that the methodology and general approach is much clearer in the proposals of Balassa (RPO 671-35) and that by Keesing and Wortzel (RPO 671-68) than

in the others submitted for review. One hopes that the general surveys in category one will be kept updated in the interest of these general projects which they are clearly intended to service.

#### Possible Directions of Future Research

19. Judging by the project descriptions, more research can be commissioned on several new areas that so far seem to have escaped 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. In connection with this, the Bank might initiate a series of research projects on the feasibility of industrial cooperation between developed countries and NICs with an eye on positive adjustment through intra-industry specialization.

20. 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 capital goods in developing countries, and (4) payment problems that are unique to developing countries.

21. On a similar scale, the Bank might perform a valuable technical assistance to a number of countries in South Asia, Middle East, and Africa which are interested in adopting export promotion policies based on incentives that had been tried successfully by NICs. Considering the importance of socio-cultural factors which affect a country's entrepreneurship and which vary a great deal from one country to another, it is essential that each country identify major inhibiting factors in advance that might otherwise render the transplanting of promotion policies ineffective, and then devise methods which will circumvent them. Furthermore, LDCs, whether NICs or not, may have to adopt a new perspective on access to markets. Since the main cause of the new protectionism lies in the internal political arena of individual developed countries, which are by and large beyond the LDCs' ability to change, they must look toward themselves for trade expansion. The Bank can assist LDCs by launching projects on trade restrictions placed upon each other by NICs. Trade potentials of developing countries in general need to be assessed, not on the basis of past performance records, but for their future possibilities, before the trade barriers can be traded off between developing countries.

22. Another neglected area is the service sector. Telecommunications, shipping, banking, and insurance, for example, have been considered even by developing countries to be the exclusive zone for developed countries. Research on the trade expansion effect and balance of payments impact on developing countries are not carefully studied yet.

23. An overall criticism of the papers submitted for review was a certain lack of appreciation of living within a historic process and not in a timeless economic world, and also a lack of differentiation between a small group of successful NICs and the larger group of LDCs. All the authors show some awareness of these problems but few spell them out very plainly. A few instances can be given; current price data rather than constant price data is often used. Authors may protest that this adds a further complication, but it adds a very important dimension. Similarly in much of the work on manufactured imports and protection there seems an inadequate discussion of the degree to which all LDCs live in the shadow of Japan's success. Without analysing the ongoing trade barriers to Japanese manufactured exports, the present situation affecting LDCs can hardly be understood. It might be that that the Bank research staff could benefit from a full time historical advisor.

RESEARCH PROJECTS ON INDUSTRIAL DEVELOPMENT  
AND TRADE

Market Access; Export Promotion Measures

<u>Project No.</u>	<u>Project Title</u>	<u>Responsibility</u>	<u>Date of Approval</u>	<u>Date of Completion</u>
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

1. Kessing, D. and Plesch, P., "Recent Trends in Manufactured and Total Exports from Developing Countries", June 6, 1977.
2. Plesch, P., "Developing Countries' Exports of Electronics and Electrical Engineering Products", February 14, 1978
3. Keesing, D., Plesch, P., and Triner, G., "Developing Countries' Exports of Textiles and Clothing: Perspective and Policy Choices, "May 31, 1978.
4. Balassa, Bela, "World Trade and the International Economy: Trends, Prospects and Policy", World Bank Staff Working Paper No. 232.
5. Sharpston, M., "International Subcontracting", March 1975, World Bank

Appendix: Checklist of Questions

1. What has been learnt? In 5 cases the work merely summarized existing knowledge though in two of these cases so brilliantly as to advance theory and practice. One was a clear failure, the other six should greatly advance knowledge if completed satisfactorily.
2. In all cases knowledge was being transmitted, but in several cases it was not clear that the authors had read one another's papers.
3. a) i. The influence on lending policy is likely to be limited in all but one case.  
ii. In 6 cases policy advice could be improved, in two other cases the policy advice relates more closely to DCs.  
b) All studies will contribute to knowledge of the development process, but in several cases this could be of historic interest.  
c) With respect to the LDC's national policies 4 will directly assist, in several other cases these sections were the weakest.
4. Excluding surveys the Bank has engaged in basic research.
5. The effect on operating people is difficult to judge.
6. In all respects the involvement of LDCs was rather low.

Truthful answers would be

- a) Virtually nil;
- b) Surprisingly low except for the export incentive study;
- c) Negligible;

7. The choice of consultants was not clear. Both Waelbroek and Keesing's proposals showed a lack of European contact. In several other papers a bias towards using U.S. data was apparent. In most cases there might have been opportunities to use LDC scholars. One feels a great deal of sympathy for Professor Bacha's suggestion of having open competitions for researchers rather than consultancy by invitation.
8. a) In 3 cases the mix of theory and empirical research was excellent, in others it was much less clear.
- b) The degree of policy orientation of research really depends on the quality of the sections which make policy recommendations and the degree to which the research staff consult with operational staff and LDC policy makers in drawing up the framework for the project.
- c) The choice of problems was reasonable.
- d) The assessment sometimes lacked a sense of being part of a historical process. Information gathering was important, but the outsider might have an unjustifiable expectation of a higher achievement.

9. The criteria on which the Bank chose its projects were not always clear when outside consultants were the main formulators.
10. a) Size of research: given finite resources there would certainly seem to be other projects which might be more profitable, and some of the work, for instance, the access to markets in DCs might have been performed by outside institutions.
- b) The composition of the research on fields, problems and methods within the limits of the replies to other answers was good.
- c) This is very unclear, and possibly as suggested in 7 unsatisfactory. What is the Bank's experience of contracting with institutions like the Brookings or comparable national foundations rather than individuals?
- d) This again appears unsatisfactory. Drafts appear to lie around getting outdated. How thoroughly do researchers and operational staff interact?
- e) How to use 'outside' knowledge and resources better?  
It would appear that the 'in-service' infrastructure is not adequate to the Bank's needs and there is no evidence of other institutions collaborating to produce data rapidly (apart from the pre-release of UN tapes).
- f) i. Certainly the Bank should be a knowledge bank.  
ii. This is difficult to judge; perhaps the best answer is 'to the extent that the operational staff fulfill the needs of all LDCs'.

- g) There might be room for improvement here; while nationals may not be the best and most candid judges of their own nations there is a lot of scope for sending economists from LDCs to other LDCs.
- h) This depends on the resources, the loads on current staff, etc. One possibility might be a form of visiting fellowship in which academics from LDCs are employed for a year as research fellows combining outside and inside virtues?

3.4

Introduction

1. The following discussion treats each of the various subjects in a separate manner, although it could be argued that they are, in some sense, interrelated. It rests on the analysis of five RPO projects and two non-RPO projects, which are mentioned in Annex I, as well as in other relevant documents.
2. The themes are important for the Bank from the operational angle. They appear in the fora of discussion and, in particular, within the LDC's, where it seems important to have a better understanding of the problems involved for policy formulation. Progress in research in these areas by the Bank will allow it to increase its capacity to give meaningful and relevant policy recommendations.
3. The quality of research done by the Bank in these areas is, in general, relatively high in comparison with research done by other bodies. Nevertheless it should also be mentioned that the level is below the standards attained by the Bank in other areas or by certain academic circles. One also notices that a good part of the research effort in some fields, notably credit imperfections and public enterprises, appears to put too much emphasis on the experiences gained by one country (India).
4. Several reasons might explain the situation described above. We should note in the first place that all of these areas of research are relatively "new ones for the Bank. Therefore, in this case the Bank as yet has neither the experience nor the influence in policy recommendations that it has gained in other research areas. (Although, according to the operations people, borrower countries frequently demand Bank advice for just this type of situation.) Secondly, it seems that those responsible for these projects do not have the same intellectual leadership that one finds in other areas of Bank research.
5. However, it should be stressed that in no way does it mean that the quality of the research is low. It should also be kept in mind that many of the projects have not been finished and, in some cases, they are still at the conceptual stage. In any case, it appears obvious that they are promising areas of research and that to have more solid bases for policy recommendations it will also be necessary for the Bank to consider an intensification of its research efforts in these fields.

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\*This section has been drafted by Gerardo M. Bueno.

