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The World Bank and port development

A. J. CARMICHAEL

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Great George Street, London, S.W.1

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7183 The World Bank and port development

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A brief description is given of the membership, financial structure and organization of the World Bank Group (the International Bank for Reconstruction and Development, the International Development Association and the International Finance Corporation). The internal workings of the Bank are then described and, in particular, the operations of the Projects Department in the field of transportation. The work of the Port Section of the Transportation Division is described; also given are some of the considerations and criteria borne in mind by Bank staff working on port feasibility studies and project appraisals. An example is given of the processing of a typical port project from the time of request for a loan to final loan signing. The Paper concludes with some observations as to how consultants should set about obtaining new business and of their important and expanding role in Bank-financed projects in the less developed countries of the world.

Introduction

The World Bank is one of the beneficiaries of what is popularly known as the 'brain drain': that is, it employs a large staff of engineers and specialists in other professions outside their home countries. One purpose of this Paper is to show that this drain should not be sealed off, because it benefits not only the developed nations, which are the main suppliers of the Bank's technical personnel, but also the less developed nations which need the technical and financial assistance provided by the Bank.

2. The World Bank Group consists of the International Bank for Reconstruction and Development (World Bank), the International Development Association (IDA), and the International Finance Corporation (IFC). This group is one of the specialized agencies of the United Nations. It is an important and independent member of the growing community of governmental and private organizations engaged in international aid and lending.

3. The World Bank, the senior institution of the group, opened for business in 1946, having been established at the Bretton Woods Conference of 44 nations in 1944. After making initial loans to assist in the post-war, pre-Marshall-Plan reconstruction of Europe, the Bank has tended to concentrate on lending for high-priority projects in the developing world. Loans are usually direct to governments or organizations such as port authorities or railways, with a government guarantee. A typical port loan may have a life of 25 years, including a grace period of five years, and interest at 6½% (interest rates were increased to 6½% on 1 August, 1968): this is termed a 'hard' loan.

4. The IFC came into being in 1956. It furthers economic development by providing equity and loan capital for private enterprises, in association with private investors, without government guarantee. Since, from the nature

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of their organizations, most port authorities are unlikely to require the services of the IFC no further description is given in this Paper.

5. The IDA was formed in 1960 to meet the needs of those countries for which external capital is essential to their development but which cannot be serviced on conventional terms. The IDA finances the same type of project, after the same evaluation process, as the Bank. The financing terms, however, place a much lighter burden on the country's balance of payments. A typical IDA credit extends over 50 years, without interest, and with amortization as follows: first, a grace period of 10 years, then 1% per year for the next 10 years, then 3% per year for 30 years. The borrower pays a service charge of 3-4% per year on the principal amount of the credit withdrawn. Such terms are rightly called 'soft'. The IDA's staff are Bank personnel wearing different hats.

6. To co-ordinate the activities of the various governmental and private organizations of the capital-exporting countries involved in international lending, the Bank has organized consultative groups or consortia. These serve as forums for the exchange of information and discussions on the particular economies, their development plans, and capital requirements. Such groups have been formed for Ceylon, Colombia, East Africa, India, Korea, Malaysia, Morocco, Nigeria, Pakistan, Peru, Sudan, Thailand and Tunisia, and others are under discussion.

Bank and IDA: membership, financial structure and organization

7. By June 1968 membership of the Bank had grown to 109 out of a total UN membership of 125 countries: that of the IDA to 100 countries. The Bank is truly a World Bank—its member-share-holder governments are spread throughout the non-communist world, and it finances projects and mobilizes funds on all continents.

8. The Bank is in effect a corporation in which its members hold shares and voting rights in proportion to the size of their contributions; for example, among the industrialized nations: USA (24.8%), UK (10.25%), Germany (5.09%), France (4.20%), and among the non-industrialized small nations: Burundi (0.16%), Cyprus (0.16%), Guatemala (0.14%), and Lebanon (0.13%). Voting power of IDA members is approximately similar to that in the Bank. The organizational structure for policy formulations and executive supervision is essentially the same in both institutions.

9. Both the Bank and IDA have their own assets: each is financially distinct. The Bank has three primary sources of funds: the paid-in capital of member governments, borrowings, and net income. The IDA's resources come principally from budgetary allocations of the 16 richest member governments*; in addition, the Bank has made transfers from its profits to the IDA.

10. The capitalization of the Bank was changed in 1959 so that, in practice, 1% of each member's total subscription is payable in gold or US dollars and 9% payable in the subscribing country's currency and is to be lent only with its consent. By 30 June, 1968, subscribed capital had risen to over \$22 900 million†—reinforcing the security offered to investors and enhancing the Bank's

* Switzerland, which is not a member of the Bank or the UN, has, however, made a loan of Swiss Francs 50 million to IDA.