Small enterprises

6. Research on small enterprises has been to a large extent the result of a growing interest in the Bank in these questions at the policy formulation and the operative levels. Not only does one find a sectorial policy paper (Employment and Development of Small Enterprises); the subject is also frequently referred to in the latest Bank's annual reports and in the President's addresses to the Board of Governors.\* Accordingly, and although the subject does not fall squarely within the Bank's traditional lines of research, the decision was taken to support it. Thus, this appears to be one instance where the need for operative and policy formulation determined to a large extent the opening of new lines of research.
7. In other places, too, the subject is very much in vogue on account of the relations that would appear to exist between small scale enterprises (SSE's) development and the growth of employment. SSE's have become fashionable not only in international and regional organizations but also on the national level in both developed and underdeveloped countries. However, it can validly be affirmed that up to now this interest has manifested itself mainly through the formulation of programs to support SSE's and in the adoption of several specific measures to that end; on the other hand, little has so far been done in terms of policy formulation in the context of a global strategy. In short, the emphasis has been placed more on action than on reflection. Research, on the other hand, has tended to be descriptive and of a general character as well as repetitive.
8. The approach taken by the Bank is more original and appears to be more promising. In fact, it is to a greater extent in accordance with a view that considers development very much as a dynamic process that involves innovation, imitation, learning and competition in a Schumpeterian sense rather than as a movement towards competitive equilibrium. The possibility of falling into some pitfalls in following this approach is by no means negligible; but nevertheless it is the right approach and what may be suggested here is that the Bank should be more explicit about it. (This would entail, for example, more research than has been done in the past on the dynamics of SSE's.)
9. Research by the Bank in this area started more intensively with the RPO 670-77 project (Financing of Small Scale Industries); in addition there were two other non-RPO projects on Brasil and one on Malaysia. The two non-RPO projects on Brasil are economic research of good quality the main conclusions of which were that the SSE's sector had lost in relative importance and that new SSE's had tended to concentrate on the growth poles of

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\*The Bank's position in relation to these questions is summarized in its latest annual report: "The Bank has found that the benefits of growth cannot be assumed to "trickle down" automatically; to ensure that development benefits the poorest it must be deliberately directed to the poorest --- (thus) --- financing for industrial development (should) shift towards small scale enterprises".

South East Brasil. Therefore, recommended (something that the Braziliens were already doing) the formulation of support programs for SSE's giving special attention to geographical distribution. The conclusions, as can be seen, were not particularly different from those reached in similar studies.

10. RPO Project 670-77 was a low cost undertaking through which the Bank aimed, for the first time, at having an overall view of the importance of SSE's in different economies. The results were afterwards discussed within the Bank and, in the opinion of some, particularly in the research area, it was thought a waste of time and considered that "a 2-4 days meeting would have been preferable". Finally the decision was taken to support its main recommendation to continue doing research on these questions; but this highlights the risks that can be run when research competence does not come up to the standards that have been set elsewhere in the Bank.
11. The follow up was RPO project 671-59 (Small Scale Enterprise Development). The formulation of the project owes much to Ian Little, as well as to D. Anderson and L. Westphal, and to their dissatisfaction with the type of research that was being done, and in particular with the absence of ways and means that would allow the evaluation of different policy alternatives. The project has two main objectives. On the one hand, a review of the existing information and literature on small enterprises in developing countries and, through trial surveys, an attempt to define ways in which the information can be improved. The other, which should be the most interesting at medium term, is to develop a basis for assessing the impact on income and employment of various policy options and an attempt to estimate the costs and benefits of various policies to small enterprises.
12. The first phase of the project includes a review of the literature as well as case studies and enterprise surveys. The studies will cover India, Colombia, Philippines, Japan, Korea, Taiwan, Nigeria, and the enterprise survey India and Colombia. From this point of view, one could say that the investigation has a good approach and that it will contribute to the diffusion of knowledge through the participation of researchers from developing countries. However, it would have been desirable to include a larger number of countries, taking advantage of the increasing interest in the subject. It is true that later on difficulties would have arisen in regard to data handling and coordination of the project, but it also seems true that the advantages would have been superior.
13. RPO 671-59 was started in November 77 and the first phase is expected to be completed by September 79. Three papers have already been completed, two of which touch mainly upon methodological questions and the third one presents in draft from the preliminary results of the small and medium scale enterprises survey in Colombia.

14. On the methodological side the first two papers cover, respectively, the problems that SSE's face in the credit and financial markets and in regard to technological development. The first one has made use, though to a limited extent, of research carried out elsewhere in the Bank on credit market imperfections, and the second of some of the work done in the area of capital labor substitution. Both of them present suggestive approaches and, more particularly, in relation to the distortions in LDC's economies which SSE's must face.
15. A lot of work remains to be done and it is difficult at this stage to provide an evaluation of the whole project. Nonetheless, some insights into the possible outcome are provided by the draft paper presented on SSE's in Colombia for three sectors (producers of pumps and compressors, producers of agricultural implements and producers of cookers and ovens); although the authors emphasize again and again the partial and preliminary character of the results therein presented. But, however preliminary they might be, they show that it is not only a valid subject of research for the Bank, but also a worthwhile one in which to increase the efforts. The survey presents a good discussion as to the main characteristics of the SSE's, the origin of the firms and the entrepreneurs, their technological adaptations, their problems vis-a-vis the labor and financial markets, etc. But this said, it also shows very clearly that there are at least three areas where further thought is strongly required. The first one is factor productivity and especially in regard to the different combinations of capital and labor; the second is the overall question of technology selection, utilization and adaptation as well as the learning process; and finally, the overall effect of economic policies on the development of SSE's. The first two are frequently mentioned in the Colombian paper, while the latter is seldom referred to. But it is an important one and perhaps we could expect that at a later stage its significance will be more explicitly presented once research in this third area has progressed. It must also be taken into consideration, just as is mentioned in other Bank papers, that many of these distortions that affect SSE's have their origin in the economic policies followed by many of these countries. (And it is clear that there is a role for the Bank to play in ascribing the responsibility for many of these distortions to where it rightly belongs.)
16. Lastly, in this section we will mention some of the problems that have surfaced during the actual carrying out of the research. Here, however, only general impressions will be put forward since it is difficult to be more precise in the absence of more detailed information. Amongst them perhaps the most important is the absence of an overall encompassing methodology, such as was provided for example in the case of the incentive studies and others. Although it can be argued that the development of just such a methodology is the result of an iterative process, further work could be heavily affected by the lack of it. Secondly, and perhaps more important at this state, is that the number of participating researchers seems to be relatively small especially in comparison with the aims of the project.

Credit markets

17. In this area we find two RPO's, one of them (671-65) on "Small Enterprise Financing", and the other (671-64) on "Market Imperfections and Economic Developments", both of them under the responsibility of the Public and Private Finance Division. The discussion that follows also took into consideration a paper prepared by this Division (Domestic Finance Studies number 43) presenting its research program. At the outset, however, it must be pointed out that in this case some of the papers provided do not attain the quality levels which prevail in other areas of Bank research.
18. RPO 671-66 has not, as yet, any relevant paper. We have, therefore, only a research proposal to study the role of informal credit markets. The project is justified on the basis of the importance of those informal credit mechanisms for financing small enterprises and trade in various Asian and African countries. It is suggested that the studies could serve to ascertain whether the real cost of lending in this market is significantly lower than in the formal financial market and if it is possible to establish some sort of link between the two.
19. A pilot study has been initiated which focuses on "a significant element of the informal credit markets in India, namely the Shroffis". (The Shroffis are indigenous style bankers who extend and create credit through the issue of hundis as well as other credit instruments). Be that as it may, there are nonetheless certain questions that arise in connection with this project and for which adequate answers are so far missing. Perhaps this may be due to lack of time to delve more thoroughly into these matters but nevertheless is it useful to state at least a few of the questions. One of them, of course, has to do with the fact that we are left in the dark as to the significance of these mechanisms from the point of view of financing and allocation of resources. and the other would concern the significance of these questions for the normative aspects of the operations of the Bank. Without aiming to cast doubts on the validity of this research proposal - which in fact did not receive overwhelming support in the Bank - the point that we would like to make here is that special care should be exercised in formulating research in these "new" fields of research in the Bank; least they may be rapidly abandoned in favor of more "proved" lines.
20. RPO 671-69 on capital market imperfections and economy developments owes much to the formulations of Dr. Sen and to previous work that was done in the Division itself. The project was initiated in January 78 and it is expected that the final report will be finished by March 79. Various papers have already been produced; one on "Interest Rate, Transactions Costs and Financial Innovations", another on "Some Theory of the Financial Intermediation in Developed Countries", and one on "Portfolio Determinant of Commercial Bank Earnings in Selected Asian Countries". These were followed by a paper on "Financial Intermediation and Economic Developments: An empirical investigation" and which should be considered as a sister paper to the earlier one on "Interest Rate, Transactions Costs and Financial Innovations". The output, thus, has not been negligible.

21. In the development of the project three types of interests are clearly discernible. The first one is the need that was felt to make an examination of the impact that transaction costs have on lending as well as on borrowing in different markets. This is a subject in which there are obvious gaps in the literature and particularly in relation to the financial systems of LDC's. The second relates to the interest in the possible effects that banking regulations in LDC's may have on the banking structure and in the long-run financial viability of the banks. The third one concerns the need to have a model that would express the possible interaction between the development of capital markets and general economic development. These will be briefly examined in reverse order.
22. The third subject of research is covered by two papers, one of which presents a general model and the other attempts an empirical verification of some of the issues raised in the first one. But the latter, in fact, is more than just an extension of the former. Their aim is to better understand the role that financial intermediation plays in the development process as well as to identify the factors which limit its effectiveness and the benefits which may accrue from improving it. This was justified, on the other hand, by the fact - which seems a valid one - that economic analysis in the past has generated "neither a body of reasonably rigorous theory nor a wealth of credible economic results".
23. The central argument of the model, which does not as yet seem adequately proven, is that for a given production function and state of non-financial technology there is a role to be played by financial intermediaries channeling resources from low to high return sectors, thereby raising the aggregate marginal productivity of capital. The limits on this role have been defined at one end by the overall rate of return which would prevail in the absence of financial institutions and, at the other, by the rate which would prevail when capital markets are perfect.
24. Together with the presentation of the model the papers include a relatively thorough review of the existing literature and, as mentioned above, an empirical verification of a limited version of the model. However, it is obvious that further work will have to be done. One obvious need concerns the nature of the data and also further examination of the results provided by the model. A possible approach could be to take countries not based solely on geographical considerations but taking also into account their level of development and the structure of their economies.
25. Another paper examines the relationship between earnings and portfolio of the commercial banks of three Asian countries: Philippines, Thailand and Singapore. The technique used was that of statistical cost accounting and followed, with some variations, the methodology previously used by Hester and Zoellner. As in other cases the research was also justified on the grounds that analyses of this type are scant in developing countries.

26. The investigation is well conducted and the conclusions are interesting in that both the rate of return on loans and administrative costs seem to be positively correlated with the degree of regulation in banking operations. The lowest figures relate to Singapore which of the countries examined is the one that presents the most competitive financial market and is the least regulated. This is an analysis that undoubtedly can be further refined and extended to a larger number of countries, although we should mention that data problems in several cases will prove to be quite significant.
27. The paper on the relations between interest rate and transaction costs is an interesting one and developed with technical competence. It raises a valid point in calling attention to the importance of transaction costs for the borrower and the lender and thus, in a certain sense, to the need to innovate in the process of financial intermediation. However, the significance of this factor alone is not clear yet. The study previously referred to on banking in the Philippines, Thailand and Singapore estimated the administrative costs of lending on the average at 0.1-0.5, 1.4-2.0 and 0.77 percent respectively. It seems, therefore, that there are other more important factors to take into consideration than only the size of the borrower.

#### Public Enterprises

28. RPO project 671-11 (Managerial Structures and Practices: Public Manufacturing Enterprises), is up to now the only research project by the Bank on this area. It was started in March 78 and it is expected that the final report will be submitted in January 1980. In addition it is also being considered in a certain sense as an extension of some previous work and in particular reconnaissance missions that were previously made to Egypt, India and Yugoslavia. As yet, the only report available is a case study of a public enterprise: India's Swaraj Tractor.
29. The research proposes to examine a set of hypotheses which it is said, "are best described by the general proposition that the performance of public manufacturing enterprises is dependent upon their organizational and managerial structures and practices as well as the policy environment within which they operate". It is justified on the basis of the fact that a large part of the lending operations of the Bank concerns public enterprises and that they are a growing sector in LDC's industries. And, in addition, they are a type of enterprise about which not much is known and where in general, little research has been done.
30. As mentioned before, the only report available up to now is on the Swaraj tractor plant in India. The report is interesting, particularly the point which shows the significance that indigenous technical developments and adaptations had in the shaping of and the improvements in the competitive position of this plant. But one could also say that it does not allow one either to evaluate the overall approach taken by the Bank on this question or to arrive at definite conclusions.

31. In view of this it might appear convenient for the management of the Bank to give more reflection to the research work done in this area. The area itself is of prime importance for the Bank from the points of view of (1) allocation of resources, since a large part of its loans goes to public enterprises and (2) its advisory role to LDC's. It appears obvious that in the absence of a coherent body of thought on these questions there is a great risk for dispersion of the research efforts. This would be unfortunate since it appears to us that on account of its experience and the insights that could be provided by research executed in other areas, it is difficult to think, worldwide, of any institution other than the Bank that could do it.

#### General Evaluation

32. It is quite clear that the subjects pertaining to small enterprises, credit markets and public enterprise, have great relevance for Bank operations and for LDC's. However, it is also clear that here we have a case where relevance is not matched by the research effort actually carried out.
33. There are several factors which could account for this situation. One of them, perhaps, is the fact that in the past the Bank thought that the best way to approach these problems was on an ad-hoc basis through the operational units and, thus, that there was no need to support their actions with a research basis. This is what would account for the additional fact that all these areas of research are relatively "new" within the Bank. Indeed, one could go even further and argue that there was some sort of resistance towards including these and other types of institutional research within the body of research carried out in the Bank.
34. Even now, one can discern the prevalence of two types of attitudes. On the one hand, there is the attitude of considering research on institutional questions as "interesting" but devoid of academic rigorousness and, on the other hand, the attitude towards institutional matters of some researchers who tend to consider other research by the Bank as frequently too academic and of little relevance either to the Bank or, worse, for the real world. This is by no means a unique situation in research institutions, but there is no doubt that, as has been proven by the Bank itself, there is a lot to be gained through a better coordination of efforts.
35. All of this, obviously, is not something that can be attained overnight. But it is probable that a large part of the problem could be solved if the Bank could attract high caliber researchers with solid reputations for this area, just as it did in others. It seems to us, in short, that as yet one does not have in these fields of Bank research the kind of intellectual leadership that prevails in the other more traditional areas of research. The presence of such a leadership would be very useful because it would allow the Bank, on the one hand, to have a better analytical framework to give greater coherence and sense of direction to the

research and, on the other hand, to establish a better working relationship with research in other parts of the Bank and elsewhere. In the absence of this we think that there may indeed be a great risk of either a dispersal of efforts or of conducting research which could be of small relevance for the Bank and for policy formulation. Eventually, this could lead to the gradual abandonment of this type of research. This would be a pity because, as has been emphasized, we think that research in these areas is of significance for Bank operations and for LDCs' policy formulation.

36. One other aspect that we would also like to touch upon is the question of how normative this type of research should be. In our opinion it ought to be high. Through its research the Bank should be able to discern which types of policies and programs for development in a Schumpeterian sense are successful and under what conditions, and likewise which are unsuccessful and why. This, it must be said, is one frequently mentioned objective in the research proposals but which doesn't come across quite clearly in many of the papers under revision. It may be due to the fact that many of the RPO-Projects are still at a preliminary stage and therefore it is not easy, at this moment, to extract this type of conclusion. But, be that as it may, it is nevertheless clear that this is an area where the Bank would be utilizing, to the fullest, one of its comparative advantages in research vis-à-vis other institutions.
37. To finalize this section, we will touch briefly upon some of the more relevant questions put to the members of the panel. Firstly, we would like to stress that many of the papers under revision show a high technical competence. If one does not find in this area the same number of publications in specialized journals that one finds in other areas of research in the Bank, it would be wrong to jump to the conclusion that the prevailing quality standards are much lower in one part than in the other. In fact, there might be a host of factors to explain this situation; one of them, of no small significance, being the short period in which research in this area has been done. It is clear that many of the papers, duly revised, could be amenable for publication in many of these journals. Secondly, as to the usefulness for the Bank of the results from research, it appears to us that, indeed, it should be high once the projects are more advanced. One could go even a step further and say that research of this type is woefully needed by the Bank if it wants to allocate its credit resources more in accordance with a "basic needs" philosophy of development. And this, as the experience of some countries is beginning to show, is by no means an easy task. It must be mentioned also, however, that contrary to what has happened with other research, this might not be - and perhaps should not be - politically innocuous. Thirdly, there are the questions on basic research and on the degree to which research by the Bank duplicated that of other institutions. With regard to the first part, the answer is that there has been some basic research, especially in the area of small enterprises and on the role of financial development in the development process. But our recommendation here would be in favor of more,

rather than less, basic research. There are a number of aspects about which the existing knowledge is imprecise and especially when dynamic factors are taken into consideration. As to the second part of the question it simply doesn't seem that the Bank has duplicated work by other institutions. In practically all RPO's a point has been made to undertake overall reviews of the literature on the different subjects. This has assured to a certain extent that research duplication was avoided. In fact, and to be more precise, far from duplicating, in many cases the research done by the Bank on these topics has been original and pathbreaking. This is the case, for example, in research on SSE's and there are obvious possibilities of doing likewise in connection with public enterprises.

38. As to the impact of research on LDC's, the questions are somewhat more difficult to answer. We would like to start by pointing out that in all RPO's under revision there is participation of researchers from LDC's, though in some more than in others. As to the influence that this may have upon LDCs' policy formulation and relations with the Bank, it is difficult at this time to define what their precise character will be in the future. But the Bank has already quite a substantial experience in this regard and, at least, we think that it will not be substantially different from other experiences; i.e., that if there is substantial interest in the problem under consideration, many of the recommendations filter through to the policy decision-making bodies. Here, our attention does not so much concern the latter question, but rather the already expressed fact that perhaps the Bank from the outset could have widened the scope of some of the studies in order to cover a larger number of countries. There is in many countries a real need to know more and to receive better advice in most of the subjects covered by this chapter. And this is valid even for the Bank itself. We were impressed in our conversations with Bank staff and in reading Bank memoranda of the difficulties that many Bank missions have in answering questions that are frequently posed to them by government officials, such as what should be a sensible policy vis-à-vis public enterprises or SSE's development programs and so forth, and for which up to now only very vague or general answers could be provided.
39. We come now to the question of allocation of resources. Here we can make only two considerations. First, within the area itself, our impression is that it would have been preferable to concentrate most of the resources on SSE's and Public Enterprise, rather than on SSE's and credit markets, as has been the case. To us the former two appear to be more significant from the point of view of the development process, policy formulation and Bank operations. But it could be argued that insufficient factors have been taken into consideration and that the choice reveals personal preferences. Indeed, this may be so. But secondly, and perhaps more important, there is the problem of the financial resources that have been allocated for research in these areas. There is a need to increase them and, in particular, to obtain the concourse and collaboration of highly qualified people.