† Sums quoted are in US dollars.

borrowing power. Financial and operating data through the financial year 1968 and the preliminary forecast for 1969 are given in Appendix I.

11. Ultimate power in the Bank is vested in a Board of Governors, consisting usually of the Minister of Finance or Governor of the Central Bank of each member country. In practice, most of the authority of the Board of Governors is delegated to Executive Directors. The President of the Bank serves as Chairman of the Executive Directors. All proposals for loans, credits, major technical assistance operations and other matters involving policy issues are submitted to the Executive Directors for their consideration and decision. Such proposals are first reviewed by a Loan Committee, consisting of senior Bank staff, which makes recommendations to the President who, in turn, submits them to the Board.

12. The Bank currently has a staff numbering 1800 (about 50% being professionals) from 75 countries, who are employed in the following departments: Administration, Area, Development Services, Economics, Information, Legal, Programme Evaluation and Control, Projects, Secretary's and Treasurer's.

13. The principal mechanism for internal operational co-ordination is known as the Country Working Party which is headed by the Area Department loan officer and has representatives from the Projects, Legal and Treasurer's Departments.

14. There are five Area Departments in the Bank: Africa, Asia, Europe, the Middle East and North Africa, and the Western Hemisphere. Their function includes the planning, negotiation, administration and co-ordination of lending operations in their respective areas. Each Area Department maintains current information on the countries in its area and is responsible for economic studies and missions, appraisal of development programmes, assessment of development policies, economic performance and credit-worthiness of borrowers, and the identification of projects for possible Bank financing.

15. The Legal and Treasurer's Departments are concerned with the usual tasks of these professions.

16. Last, but by no means least, is the Projects Department whose activities are more fully described in §§ 18 and 19. The primary task of this department is to identify, help prepare and appraise projects, and supervise their construction and operation. It also supervises sector and feasibility studies financed by the Bank as part of its Technical Assistance Programme or when acting as Executing Agency for the United Nations Development Programme (UNDP). It approves consultants selected by borrowers and helps to prepare their terms of reference. In conjunction with the Administration Department, it selects consultants who are directly engaged by the Bank. It makes recommendations on the amounts and terms of loans and on contractual arrangements; and it ensures that the procurement of goods and services under the projects which the Bank finances is in accordance with its guidelines established for this purpose. In short, the Projects Department sees that a project is technically sound and financially and economically satisfactory. It is, in effect, the technical arm of the management of the Bank.

Loans and credits made

17. To give some measure of the Bank's operations and the work processed in the Projects Department, the cumulative total of the Bank loans and IDA

credits made to 30 June, 1968, is given in Appendix 2. Transportation tops the list, with the largest total. Of 545 Bank loans and 124 IDA credits totalling \$12 935 million made for projects, some 218 were transportation projects, totalling \$4270 million. These were divided as follows: railways 42%, roads 44%, ports and inland waterways 10%, airlines, airports, shipping and pipelines 4%. Bank loans and IDA credits usually provide the foreign exchange component of projects financed, and amount on average to less than 50% of the total costs of projects. The aggregate investment undertaken to date is therefore in excess of \$26 000 million.

Projects Department

18. Each project financed by the Bank or IDA is subjected to searching scrutiny. Investigations are made of the economic, technical, managerial, organizational, commercial and financial aspects of the project before a loan or credit is negotiated. During the construction and procurement stage of a project supervisory visits are made and, after completion, the Bank continues to be interested in the borrower's progress. Most of these activities are carried out by the Projects Department.

19. The Projects Department, employing a total of over 200 professional staff, is divided into four divisions: Agriculture, Education, Public Utilities and Transportation. The Department has also recently assigned responsibility for following developments in the field of tourism to the Transportation Division. This division deals with airlines, airports, canals, highways, pipelines, ports, railways, fishing harbours, sea defences, shipping and waterways, and has made loans for most of these categories. It is grouped into three operating sections: Highway, Port and Railway, which employ a total of 28 professional staff (mainly engineers). An additional 30 professional staff are employed as transportation economists, financial analysts, and in the technical assistance activities of the division. Consultant firms and individual experts are retained if and when needed.

Transportation Division: Port Section

20. The Port Section's responsibility is for canals, ports, shipping, waterways and pipelines. In the categories of ports and waterways, a total of 37 loans or credits, aggregating \$439 million, has been made (see Appendix 3).

21. To illustrate the activities of the Port Section and give some indication of the procedures and criteria involved in evaluating projects, the progress of an imaginary, normal-to-optimistic example of a port project is given.

22. A Bank economic mission has recently visited and reported favourably on the member country. Its government is stable and its planning organization has evolved, from sectorial surveys and careful project selection, a realistic national development plan embodying well-conceived ideas as to how best to apply the country's limited resources to give the maximum possible sustained development. The development plan incorporates the result of feasibility studies on which consultants have been employed. In this plan, the transport sector is, as is often the case, the largest (15-25%) in the total public investment, of which port development may form a relatively small but crucial part.