Recommendations regarding further research

40. The work done by the Bank on capital utilization, capital/labor substitution, SSE's and on technical change itself has provided evidence of the need to undertake more thorough studies of the role that this latter factor, technical change, plays in economic development. This, by the way, coincides very much with a growing preoccupation in many LDC's with the relation between technological development and overall economic development. This preoccupation, in fact, has to do with a number of factors. In the past, for example, it had much to do with the question of negotiating international transfers of technology, but nowadays it is clear that this is only one of the aspects involved and that perhaps more important are the aspects concerning the selection, adaptation and absorption of technology. Likewise, the importance of developing a domestic scientific and technological capability in order to better cope with the problems posed by the development process, particularly for the utilization of renewable and non-renewable resources, is coming more and more onto the fora of discussions. Certainly it is not an easy task but it seems to us that questions of this sort should be covered by research in the Bank.
  
41. It appears that the area of public enterprises has not been sufficiently studied in the Bank or, for that matter, anywhere else. The recommendation was made above for the Bank to essay what would amount to a fresh approach for research in this area. There are many questions here for which answers are, at best, only fragmentary. Amongst them, we should like to point out the relations between public enterprises and the public sector, or with the private sector of the economy or their role in technological development, etc. It is, to a certain extent, a virgin area though its importance for economic policy formulation or for Bank's operations is well recognized.

EVALUATION OF BANK RESEARCH ON INDUSTRY AND TRADE

Small Enterprises; Credit Markets; Public Enterprises

Chapter III.4

Introduction

- 1.- The following discussion treats each one of these in a separate manner, although it could be argued that the different subjects are, in some sense, interrelated. It rests on the analysis of five RPO projects and two non-RPO projects, which are detailed in Annex I, as well as in other relevant documents.
- 2.- The themes are important for the Bank from the operational angle. These themes appear in the fora of discussions and, in particular, within the LDC's, where it seems important to have a better understanding of the problems involved for policy formulation. The progress in the research done in these areas by the Bank will allow it to increase its capacity to give meaningful and relevant recommendations for policy.
- 3.- The quality of the research done by the Bank in these areas is, in general, relatively high in comparison with the research done by other bodies. But, nevertheless it should also be mentioned that the level is below the standards attained by the Bank in other areas or in certain academic circles. Further, one also notices that a good part of the research effort in some fields, notably credit imperfections and public enterprises appears to put too much emphasis in the experiences gained by one country, namely India.
- 4.- There are several reasons that might explain the situation described above. We should note, in the first place that all of them are relatively "new" areas of research in the Bank. Therefore, in this case the Bank has not yet either the experience or the influence in policy recommendations that it has gained in other research areas. (Although, according to the operations people, borrower countries frequently demand the Bank staff for just that type of advise). Secondly, for reasons which aren't yet very clear, except in some cases, it seems that the responsables of these projects do not have the same intellectual leadership that one finds in other areas of Bank research.
- 5.- Those appear to be the two main factors to take into consideration. However, it should be stressed that in no way it means that the quality level of the research is low. It should also be kept in mind that a large part of the projects have not been finished and, in some cases, they are still at the conceptual stage. In any case, it appears obvious that they are promising areas of research and that to have a more solid base for policy recommendations it will also be necessary for the Bank to consider an intensification of its research efforts in these fields.

### Small Enterprises

- 6.- The research on the small enterprises area has been to a large extent the result of a growing interest in the Bank in these questions at the policy formulation and the operative levels. Not only one finds a sectorial policy paper (Employment and Development of Small Enterprises) but also the subject is frequently referred to in the latest Bank's annual reports and in the President's addresses to the Board of Governors.\* Accordingly, and although the subject does not fall squarely within the Bank's traditional lines of research the decision was taken to support it. This appears to be, thus, one instance in which the operative and policy formulation needs determined to a large extent the opening of new lines of research.
- 7.- In other parts also, the subject is very much in vogue on account of the relations that seem to exist between SSE's development and the growth of employment among other things. SSE's have become fashionable not only in international and regional organisations but also on the national level on both, developed and underdeveloped countries. However, it can be validly affirmed that up to now this interest has manifested itself mainly through the formulation of programmes to support SSE's and in the adoption of several specific measures to that effect; on the other hand, little has been done yet in terms of policy formulation in the context of a global strategy. In short, the emphasis has been placed more on action than on reflexion. Research on the other hand, has tended to be a descriptive and general character and, to a certain extent, repetitive.
- 8.- The approach taken by the Bank is more original and appears to be more promising. In fact, they are more in accordance with a view that considers development very much as a dynamic process that involves innovation, imitation, learning and competition in a Schumpeterian sense rather than as a movement towards competitive equilibrium. The possibility of incurring in some pitfalls in following this approach are, by no means, negligible; but never-

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The Bank's position in relation to these questions is summarized in its latest annual report: "The Bank has found that the benefits of growth cannot be assumed to "trickle down" automatically; to ensure that development benefits the poorest it must be deliberately directed to the poorest --- (thus) --- financing for industrial development (should) shift towards small scale enterprises".

theless is the right approach and what may be suggested here is that the Bank should be more explicit about it. This would entail, for exemple, more research than has been done in the past on the dynamics of SSE's; but this belongs more to the recommendations section.

- 9.- Research by the bank in this area started more intensively with the RPO 670-77 project (Financing of Small Scale Industries); in addition there were two other non-RPO project on Brasil and one in Malaysia. The two non RPO project on Brasil are econometric research of a good quality whose main conclusions were that the SSE's sector had lost in relative importance and that new SSE's had tented to concentrate in the growth poles of the South East Brasil. Therefore, recommended (something that the Brazi-liens were already doing) the formulation of support programmes for SSE's giving special attention to its geographical distribution. The conclusions, as can be seen, were not particularly different from those reached in similar studies.
- 10.- RPO Project 670-77, was a low cost undertaking (37 500 dollars) through which the Bank aimed, for the first time, to have an overall view on the importance of SSE's in different economies. The results were afterwards discussed within the Bank and, in the opinion of some, particularly in the research area it was thought a waste of time and considered that "a 2-4 days meeting would have been preferable" to that research project. Finally the decision was taken to support its main recommendation to continue doing research on these questions; but this points well the risks that can be run when research competence does not fit the standards that have been set elsewhere in the Bank.
- 11.- The follow up was RPO project 671-59 (Small Scale Enterprise Development). The formulation of the project owes much to Prof. Ian Little, as well as to D. Anderson and L. Westphal, and to their insatisfaction with the type of research that was being done; and, in particular with the absence of ways and means that would allow one to evaluate different policy alternatives. The project has two main objectives. On the one hand, a review of the existing information and literature on small enterprises in developping countries, and through trial surveys, attempt to define ways in which the information can be improved. The other which should be the most interesting at medium term, is to develop a basis for assessing the impact on income and employment of various policy options and attempt to estimate the costs and benefits of various policies towards small enterprises.
- 12.- The first phase of the project includes a review of the literature as well as case studies and enterprise surveys. The case studies will cover India, Colombia, Philipines, Japan, Korea, Taiwan, Nigeria, and the enterprise survey India and Colombia. From this point of view, one could say that the investigation

has a good approach and that it will contribute to diffusion of the knowledge through the participation of researchers from the developing countries. However, in my opinion it would have been desirable to include a larger number of countries taking advantage of the increasing interest on the subject. It is true that later on some difficulties could have arisen in regards to data handling and coordination of the project, but it seems also true that the advantages would have been superior.

- 13.- RPO 671-59 was started in November 77 and the first phase it is expected that it will be completed by September 79. Three papers have already been completed, two of which touch mainly upon methodological questions and the third one presents in draft form the preliminary results of the small and medium scale enterprises survey in Colombia.
- 14.- On the methodological side the two papers cover, respectively, the problems that the SSE's face in the credit and financial markets and technological development. The first one has made use, though to a limited extent carried out elsewhere in the Bank on credit market imperfections and the second on some of the work done in the area of capital labor substitution. However, it must also be said that these links are not so explicit as it would have been desirable. Both of them present suggestive approaches and, more particularly, in relation to the distortions present in LDC's economics to which SSE's must face.
- 15.- A lot of work remains to be done and it is difficult at this stage to provide for an evaluation of the whole project. Nonetheless, some insights as to the possible outcome are provided by the draft paper presented on SSE's in Colombia for three sectors (producers of pumps and compressors, producers of agricultural implements and producers of cookers and ovens); although the authors emphasize again and again the partial and preliminary character of the results therein presented. And, however preliminary they might be, they show that it is not only a valid subject of research for the Bank, but a worthwhile one in which to increase the efforts. Also, that it is a difficult one. The survey presents a good discussion as to the main characteristics of the SSE's, the origin of the firms and the entrepreneurs, their technological adaptations, their problems vis a vis the labor and financial markets, etc. But this said it also shows very clearly that there are three areas where further thought is strongly required. The first one is factor productivity and especially in regard to the different combinations of capital and labor; the second is the overall question of technology selection, utilization and adaptation as well as the learning process; and finally, the overall effect of economic policies on the development of SSE's. The first two are frequently mentioned on the Colombian paper, while the latter is seldom referred to. But it is an important one and perhaps we could expect that at a latter stage its significance will be more explicitly presented once

that research in this latter area progressed. It must also be taken into consideration, just as is mentioned in other Bank's papers that many of these distortions that affect SSE's have their origin on the economic policies followed by many of these countries. (And it is clear that there is a role for the Bank to play in adscribing the responsibility for many of these distortions where it rightly belongs).