23. The Area Department has indicated to the Government the Bank's willingness to consider the port project for financing and has passed on any relevant papers to the Projects Department for consideration and possible

appraisal. The data submitted to the Bank are reasonably complete and an appraisal mission is scheduled. Sometimes a questionnaire is sent to the appropriate ministry and/or the port authority asking for additional information.

24. Information required includes:

- (a) the location of the port in relation to the transportation network of the country and other ports;
- (b) a physical description, giving number of berths, etc., cargo-handling equipment, ship-loading/unloading installations, floating craft, etc.;
- (c) past traffic statistics, showing the number and types of vessels and the annual tonnage of cargo for each of the last five years, separating bulk from break-bulk and liquid and dry cargoes, and indicating main commodity groups;
- (d) future traffic projections, annually for the next five years broken down by commodities, and for about ten years thereafter on a more general trend basis;
- (e) operational information, such as berthing procedures, ship turnaround time, productivity of port labour, etc.;
- (f) port dues and charges, including storage, stevedoring, lighterage, equipment hire, etc.;
- (g) financial information, balance sheets, income and expense statements for the past five years, projections for the next five years, and the trend thereafter for five additional years;
- (h) an estimate of the project cost, broken down to give local currency and foreign exchange requirements and the basis of the estimate;
- (i) economic information, statement of main benefits to be derived from the works and equipment.

25. The above information is expected to be prepared prior to the departure of an appraisal mission. This wish is not always realized, however. The mission normally consists of an engineer from the Port Section, a financial analyst, and a transport economist. The appraisal mission takes about 3-4 weeks in the field and some 4-6 weeks for discussion and report writing in the Bank. Should the commodity forecast need additional study, this may involve the Bank's Economics Department carrying out a detailed investigation of the world market prospects of that particular commodity.

26. On the economic side of the appraisal, increasing use is being made of sensitivity analysis to determine the effect on the rate of return of variations in certain components of the project's cost, fluctuations in traffic growth, and differences in the estimates of unit benefits. Also, should the Bank staff be not sufficiently expert on a particular aspect of the project, a consultant may be engaged to advise on, for instance, the amount of ore reserves of a mine supplying the minerals for export, berthing requirements of hovercraft, the hydraulic characteristics of a half-constructed breakwater, or the effectiveness of a radio-location fixing system. Such additional investigations, of course, take time, but if they are not required, a first draft appraisal report can reasonably be expected some 8-10 weeks after the mission's arrival in the field. A further month or so may be required before the draft is cleared through the section and division, and a modified report is sent for Working Party consideration. The Working Party modifications are usually limited to legal and

financial matters so that, within a further 2-3 weeks, the report can be submitted to the Loan Committee for consideration.

27. If approved by the Loan Committee, representatives of the member government and the port authority are invited for negotiations. These arrangements may take a further 2 weeks, so that some 4-5 months may elapse, in the case of a smooth operation, from the arrival of the appraisal mission in the field to the arrival of the borrower's negotiating team in Washington. A typical team may consist of a representative of the Ministry of Finance and/or of Transport, a government lawyer and the Chairman and Chief Engineer of the port authority, but the actual composition may vary with the problems likely to be encountered during negotiations. These might range from changes in the administration, tariff revisions, accounting improvements, modifications to the scope of the project, etc.

28. On completion of successful negotiations, the report is again modified and is presented to the Executive Directors for their consideration and decision. Upon receipt of the approval of the Executive Directors, the port authority as borrower and the Government as guarantor are invited to sign the loan documents and complete the necessary requirements to make the loan effective. Copies of the documents are then registered with the UN.

Port projects: some considerations

29. The Bank takes considerable care, and so far has been remarkably successful, in ensuring that the projects it finances will be financially viable and yield a good economic return. It is not only interested in the prospects of loan repayment but also in financing projects that will best contribute to the development of its member countries.

30. Each port project is considered on its merits and in its own particular context, but the following general considerations are likely to be in the minds of the members of a Bank appraisal team.

Port organization and management

31. The Bank does not consider any particular type of organization as the 'be all and end all' of port administration and operations. However, over the years its experience has been that a full or quasi-autonomous type of port authority, with representatives of port users on the board, subject to government budgetary, planning and policy control but with the maximum degree of freedom in day-to-day operations, gives the best results. The Bank has assisted in the setting up of the Port Authority of Thailand, the Callao Port Authority, the Israel Ports Authority, the East Pakistan Inland Water Transport Authority, and the Tunisian National Port Authority, among others.