- 16.- Lastly, in this section we will mention some of the problems that have surged up carrying out the research itself. Here, however, only general impressions will be put forward since it is difficult to be more precise in the absence of more detailed information. Amongst them perhaps the most important is the absence of an overall uncompassing methodology, such as was provided for example in the case of the incentive studies or others. Although it can be argued that the development of just such a methodology is the result of an iterative process further work could be heavily affected by the lack of it. Secondly, and perhaps more important at this stage, that the number of participating researchers seems to be relatively small and especially in comparison with the aims of the project.

#### Credit Markets

- 17.- In this area we find two RPO's one of them (671-65) on "Small Enterprise Financing" and the other (671-64) on "Market Imperfections and Economic Developments" both of them under the responsibility of the Public and Private Finance Division. The discussion that follows also took in consideration a paper prepared by this Division (Domestic Finance Studies number 43) presenting its research program. At the outset, however, it must be pointed out that in this case some of the papers provided do not attain the quality levels which prevail in other areas of Bank research.
- 18.- RPO 671-65 does not count, as yet, with any paper. We have therefore, only a research proposal to study the role of informal credit markets. The project is justified on the basis of the importance of those informal credit mechanisms for financing small enterprises and trade in various Asian and African countries. It is suggested that the studies could serve to ascertain whether the real cost of lending in this markets is significantly lower than in the formal financial market and if it is possible to establish some sort of a link between the two.
- 19.- A pilot study has been initiated which focuses on "a significant element of the informal credit markets in India, namely the Shroffis". (The Shroffis are indigenous style bankers that extend and create credit through the issue of hundis as well as other credit instrument). Be that as it may, there are non the

less certain questions that arise in relation with this project and for which there don't seem to be sufficient answer as yet on the research proposal. Perhaps this may be due to the lack of time to dwell more thoroughly on this matters but nevertheless, it is convenient to state at least a few of these questions. One of them, of course has to be with the fact that we are left in the dark about the significance of these mechanisms from the point of view of financing and allocation of resources. The second would concern the significance of these questions for the normative aspects of the operations of the Bank, and so forth. Without aiming to cast doubts on the validity of this research proposal - which in fact did not received an overwhelming support in the bank - the point that we would like to make here is that special care should be exercised in formulating research in these "new" fields of research in the bank; least they may be rapidly abandoned in favor of more "proved" lines.

- 20.- RPO 671-69 on capital markets imperfections and economy developments owes much to the formulations of Dr. Sen and to previous work that was done in the Division itself. The project was initiated in January 78 and it is expected that the final report will be finished by March 79. Various papers have already been produced. One on "Interest Rate, Transactions Costs and Financial Innovations". Other on "Some Theory of the Financial Intermediation in Developed Countries" and one on "Portfolio Determinant of Commercial Bank Earnings in Selected Asian Countries". These were followed by another on "Financial Intermediation and Economic Developments: An empirical investigation" and which should be considered as a sister paper to the early one on "Interest Rate, Transactions Costs and Financial Innovations". The output, thus, has not been a negligible one.
- 21.- In the development of the project three types of preoccupations are clearly discernible. The first one is with the need that was felt to make an examination of the impact that transaction costs have in lending as well as in borrowing in different markets. This is a subject in which there are obvious gaps in the literature and in particular in relation with the financial systems of LDC's. The second reponds to the preoccupation of the possible effects that banking regulations in LDC's may have on the banking structure and in the long run financial viability of the banks. The third one concerns the need to have a model that would express the possible interaction between the development of capital markets and general economic development. These will be briefly examined in reverse order.
- 22.- The third subject of research is covered by two papers of which one presents a general model and the other attempts an empirical verification of some of the issues raised in the first one. But the latter, in fact, is more than an extension of the former.

Their aim is to better understand the role that financial intermediation plays in the development process as well as an identification of the factors which limit its effectiveness and the benefits which may accrue from improving it. This was justified on the other hand by the fact - which seems a valid one - that economic analysis in the past has generated "neither a body of reasonably rigorous theory nor a wealth of credible economic results".

- 23.- The central argument of the model, which does not as yet seem adequately proven, is that for a given production function and state of non financial technology there is a role to be played by financial intermediaries channeling resources from low to high return sectors thereby raising the aggregate marginal productivity of capital. The limits on this role have been defined at one end by the overall rate of return which would prevail in the absence of financial institutions and, at the other, by rate which would prevail when capital markets are perfect.
- 24.- Together with the presentation of the model the papers include a relatively thorough review of the existing literature and, as mentioned above, an empirical verification of a limited version of the model. However, it is obvious that further work will have to be done in the future. One obvious need concerns the nature of the data and also further examination of the results provided by the model. One possible approach could be to take countries not based solely on geographical considerations but taking also into account their level of development and the structure of their economies.
- 25.- Another paper examines the relationship between earnings and portfolio of the commercial banks of three Asian countries: Philippines, Thailand and Singapore. The technique used was that of statistical cost accounting and followed with some variations the methodology previously used by Hester and Zoellner. As in other cases the research was also justified on the grounds that analysis of this type are scant in developing countries.
- 26.- The investigation is well conducted and the conclusions are interesting in that both, the rate of return on loans and administrative costs seem to be positively correlated with the degree of regulation in banking operations. The lowest figures correspond to Singapore which of the countries examined is the one that presents the more competitive financial market and is the less regulated. This is an analysis that undoubtedly, can be further refined and extended to a larger number of countries although we should mention data problems in several cases will prove to be quite significant.

- 27.- The paper on the relations between interest rate and transaction costs is an interesting one and developed with technical competence. It raises a valid point in calling attention to the importance of transaction costs for the borrower and the lender and thus, in a certain sense, to the need to innovate in the process of financial intermediation. However, it is not clear yet, the significance of this factor alone. The study previously referred to on banking in the Philippines, Thailand and Singapore estimated the administrative costs of lending at 0.1-0.5, 1.4-2.0 and 0.77 percent respectively. It seems, therefore, that there are other more important factors to take into consideration.

#### Public Enterprises

- 28.- RPO project 671-11 (Managerial Structures and Practices: Public Manufacturing Enterprises), is up to now the only research project by the Bank on this area. It started on March 78 and it is expected that the final report will be submitted in January 1980. In addition it is also being considered in a certain sense as an extension of some previous work and in particular reconnaissance missions that were previously made to Egypt, India and Yugoslavia. As yet, the only report available is a case study of a public enterprise: India's Swaraj Tractor.
- 29.- The research proposes to examine a set of hypothesis which it is said, "are best described by the general proposition that the performance of public manufacturing enterprises is dependent upon their organizational and managerial structures and practices as well as the policy environment within which they operate". It is justified on the basis of the fact that a large part of the lending operations of the Bank concern public enterprises and that they are a growing sector in LDC's industries. And, in addition, a type of enterprises about which not much is known and where in general, little research has been done.
- 30.- As mentioned before the only report available up to now is on the Swaraj tractor plant in India. The report is interesting and particularly the point which shows the significance that indigenous technical developments and adaptations had in the shaping and the improvements in the competitive position of this plant. But one could also say that it does not allow one either to evaluate the overall approach taken by the Bank on this question or to arrive to more definite conclusions.

- 31.- In view of this it might appear convenient for the management of the Bank to give more reflexion to the research work done in this area. The area itself is of prime importance for the Bank from both points of view; allocation of resources, since a large part of its loans go to public enterprises and its advisory role to LDC's. It appears obvious that in the absence of a coherent body of thought on these questions there is a great risk for dispersion of the research efforts. This would be unfortunate since it appears to us that the Bank, on account of its experience and the insights that could be provided by research executes in other areas, it is difficult to think, worldwide, of any other institution that could do it.

#### General Evaluation

- 32.- It is quite clear that the subjects pertaining to small enterprises, credit markets and public enterprise, have a large relevance for Banks operations, and for LDC's. However, it is also clear that here we have a case where relevance is not matched by the research effort actually carried out.
- 33.- There are several factors which could account for this situation. One of them, perhaps, is the fact that in the past the Bank thought that the best way to approach these problems was in an ad-hoc basis through the operational units and, thus, that there was no need to support their actions with a research basis. This is what would account for the additional fact that all these areas of research are relatively "new" within the Bank. Indeed, one could go further and even argue that there was some sort of resistance to include these and other types of institutional research within the body of research carried out in the Bank.
- 34.- Even now, one can discern the prevalence of two types of attitudes. On the one hand, there are those that consider research in institutional questions as "interesting" but devoid of academic rigorousness and on the other, those of some researchers on institutional matters that tend to consider other research by the Bank as frequently too academic and of little relevance either to the Bank or, worst, to the real world. By no means this is an unique situation in research institutions, but there is no doubt that, as has been proven by the Bank itself, there is a lot to be gained through a better coordination of efforts.
- 35.- All of this, obviously, is not something that can be attained overnight. But it is probable that a large part of the problem could be solved if the Bank could attract high caliber researchers for this area and with a solid reputation, just as it did in other areas. It seems to us, in short, that as yet, one does not have

in these fields of Bank research the kind of intellectual leadership that prevails in the other more traditional areas of research. Their presence, aside of prestige reasons would be very useful because it would allow the Bank, on the one hand, to have a better analytical frame work to give a greater coherence and sense of direction to the research and, on the other, to establish a better working relationship with research in other parts of the Bank and elsewhere. In the absence of this we think that there may indeed be a great risk of either a dispersal of efforts or of conducting research which could be of small relevance for the Bank and for policy formulation. Eventually, this could lead to the gradual abandonment of this type of research. This would be a pity because, as has been emphasized we think that research in these areas is of significance for Bank operations and for LDC's policy formulation.

- 36.- One other aspect that we would also like to touch upon is the question of how normative should be this type of research. In our opinion it should be high. Through its research the Bank should be able to discern which types of policies and programmes for development in a Schumpeterian sense are successful and under what conditions, and likewise which are unsuccessful and why. This, it must be said, is one frequently mentioned objective in the research proposals but which doesn't come across quite clearly in many of the papers under revision. It may be due to the fact that many of the RPO-Projects are still on a preliminary stage and therefore it is not easy, at this moment to extract this type of conclusions. But, be that as it may, it is nevertheless clear that this is an area where the Bank would be utilising, at its fullest, one of its comparative advantages in research vis a vis other institutions.
- 37.- To finalize this section, we will touch briefly upon some of the more relevant questions put forward to the members of the panel. Firstly, we would like to stress that a large part of the papers under revision show high technical competence. If one does not find in this area the same number of publications in specialized journals that one finds in other areas of research in the Bank, it would be wrong to jump to the conclusion that the prevailing quality standards are much lower in one part than in the other. In fact, there might be a host of factors to explain this situation; one of them, of no small significance being the short period in which research in this area has been done. It is clear that many of the papers, duly revised, could be amenable for publication in many of these journals. Secondly, as to the usefulness for the Bank of the results from research it appears to us that, indeed, it should be high once the projects are more advanced. One could go even a step further

to say that research of this type is sorrowfully needed by the Bank if it wants to allocate its credit resources more in accordance with a "basic needs" philosophy of development. And this is, as the experience of some countries starts to show, by no means an easy task. It must be mentioned also, however, that contrary to what has happened with other research, this might not be, and perhaps should not be, politically innocuous. Thirdly there are the questions on basic research and on the degree to which research by the Bank duplicated those of other institutions. With regard to the first part, the answer is that there has been some basic research and especially in the areas of small enterprises and in the role of financial development on the development process. But our recommendation here would be in favor of more, rather than less, basic research. There are a number of aspects about which the existing knowledge is imprecise and especially when dynamic factors are taken into consideration. As to the second part of the question it simply doesn't seem that the Bank has duplicated work by other institutions. In practically all RPO's a point has been made to undertake overall reviews of the literature on the different subjects. This has assured to a certain extent that research duplication was avoided. In fact, and to be more precise, far from duplicating, in many cases the research done by the Bank on these topics has been original and pathbreaking. This is the case, for example, in research about SSE's and there are obvious possibilities of doing likewise in connection with public enterprises.

- 38.- As to the impact of research on LDC's the questions are somewhat more difficult to answer. We would like to start by pointing out that in all RPO's under revision there is participation of researchers from LDC's, though in some is greater than in others. As to the influence that this may have upon LDC's policy formulation and relations with the Bank it is difficult at this time to define their precise character in the future. But the Bank has already quite a substantial experience in this regard and, at least, we think that it will not be substantially different from other experiences; i.e., that if there is substantial interest in the problem under consideration many of the recommendations filter themselves to the policy decision making bodies. Here, our preoccupation doesn't concern so much the latter question but rather the fact, already expressed, that perhaps the Bank could have widened, from the beginning, the scope of some of the studies in order to cover a larger number of countries. This would certainly have created some problems particularly for coordination and data handling but it appears, at least superficially, that the advantages would have been greater. There is in many countries a real need to know more and to receive better advice in most of the subjects covered by this chapter. And this

is valid even for the Bank itself. We were impressed in our conversations with Bank staff and in reading Bank memoranda of the difficulties that have many Bank's missions in answering questions that are frequently posed to them by government's officials such as what should be a sensible policy vis a vis public enterprises or SSE's development programmes and so forth and for which up to now only very vague or general answers could be provided.

- 39.- We come now to the question of allocation of resources. Here we can make only two considerations. First, within the area itself, our impression is that it would have been preferable to concentrate most of the resources on SSE's and Public Enterprise, rather than on SSE's and credit markets as has been the <sup>case</sup> use. To us the former two appear to be more significant from the point of view of the development process, policy formulation and Bank's operations. But it could be argued that not sufficient factors have been taken into consideration and that the choice reveals personal preferences. Indeed, this may be so. But, secondly, and perhaps more important, there is the problem of the financial resources that have been allocated for research in these areas. There is a need to increase them and, in particular, to obtain the concours and collaboration of highly qualified people.

#### Recommendations regarding further research

- 40.- The work done by the Bank on Capital Utilization, capital labor substitution, SSE's and in technical change itself have put in evidence the need to undertake more thorough studies of the role that this latter factor, technical change, plays in economic development. This, by the way, coincides very much with a growing preoccupation in many LDC's about the relation between technological development and overall economic development. This preoccupations, in fact, have to do with a number of factors. In the past, for example, it had much to do with the question of negotiating international transfers of technology, but nowadays it is clear that this is only one of the aspects involved and that perhaps more important are the aspects concerning the selection, adaptation and absorption of technology. Likewise, the importance of developing a domestic scientific and technological capability in order to better cope with the problems posed by the development process and in particular for the utilization of renewable and non-renewable resources is coming more and more in the forum of discussions. Certainly it is not an easy task but it seems to us, that questions of this sort should be covered by research in the Bank.

41.- It appears that the area of public enterprises has not been sufficiently studied in the Bank or, for that matter, anywhere else. The recommendation was made above for the Bank to essay what would amount to a fresh approach for research in this area. There are many questions here for which answers are, at the most, only fragmentary. Amongst them, we should like to point out the relations between public enterprises and the public sector, or with the private sector of the economy or their role in technological developments, etc. It is, to a certain extent, a virgin area though its importance for economic policy formulation or for Bank's operations is well recognized.

3.5

Evaluation of Bank Research on  
Programming in the Manufacturing Sector

Chapter III.5

1. The Nature of the Research

A number of research reports and monographs are expected from the research program carried out under the heading "Programming in the Manufacturing Sector" (RPO. No. 670-24). The list of reports/draft reports which were studied for this review are given in annex. 1. The program has dealt with the problems of investment planning in industries characterised by increasing returns to scale and in industries where interdependence in the production of different products is important. Interdependence may be important when different products share capital equipment or when they use the same intermediate inputs, the manufacture of which may exhibit economies of scale. It has focused on development of improved methods for selecting investment projects from among the many alternatives in size, timing, location, technology and output mix. In addition, it has investigated the 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". Those industries characterised

by a manufacturing 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".

Both these sets of studies have used mixed integer programming models in a fixed charge formulation to account for economies of scale. The major problem in these studies apart from the considerable efforts and time that usually go into data collection and organization, has been the problem of obtaining solutions of the mixed integer programming models with a large number of integer variables. Solutions of such problems require large amount of computer time. A number of procedures have been developed to eliminate through simple but sophisticated analysis a number of integer variables which represented uneconomical choices, to reduce the size of the programming model. This makes obtaining solutions to such problems, practicable.

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

(c) 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.

(d) The cost of complete neglect of interdependence in choosing between production and imports is not significant at the sector level. For the part of the mechanical engineering sector of Korea that was studied (120 carefully selected products), this would have led to an increase sector-wise total supply cost of no more than 3 percent of the total value added for the products involved in the study.

(e) Though the loss at the sector level is small for particular products, the conventional benefit cost analysis which neglects interdependence, may lead to wrong make/buy choices when the products are a part of a sector that exhibits interdependence.

(f) The absolute cost of neglect of interdependence is "by no means trivial" and is "far more" than the cost of conducting studies that account for interdependence.

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. In particular, the following have been shown:

(a) Even without obtaining globally optimum solution, use of programming models can provide a lot of insight into the nature and the costs of the various alternatives.

(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 a significant number of integer variables.

## 2. Review of Studies

2.1 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 formulation of the models for the fertilizer sector are conventional and straightforward. However, because of the shortcuts developed to reduce the size of the problem through pre-analysis, the models have been considerably more detailed, and consequently, operationally more meaningful.