32. A good manager can make something out of a poor organization but bad management will soon be reflected in an impaired port operation. The Bank has found, for example, that customs departments, from the nature of their main function (assessing and collecting duties), are not suitable vehicles for operating a port. However, port authorities should clearly co-operate actively with customs authorities both to facilitate the latter's task and to evolve methods of cargo clearance suitable for the container age. The Bank has been working with the Government of Iran in transferring the function of

cargo handling and storage from the authority of the customs to a port and navigation organization specially set up for this purpose.

33. When the Bank is in doubt about the ability of a port authority to do its own engineering, it insists, as a condition of financing, on engineering consultants being employed. Consultants are also frequently employed to improve management, operational and accounting procedures.

Port finances

34. The Bank considers ports as revenue-earning entities and expects them to make a reasonable return on the net fixed assets employed. A reasonable return may be 6% or more, after deductions for depreciation and before service of debt. Port charges should pay the cost of services performed so as to discourage an inefficient allocation of national resources which, in turn, would prevent a maximization of national benefits. The reasonableness of the return is generally determined by the financial needs of the port. These include adequate working capital, contributions to reserves, interest on and amortization of debt, and a material contribution to capital investments. Port authorities should concentrate on the business of port planning, constructing, maintaining and operating, and should not become too heavily engaged in finances and real estate not connected with the port.

Economic considerations

35. In all Bank appraisals considerable attention is given to the economic aspects. The estimated future economic benefits are calculated. These may include the economies of using larger ships, more efficient cargo handling, reduction of labour force, increased productivity of labour, reduction in ship waiting and turnaround time, elimination of lighterage, reduced damage to cargo, reduced insurance premiums, elimination of surcharges placed on a congested port, reduced pilferage, faster movement of goods through the port with a resulting reduction of capital tied up in goods in the transportation 'pipeline', etc. This is not to suggest that the benefits listed are additive or available in all cases. The calculated benefits are summed and compared with the estimated cost of the project and a discounted rate of return is obtained. This may be used as a basis for comparison with alternative investments, perhaps outside the transport sector.

Port operations

36. The operations of no two ports are alike. It is difficult, therefore, to lay down general yardsticks for productivity. However, in the developing world, a good rate of handling break-bulk general cargo is 140-150 000 ton/year per berth. This should only be considered as a rough rule of thumb, as it depends on variables; for example, the workability of ships' hatches, the number of shifts operated per day, the availability of appropriate mechanical handling equipment, the congestion or otherwise of transit sheds and storage areas, seasonal peaks of vessels and cargo, tallying of cargo, bonuses to labour, the rate of customs clearance, etc. Nevertheless, it is a reasonable target to expect port authorities in the developing world to aim for.

Port engineering

37. The need for accurate cost estimates based on sound technical studies, including borings, hydraulic and meteorological observations where required,

and up-to-date rates for labour and materials is self-evident. It is worth emphasizing, however, that since a loan or credit is limited to a fixed amount and the borrower has an obligation to finish the project, the government is entering into an open-ended commitment. For this reason, among others, a realistic provision should be made for engineering contingencies and variations in the cost of labour and materials, even though consultants or port engineers are sometimes hesitant to do so. Again, while it may be thought trite to say that port layouts should suit the present and forecast traffic flow and be as flexible as possible to cater for unforeseen variations in volume and changes in the pattern of the traffic and in its mode of handling, much more emphasis needs to be given to the technological revolution taking place in all modes of transport which affect ports either directly, or indirectly by competition.

38. The Bank is at present engaged in studies to determine the optimum number of berths of a port and the optimum depth of water that should be provided. Unless a positive case can be made for something smaller, a length of 600 ft and a depth of at least 32 ft at mean low water would seem appropriate for present day, break-bulk general cargo berths. For containerized general cargo berths the possibility of 'in line' construction, combining, say, three standard 600 ft berths to accommodate two large container vessels, should be borne in mind and such berths should be designed so that future deepening to at least 35 ft is possible. For modern bulk, dry-cargo vessels depths of at least 45 ft are expected. While the limits for bulk oil tankers seem to be only that of designers' visions, the monsters now afloat or scheduled for service can normally be expected to load or unload in deep water at the end of a long causeway or submarine pipeline.

Development plans and sector studies

39. An important consideration borne in mind during the Bank's rigorous vetting of a project is how the project fits into the overall development goals of the member country. Many countries have development plans which reflect their aspirations and intentions, and these are frequently broken down into medium-term plans for a period such as five years. One advantage is that a more manageable, comprehensive package then results, which can be financed by annual appropriations from the national budget. Unfortunately the data on which development plans are based are often insufficient, incorrect or even non-existent; the technical investigation may be inadequate and the cost estimates unrealistic, and inhospitable political and administrative environments sometimes make long-range planning impossible, and even short-term execution doubtful. The difficulties and perplexities which planners, macro and micro alike, have to face are many, e.g. the failure of the East African ground nuts scheme, the topping of cofferdams during the construction of the Kariba Dam, the 1966-67 droughts in India, the current Southern Rhodesian political situation, the Arab-Israeli conflicts and consequent closing of the Suez Canal, the separation of Singapore from Malaysia, the difficulties in Nigeria, to mention but a few. Truly, 'the best laid schemes o' mice an' men gang aft a-gley'!