An obvious limitation of the models as developed is the neglect of uncertainties. Explicit accounting for it might make the computation problem even more formidable. Yet it would be useful to explore to what extent 'pre-analysis' and sensitivity analysis can account for uncertainty.

A number of other studies have also been carried out for different sectors and countries and regions. These include among others fertilizer for Asean, Andean pact and India; Forest sector

for Turkey, Paper and pulp for countries of the Asean Region and FAO's World program; Clinker production for Brazil, Petrochemicals for Portugal and Mexico, Energy for Nigeria, and Chemicals for Turkey.

An attempt to use this approach to develop a model to quantify the benefits of regional integration based on a simultaneous analysis of a number of industrial sectors, the pros and cons of which were succinctly presented in a small paper, was abandoned as being too ambitious.

The project has obviously been successfully carried out and as judged from the number and variety of applications it has been found useful too. The project has reached a stage where research ends and applications begin. But the technology developed has to be successfully disseminated and transferred. A most important element in facilitating such transfer would be the development of computer software which make it convenient to specify the problem preferably in the language of the users as opposed to the language of the computer specialists. In addition it would also be essential to generalize and automatize the breakeven analysis, for otherwise, applications would need, not only trained but clever people and would be severely limited in scope. Thus the software development project (GAMS, RPO 671-58) has to be welcome.

2.2 Non-process Industries - Study of The Korean Mechanical Engineering Sector: The study of the Korean Mechanical Engineering sector has explored the gains from planning simultaneously the supply of a large number of products. 120 carefully selected items were endogeneous. The gains in the economies 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. 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. These pose not insignificant problems.

In applying a micro-analytic approach to a sectorwide study, there is a danger of getting lost in details and not seeing the woods for the trees. This is avoided in the study, by describing certain standardized products whose production processes are described at the shop level rather than at the machine level. Even then, the breadth and depth of the technical engineering detail that is incorporated in the study is to be found in hardly any other programming study.

The model used here is a mixed integer programming one and break-even analysis is developed and used to reduce computational difficulties.

In addition, the allocative consequences of the results are explored in depth. An evaluation of alternative investment criteria is also made in the context of the results obtained from the model. The conclusion is reached that simple benefit cost criteria or the measures of comparative advantage, though they do not discriminate unambiguously between make-buy choices, are adequate and entail a small loss compare to analysis which account for interdependence.

It is also claimed that the loss entailed in using the best of the benefit-cost criteria is still large enough to pay back for the cost of more comprehensive analysis within one to two years. The validity of the claim, however, depends upon the assumption that the indicated solutions from these two methods can be implemented with equal efficiency.

The project also complements a number of other research studies where attention to micro-level details may be crucial. The research programs on the scope for capital-labour substitution in the mechanical engineering sector "(RPO 670-23) and on "Approach to Industrial Technology" (RPO 671-51) are such projects.

### 3. Evaluation

3.1 Quality of Research: The research work is certainly of a high calibre. Moreover, such research is hardly carried out outside the bank. The research output is high both in its volume and in the quantity.

3.2 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 developments. The planning models developed by Bank's research has the potential to improve the rationality of government decisions in developing these sectors. Some of this potential is already realized in the numerous applications already made for different sectors and different countries.

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

### 3.3. Usefulness 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. 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.

3.4 Development of Research Capacity in LDCs: 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.<sup>1/</sup>

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 LDC's 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.

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<sup>1/</sup> Even Korea where substantial local involvement in Bank research has taken place over a number of years, has recently requested assistance in the formulation of investment programmes in fertilizer, pulp and paper and basic metals. To what extent this is just a way of obtaining help of competent researchers from the Bank at lowest cost and to what extent this reflects on the difficulties of skill transfers is anybody's guess.

4. Suggestions for Research in Future

(a) 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 would be required.

Writing manuals accessible to technical persons, even when the manuals are written to be accessible to non-specialists, is only a beginning. Short training courses would also be inadequate. What would be required is a case study for a sector, which is 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.

Development of user oriented software which permits convenient specification of the problem by users, who may not be computer specialists, could be of invaluable help in promoting such studies.

(b) Programing models to Evaluate Appropriate Technology for Rural Industrial Development: The studies in industrial programming under RPO 670-24 have 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 efforts, one could have used these models <sup>to</sup> 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 pursue, one might lay an emphasis on income generation in selecting "appropriate" techniques.

(c) Institutional issues in Implementation and Capacity Utilization:

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

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? Are delays and inefficiencies inherent in the organisation of the public sector, which plays a large part in the development of industrial sectors in some countries? Does the private sector really perform better? These issues 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 a wide range of characteristics.

(d) Consequences of Interdependence for Planning and Promoting Industrial Development: If economies of scale and interdependence are important then the development of that industry would benefit from some form of central planning or coordination. On the other hand, effective implementation and central planning of a sector such as the mechanical engineering industry characterised by a large number of products and processes is difficult to say the least.

Thus the findings of the Korean Mechanical Engineering Industry study that interdependence is not of much quantitative consequence is very comforting as one can rely on implementable, decentralized procedures for developing the industry. Yet the finding needs to be confirmed with further research. Would a different set of international prices such as may prevail at other times lead to a different result? Would different domestic prices, such as may be found in another country, give a different result? Would a different product-mix produce contrary results? Is it possible that under such different circumstances the benefits of accounting for interdependence would be

highly significant say 50% or more of the value added in the sector?

The quantitative dimension of effects of interdependence is sufficiently important for policy purposes that further explorations to test the generalizability of the Korean Mechanical Engineering study are called for.



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INSTITUTION FOR SOCIAL AND POLICY STUDIES  
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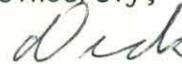
March 6, 1979

Mr. Suman Bary  
The World Bank  
1818 H Stree, N.W.  
Washington, D.C. 20433

Dear Suman:

Enclosed is a copy of the final version of my report on World Bank Projects on Capital Utilization, Capital Labor Substitution, and Technological Change. I didn't find anything in the letters from the Bank that caused me to change very much.

Sincerely,



Richard R. Nelson

RRN/mds

Enclosure

Chapter III.6

WORLD BANK PROJECTS ON CAPITAL UTILIZATION, CAPITAL LABOR SUBSTITUTION,  
AND TECHNOLOGICAL CHANGE

I. DESCRIPTION OF THE TOPIC

The body of bank research reviewed here is concerned with the connected topics of the range of choice of technique, factors influencing the technique chosen, efficiency in the use of a technique, adaptation of techniques, and technical progress in industry.

The policy thrust of the research has been provided by the belief that labor is cheap and capital expensive in less developed countries relative to developed ones, that this ought to be reflected in use of more labor intensive techniques, but that while this was happening to some degree it still was possible and desirable that the techniques employed be more frugal on use of capital. Throughout, the research has been concerned with market and other forces that explain the prevailing situation, and with policies that could improve the environment so that choice of technique would be made more appropriately, techniques used more efficiently, and adaptation and learning proceed more effectively. The analysis has been concerned both with contexts in which decision-making with respect to technique is made largely by private profit-oriented entrepreneurs, and with situations in which the government is the decision-maker or has a great deal of direct control over private decisions. The specific topics studied have evolved over the years as work done under one project generated insights 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 in the Bank about industrialization problems, but which is influencing thinking within the development economics community more broadly.

## II. PROJECT REVIEW

The specific projects reviewed here are 670-23, 670-25, 670-54, 670-95, and 671-51. Three of these projects now are closed out, and have received earlier reviews. The Bank research on industrial capacity utilization (670-25 and 670-95), now completed, was concerned with assessing carefully and empirically casual observations that despite the scarcity of capital in less developed countries, capital was not being used very intensively. If the proposition held up under such scrutiny, the project aimed to contribute to understanding of the phenomena and of ways to improve the situation. The basic ideas originated outside of the Bank, and scholars had been working on the problem before the Bank got seriously into the study of capacity utilization. But the Bank work was of considerable scope, and contributed to the growing appreciation that indeed in many cases capital was not being worked very intensively in LDC industry. Bank research identified a number of factors, associated with imperfect input markets and various legal and institutional restrictions, that seemed to lie behind the non-economical use of plant and equipment. Project 670-95, which was completed largely by or under the close supervision of bank employees, was more successful than 670-25, which was farmed out to a consultant.

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.

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 methodological, 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 other work 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 have been put together on the first issue, and some literature review, casual empiricism, and thought have been directed at the second. The work, particularly on the domestic capital goods industries, shows promise, but it is too early to tell how successful the endeavor will be.

Projects 671-51 and 670-23 complement 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 a complementary interest in institutional structure. These intellectual developments will be discussed later.

### III. GENERAL EVALUATION

The work reviewed above while of variable quality generally merits a high rating. The research has contributed and is contributing to knowledge. By and large the Bank has exploited its comparative advantage, has avoided duplicating work that was being done elsewhere, and has proceeded in good awareness of that work. The research certainly has influenced the thinking within at least some parts of the Bank regarding the importance of the capital labor substitution problem and the scope of possible substitution. At the present time efforts are being made to implement this appreciation in project decision-making. The work seems to have influenced thinking regarding both the importance of having the right prices, and the importance of having institutions that channel funds and information effectively. Particularly the empirical work has involved researchers in less developed countries. By and large the work has been led by people full-time at the Bank. Where outsiders or part time consultants led, the results were much less satisfactory.