40. A good overall development plan will identify suitable major sector developments. However, it is often the case that further study of the transport sector is required before a particular port project can be prepared with assurance

and proceeded with in reasonable certainty. While a cynic has remarked 'the road to inertia is paved with studies', the Bank has found well-prepared sectorial studies in transportation to be of great importance in determining economic justification and orders of priority.

41. Although the Bank has no set rules for carrying out sector studies or any particular format for their presentation, a comprehensive examination is expected to determine whether or not the project is viable and of high priority.^{1,2} Remarkably, this is the recommendation in many studies. In some cases the Bank may provide assistance in the preparation of suitable terms of reference for the studies, in locating financing from international agencies, in selecting consultants and in supervising the studies. In a few cases the Bank has financed port studies from its own resources, e.g. in East Pakistan, Iran and Somalia.

42. A typical feasibility study leading to a port project is likely to be regional in nature if the country is large, or national in nature if the country is small. International planning is desirable (especially for container ship facilities) but is often not practicable. Preferably the study is done by an independent agency (National Ports Council, Ministry of Transport, Plan Organization, etc.) or its consultants, removed from the individual ports involved, but of necessity working with them in the planning process. The study should not be deferred until an emergency arises and it becomes obvious that something must be done. One of the most difficult problems that the study team has to solve is that of estimating the volume and composition of the future traffic of the project port, based on commodity movements in its service area. The team's task is often made more difficult by the lack of reliable statistics in the field but is often facilitated in the office, at the report writing stage, by the employment of modern analytical techniques and probability analyses.

43. The feasibility study should always clearly state the assumptions made—after all, we are planning in an environment of uncertainty—and should adequately describe the alternative solutions that have been rejected. The recommended solution should be the one that gives the lowest total of distribution and transport costs. Any worthwhile solution will depend on many factors, including the relationship of the project port to the country's transportation system, the ability of any existing ports to handle the traffic or to be modified to do so, the suitability of the proposed site for low-cost construction and future expansion, the advisability of building to full capacity now and benefiting from the economies of scale or of adopting construction by stages, the possibility of technological changes in cargo-handling and changes in the pattern of trade (e.g. containerization of general cargo, fewer vessels of increased draught and cargo-carrying capacity), the interest rate used to discount the estimated capital and future maintenance costs and the quantifiable benefits to a present value, the operating costs of the new facilities (e.g. an alongside operation compared to lighterage, mechanically intensive versus labour intensive), and so on. A well-balanced presentation, evidencing common sense and good judgement, combining the theoretical with the practical approach, should be the objective.

44. In the past many fine ports were built successfully and located correctly without the benefit of modern analysis. This may give the engineers a sense of pride but also a smugness. New tools are available for our use and we

should use them. We should be more receptive to our economist friends and their 'with' and 'without' approach to solutions, their 'cost-effectiveness', discounted cash flows and other techniques. We must not take too limited a view of things. The rigorous questioning of old established and proven ways of port engineering, although at times frustrating to those anxious to 'get on with the job', may ultimately be the way in which there are jobs to get on with.

Role of the consultant in Bank projects

45. It may well be that the 'average engineer', having read the many facets of project appraisal described above, will exclaim 'This is not for me!', or for the senior partners of the 'average engineering consultant firm' to reiterate 'We are engineers, and have been since 18--: let's stick to what we know.' I have heard both phrases used in London. Engineers should not be dismayed that the changing approach to studies is not 'pure' engineering, or be deterred by the frustrations of language, culture, and, perhaps, religious differences likely to be encountered overseas. I am happy to note that in recent years engineers have been widening their horizons and consulting firms have been hiring economists and other specialists directly or have been making joint venture arrangements with firms employing such experts. For its part, the Bank tries to ensure that more and more consultants are employed. This has often meant competition for old-established consultants. While it is understandable that they have not appreciated it, it has been on balance a successful stimulus to change and innovation.

46. How is a firm of consultants retained by the Bank or by a Bank member country for a port study or port project? In the case of direct employment by the member country (or one of its port managing entities) it is simple; the consultant goes after the business. Again, while the idea of selling may be anathema to some traditionalists, the world has become competitive. In such cases, the Bank is not directly involved in the selection of the consultant but has the right of approval of the borrower's choice, and only approves if it considers the consultant selected as likely to perform satisfactorily.

47. Where the Bank acts as executing agency for the UNDP or pays for the work from its own technical assistance funds, the consultant is selected by the Bank in agreement with the member country. From its comprehensive files* the Bank selects some four or five firms from different member countries known to have experience, skill and proficiency in the type of project being considered, and invites proposals from them. The proposals are carefully and impartially evaluated, with attention paid to the scope of the work; the proposed plan of execution; the time senior partners will devote to the work; the experience and qualifications (including languages) of those to be employed in the field and in the office, particularly the project manager; the ability of the firm to carry out the work promptly; other current commitments; and also whether the work is to be done using the firm's own staff. The initial proposals are not expected to give a cost estimate of the services sought, as cost is not considered the most important yardstick.

48. The best-qualified firm, chosen tentatively, is asked to submit its financial proposal and is then invited to discussions in Washington. If the

overall proposal is satisfactory after these discussions, and the costs are reasonable in relation to the services to be provided, a contract is signed with the Bank after clearance by the member country which is represented at the discussions. There are often advantages in asking the same firm that carried out the feasibility study, which includes preliminary engineering, to prepare the detailed designs, contract documents, etc., for the final engineering, and also to supervise the execution of the project. The aggregate amount of contracts awarded to engineering consultants in connexion with projects financed by the Bank and IDA ranges between \$50 and \$100 million/year.

49. British consulting engineers have a wealth of experience and competence in port engineering. Their ability and integrity are well known. However, they are less aggressive and more sensitive about 'drumming up new business' than the consultants of some other countries. In the past, much of the world has beaten a path to Victoria Street. Today, in order to maintain its position of eminence, 'Victoria Street' has to go to the world, shed a lot of its conservative ideas, become more active in contacting new clients and more competitive in obtaining new business. The Bank is one of the greatest friends of the engineering profession. It is interested in seeing that high standards of professional competence are maintained, that member countries get good value for their money and that consultants are fairly treated and suitably rewarded for their services. Consultants must be prepared to give a client unwelcome advice—to recommend rejection of a non-meritorious project, even when such advice means the end of the consultant's contract. The Bank is also interested in seeing that contractors get a fair deal.

Conclusion

50. The activities of the World Bank Group and in particular those of the Transportation Division in the realm of ports have been described. The Bank has been referred to as a beneficiary of the 'brain drain' but the flow is not all one way. The skills of the Bank's staff of many nationalities are employed to the benefit of all members of the Bank group; the services and manufactured products of the 'haves' are directed to the urgent needs of the 'have-nots', to the mutual betterment of all. As an international co-operative organization, the Bank group is frequently in a unique position to act as a catalyst in helping member countries—its voice is often heeded when others are ignored. Transportation, be it by rail, road or water, forms the modern sinews of any nation's economy and is in great need of improvement in most countries.

51. Engineers have an important role to play and there is an ever-increasing need for their services, their ingenuity, and their ability. The hopes, aspirations and intentions of millions in the less developed nations of the world highlight the magnitude and urgency of the task. The World Bank group can, with plain common sense leavened by some idealism, also play a useful and important part in this great endeavour. It is hoped that, in the final analysis, it may be said of the World Bank that it truly was the friend of the civil engineer in that it greatly helped him in achieving his objective of 'directing the great sources of power in nature for the use and convenience of man'.

* Details of about 1800 firms of consultants are presently on record.

Appendix 1. IBRD: Financial and operating data by fiscal year (1) (actual through fiscal year 1968 and preliminary forecast for fiscal year 1969, in \$ millions)