#### IV. RECOMMENDATIONS REGARDING FURTHER RESEARCH

We think that Bank research exploring and documenting the range of possible capital-labor substitutions in particular technologies is now running into diminishing returns. The general point that there is a wide range of choice is now well substantiated. The techniques involved in identifying the relevant substitution possibilities in particular technologies may now be ready for practical application. We note that practical application almost certainly will involve less detailed breaking down of processes than was relevant when the endeavor was viewed as a research study. We think this research endeavor should be phased down and effort placed in helping the operative divisions and departments to be able to themselves do the relevant analyses.

The project on appropriate technology presently is being conducted at a modest level, and in an exploratory manner. We think that particularly the part of the project exploring the design capabilities of domestic capital goods producers has considerable promise.

Research within the Bank, and elsewhere, is revealing that there does indeed exist this design capability within the capital goods industry of at least some countries. This project is a serious candidate for more resources.

The Bank's research under the current two projects increasingly is highlighting that effective capital-labor substitution, the adoption of appropriate technology more generally, and over the long run the development of an efficient industrial sector, is not adequately described merely in terms of "picking things off the shelf". The research has documented the wide range of catalog items available. But it also has documented that it is no trivial matter for a firm to be aware of more than a small portion of the range of choice. Increasingly

the research is showing that 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.

We 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. And in fact the batting average in projects where there was little analytic structure has not been high. Issues of innovation, and institutional structure tend to be viewed as "unresearchable" or at least not amenable to rigorous research. But we propose that the logic of the Bank's own past research endeavors has led it inexorably to a requirement to engage in this kind of research. It already is engaging in such work, but with apparent methodological nervousness. However, 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. We think the Bank should accept the obvious challenge.

It may be useful to give several examples of the kind of work on industrial organization and technical change that might serve as models for research at the bank. Over the past half dozen years a considerable

amount of research has been done, principally by American economists, aimed at exploring the costs of government regulation. A good reasonable overview of much of that work is provided in A. Phillips (ed) Promoting Competition in Regulated Markets. While we are nervous that much of the research by American economists on regulation has stressed the costs and downplayed the benefits, the identification and attempted quantification of the costs has been illuminating, and such work has had a significant effect on policy.

The work of Edwin Mansfield provides good examples of quantitative studies on R & D, technical advance, and productivity growth. A good collection of Mansfield's earlier work is contained in his Industrial Research and Technological Innovation. A recent study of his (and his students) in which he attempted to measure both private and social rates of return on industrial innovation was published as "Social and Private Rates of Return on Industrial Innovation", QJE, 1977. There also has been a very good work on the economics of technical change in industry undertaken by Christopher Freeman at the University of Sussex, often in collaboration with other members of Science Policy Research Unit there. A portion of that work is presented, in capsule form, in Freeman's book, The Economics of Industrial Innovation.

There has been some work on technical change in less developed countries, but not much. There are several interesting studies focused on agriculture. Hayami and Ruttan's book, Agricultural Innovation, is a useful reference. At the present time Jorge Katz is directing a study on innovation in Latin American industry under the joint auspices of the IDB and ECLA. These studies represent a start. We think the time is ripe for the Bank to get into the field in a big way.

Chapter III.6

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AND TECHNOLOGICAL CHANGE

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The policy thrust of the research has been provided by the belief that labor is cheap and capital expensive in less developed countries relative to developed ones, that this ought to be reflected in use of more labor intensive techniques, but that while this was happening to some degree it still was possible and desirable that the techniques employed be more frugal on use of capital. Throughout, the research has been concerned with market and other forces that explain the prevailing situation, and with policies that could improve the environment so that choice of technique would be made more appropriately, techniques used more efficiently, and adaptation and learning proceed more effectively. The analysis has been concerned both with contexts in which decision-making with respect to technique is made largely by private profit-oriented entrepreneurs, and with situations in which the government is the decision-maker or has a great deal of direct control over private decisions. The specific topics studied have evolved over the years as work done under one project generated insights 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 in the Bank about industrialization problems, but which is influencing thinking within the development economics community more broadly.

## II. PROJECT REVIEW

The specific projects reviewed here are 670-23, 670-25, 670-54, 670-95, and 671-51. Three of these projects now are closed out, and have received earlier reviews. The Bank research on industrial capacity utilization (670-25 and 670-95), now completed, was concerned with assessing carefully and empirically casual observations that despite the scarcity of capital in less developed countries, capital was not being used very intensively. If the proposition held up under such scrutiny, the project aimed to contribute to understanding of the phenomena and of ways to improve the situation. The basic ideas originated outside of the Bank, and scholars had been working on the problem before the Bank got seriously into the study of capacity utilization. But the Bank work was of considerable scope, and contributed significantly to the growing appreciation that indeed in many cases capital was not being worked very intensively in LDC industry. Bank research identified a number of factors, associated with imperfect input markets and various legal and institutional restrictions, that seemed to lie behind the non-economical use of plant and equipment. Project 670-95, which was completed largely by or under the close supervision of bank employees, was more successful than 670-25, which was farmed out to a consultant.

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.

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 methodological, 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 other work 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 have been put together on the first issue, and some literature review, casual empiricism, and thought have been directed at the second. The work, particularly on the domestic capital goods industries, shows promise, but it is too early to tell how successful the endeavor will be.

Projects 671-51 and 670-23 complement 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 a complementary interest in institutional structure. These intellectual developments will be discussed later.

### III. GENERAL EVALUATION

The work reviewed above generally merits a high rating. The research has contributed and is contributing to knowledge. By and large the Bank has exploited its comparative advantage, has avoided duplicating work that was being done elsewhere, and has proceeded in good awareness of that work. The research certainly has influenced the thinking within at least some parts of the Bank regarding the importance of the capital labor substitution problem and the scope of possible substitution. At the present time efforts are being made to implement this appreciation in project decision-making. The work seems to have influenced thinking regarding both the importance of having the right prices, and the importance of having institutions that channel funds and information effectively. Particularly the empirical work has involved researchers in less developed countries. By and large the work has been led by people full-time at the Bank. Where outsiders or part time consultants led, the results were much less satisfactory.

#### IV. RECOMMENDATIONS REGARDING FURTHER RESEARCH

We think that Bank research exploring and documenting the range of possible capital-labor substitutions in particular technologies is now running into diminishing returns. The general point that there is a wide range of choice is now well substantiated. The techniques involved in identifying the relevant substitution possibilities in particular technologies may now be ready for practical application. We note that practical application almost certainly will involve less detailed breaking down of processes than was relevant when the endeavor was viewed as a research study. We think this research endeavor should be phased down and effort placed in helping the operative divisions and departments to be able to themselves do the relevant analyses.

The project on appropriate technology presently is being conducted at a modest level, and in an exploratory manner. We think that particularly the part of the project exploring the design capabilities of domestic capital goods producers has considerable promise. If that endeavor begins to yield interesting findings, suggesting that a considerable design capability exists or can be encouraged, then the project would be a serious candidate for more resources.

The Bank's research under the current two projects increasingly is highlighting that effective capital-labor substitution, the adoption of appropriate technology more generally, and over the long run the development of an efficient industrial sector, is not adequately described merely in terms of "picking things off the shelf". The research has documented the wide range of catalog items available. But it also has documented that it is no trivial matter for a firm to be aware of more than a small portion of the range of choice. Increasingly

the research is showing that 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.

We 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. And in fact the batting average in projects where there was little analytic structure has not been high. Issues of innovation, entrepreneurship, and institutional structure tend to be viewed as "unresearchable" or at least not amenable to rigorous research. But we propose that the logic of the Bank's 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. We think the Bank should accept the obvious challenge.

It may be useful to give several examples of the kind of work on industrial organization and technical change that might serve as models for research at the bank. Over the past half dozen years a considerable

amount of research has been done, principally by American economists, aimed at exploring the costs of government regulation. A good reasonable overview of much of that work is provided in A. Phillips (ed) Promoting Competition in Regulated Markets . While we are nervous that much of the research by American economists on regulation has stressed the costs and downplayed the benefits, the identification and attempted quantification of the costs has been illuminating, and such work has had a significant effect on policy.

The work of Edwin Mansfield provides good examples of quantitative studies on R & D, technical advance, and productivity growth. A good collection of Mansfield's earlier work is contained in his Industrial Research and Technological Innovation . A recent study of his (and his students) in which he attempted to measure both private and social rates of return on industrial innovation was published as "Social and Private Rates of Return on Industrial Innovation", QJE, 1977. There also has been a very good work on the economics of technical change in industry undertaken by Christopher Freeman at the University of Sussex, often in collaboration with other members of Science Policy Research Unit there. A portion of that work is presented, in capsule form, in Freeman's book, The Economics of Industrial Innovation:

There has been some work on technical change in less developed countries, but not much. There are several interesting studies focused on agriculture. Hayami and Ruttan's book, Agricultural Innovation, is a useful reference. At the present time Jorge Katz is directing a study on innovation in Latin American industry under the joint auspices of the IDB and ECLA. These studies represent a start. We think the time is ripe for the Bank to get into the field in a big way.