	Through 1961 (2)	1962	1963	1964	1965	1966	1967	1968	1969
<i>Balance sheet</i>									
Cash and securities	1407	1797	1738	1589	1595	1417	1305	1167	1550
Receivable from loans	2931	2979	3185	3472	3831	4226	4751	5215	5667
Receivable from subscribed capital	468	449	436	437	465	509	502	479	449
Land and buildings	12	18	21	21	21	23	24	29	36
Accruals, prepayments and other assets	61	71	79	79	95	103	118	125	139
Total assets	4879	5314	5459	5598	6007	6278	6700	7015	7841
Due to IDA				50	115	154	102	116	125
Funded debt	2228	2521	2519	2492	2724	2806	3075	3290	4005
Miscellaneous liabilities	34	43	46	42	43	49	53	59	73
Capital and reserves: (a) Special reserve	194	224	255	288	289	290	290	291	291
(b) Retained earnings (3)	408	476	558	606	668	732	892	965	1053
(c) Paid-in capital (4)	2015	2050	2081	2120	2168	2247	2288	2294	2294
(d) Total	2617	2750	2894	3014	3125	3269	3470	3550	3638
Total liabilities and capital	4879	5314	5459	5598	6007	6278	6700	7015	7841
<i>Income and expenditure</i>									
Income from (a) securities	207	54	59	62	62	63	72	66	75
(b) loans	936	163	175	189	205	227	256	284	325
Other income	6	1	1	1	1	2	4	7	8
Gross income	1149	218	235	252	268	292	332	357	408
Admin. exp. and development services	98	13	16	19	22	30	31	34	40
Interest on borrowings	432	97	102	100	106	116	129	151	191
Financial expenses (5)	17	10	4	2	2	6	2	25	2
Gross expenses	547	120	122	121	130	152	162	210	233
Net income (6)	602	98	113	131	138	140	170	147	175
<i>Memo items</i>									
Number of commitments	292	29	28	37	38	37	47	44	71
Amount of commitments to (a) countries	5791	882	449	810	1023	839	777	847	1200
(b) IFC							100		
Undisbursed loans held by IBRD (7)	1096	1470	1245	1488	1663	2085	2261	2001	2381
Repaid to IBRD on loans	438	104	113	117	137	166	188	236	292
Disbursed on loans (8)	4320	481	615	558	606	665	783	765	820
Borrowing by IBRD: new issues	3592	271	121	100	598	288	729	735	1078
Less debt retirement	1168	167	126	132	348	224	225	520	520
Net borrowing	2424	104	-5	-32	250	64	504	215	558
Increase or decrease in 'cash'		+390	-59	-149	+6	-178	-112	-138	+383

Notes

- (1) Balance sheet data are as of the end of each fiscal year.
- (2) Balance sheet entries, including related memo items, are as 30 June, 1961; other entries are totals up to that date from 25 June, 1946.
- (3) Transfers to IDA have been charged to retained earnings in the year in which such transfers were 'earned'. Data for end of fiscal years 1968 and 1969 assume transfers of 50% of net income.
- (4) Capital subscribed but not called was \$20.6 billion at 30 June, 1968.
- (5) Financial expenses include amortization of bond issuance costs, discounts on sales of loans, and net losses from devaluation of funds held (\$23 million in fiscal year 1968). The auditors recommend that devaluation losses be charged to retained earnings rather than treated as a deduction from net income.
- (6) Net income is calculated before allocations to special reserve.
- (7) Undisbursed amounts do not include commitments not yet effective. These amounted to \$371 million at 30 June, 1968.
- (8) Disbursements are net of exchange adjustments.

Appendix 2. World Bank loans and IDA credits by purpose and area (cumulative total at 30 June, 1968 in \$ million)

	Total	Africa (excl. N. Africa)	Asia	Australasia	Europe	Western Hemisphere	Mid-East and North Africa
Transportation	4 270	621	1 720	181	505	847	395
(a) railroads	1 789	289	906	79	272	175	67
(b) roads	1 894	287	619	51	127	626	185
(c) shipping	12	—	—	—	12	—	—
(d) ports and waterways	439	45	160	7	87	45	94
(e) airlines and airports	57	—	6	44	7	—	—
(f) pipelines	79	—	29	—	—	—	50
Electric power	3 949	434	784	182	616	1 846	86
Telecommunications	219	22	102	—	0.3	95	—
Agriculture, etc.	1 253	58	513	103	108	325	145
Industry	2 270	121	1 259	53	499	145	193
Water supply	108	1	61	—	4	38	4
Education	162	62	42	—	—	21	37
General development	205	40	—	—	90	—	75
Post-war reconstruction	497	—	—	—	497	—	—
Project preparation	3	2	1	—	—	—	—
Grand total*	12 935	1 362	4 482	520	2 319	3 317	935

* Does not include \$100 million loan to IFC.

Note: Amounts are given in round figures.

Appendix 3. World Bank loans and IDA credits: ports and waterways projects. Totals by countries (cumulative to 30 June, 1968)

Country	Amount US \$ million equiv.
Africa	
Congo (Belgian)	5.58*
Congo (Brazzaville)	11.60*
East Africa	5.00*
Mauritania	2.50*
Nigeria	13.50
Ruanda Burundi	2.10*
Senegal	4.00
South Africa	1.18*
Total: Africa (excluding N. Africa)	45.46
Asia	
Thailand	7.66
China (Taiwan)	2.18
India	75.19
Pakistan	38.94
Burma	13.94
Philippines	7.38
Singapore	15.00
Total: Asia	160.29
Europe	
Belgium	30.00
Spain	40.00
Turkey	16.30
Yugoslavia	0.60*
Total: Europe	86.90
Middle East and N. Africa	
Israel	27.41
Sudan	3.20
Tunisia	6.99
United Arab Republic (Suez Canal)	56.50
Total: Middle East and N. Africa	94.10
Western Hemisphere	
Ecuador	13.00
Honduras	4.80
Nicaragua	3.20
Paraguay	3.19
Peru	21.19
Total: Western Hemisphere	45.38
Australasia	
New Zealand	7.11
Grand total	439.25

* Part of a multipurpose loan.

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The World Bank and port development

A. J. CARMICHAEL

Mr Carmichael

The period between writing the Paper and presenting it saw considerable changes in the Bank, reflecting the influence of the new President, Mr Robert McNamara. The number of projects under consideration doubled over the past year, and we have had to expand our staff to handle this increased workload. Gross borrowing during the first nine months of 1969 was \$1100 million. We have a five-year projection for our lending operations. The five area departments referred to in the Paper have been increased to six; the port section has been upgraded to the Ports and Pipelines Division. During the fiscal year ending 30 June, 1969, we hope to make nine loans amounting to \$144 million. This would make a grand total of 46 loans aggregating \$584 million for the Division.

53. During two recent project appraisals we developed a mathematical model to simulate operations of ports and assist in determining the best project under given conditions. The Bank has prepared a paper entitled 'The optimum number of berths of a port', and is presently working on one dealing with the optimum depth.

54. I should like to draw attention to the Pearson Commission established in August 1968, when Mr Lester B. Pearson, the former Prime Minister of Canada, accepted Mr McNamara's invitation to head an independent international commission to examine the progress and problems experienced in the field of international aid and development assistance. This commission hopes to complete its report in September 1969.

55. Bank membership now totals 110 member nations and IDA 102. Our total loans and credits to 31 December, 1968, were about \$14 000 million; during 1969 lending will be about \$2000 million and in 1970 about \$3000 million.

Mr D. C. Coode, Coode and Partners

In § 17 of Mr Carmichael's interesting Paper it is stated that the foreign exchange component averages less than 50% of the total cost. Is this the average for all transportation projects and has the Author a separate figure for port projects? My experience on three recent port projects is that the percentage is between 60 and 70.

57. He has stated that in developing territories the rate of handling general cargo is between 140 000 and 150 000 ton/year per berth, and I assume he is referring to a berth length of 600 ft. While I cannot draw on as many examples as Mr Carmichael has available in the Bank, I would have expected the figure to be nearer 180 000 ton/year per berth, and I would be interested in his comments on this figure.

58. At the end of § 37 the Author states that more emphasis needs to be given to the technological revolution taking place in all modes of transport which affect ports by competition. This is true, but who 30 years ago would have anticipated hovercraft, jumbo jets, 200 000 ton oil tankers or even container ships? With such rapid changes and developments it becomes increasingly difficult to prepare in more than generalities, port development plans for more than a few years ahead.

59. It is, of course, right and proper to indicate where berths can or should be built to cover the anticipated increase in traffic, although I would question the accuracy of any figures purporting to forecast traffic beyond the next 10-20 years, but how can anyone forecast what will be needed and what it will cost in 50 years' time? Some startling and as yet unknown design may be devised, the cost of construction of which is anybody's guess. Even the way in which import cargo may be removed from the

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port or export cargo brought to it in 50 years' time cannot be forecast now. Does Mr Carmichael agree with these views, and if not in what way does he differ?

60. The figures in § 38 of 600 ft berth lengths and 32 ft depth at low water have, of course, been the yardstick for a number of years, but I am somewhat surprised at Mr Carmichael's suggestion for a design depth of at least 35 ft for future container ships. When considering the design and cost of a berth, especially if dredging is necessary both alongside and in the approach channel, there is quite a difference between a depth of 'at least 35 ft' and one of 40 ft. The first of the two container ships for the Europe-Australia service draws 35 ft, and allowing for clearance under the keel, some periodical silting at the berths and exceptional tides, I would have thought that a depth of 38-40 ft alongside seemed advisable. My firm are currently engaged on the design of some container berths for two ports and the World Bank have asked us to design for a future dredged depth of 40 ft.

61. In § 47 the Author has explained the system adopted by the Bank in evaluating proposals. It requires such firms to name the individuals who will be engaged on the project both in the office and in the field; it is, to say the least, difficult to state that Mr X or Mr Y will be employed on this work when it is not known when the assignment will start, whether other assignments have been obtained meantime on which the proposed persons will be employed, or whether in fact Mr X or Mr Y will still be with the firm. I suggest that since it is the firm that is being selected to undertake the assignment, and since no doubt all firms organize their work in different ways, to give the names of individuals and the time to be spent by senior partners cannot be of any great value to the Bank. The partner handling the assignment can call on the expertise of his fellow partners and the senior staff, and any report submitted is the collective responsibility of the partners.

62. With regard to the remarks in § 49 on drumming up new business, I presume Mr Carmichael is not suggesting that as Corporate Members of this Institution we should ignore the rules of professional conduct laid down in By-law 29.

63. The Bank may well be a good friend of the engineering profession but, if I may say so, it must ensure the fair treatment to which Mr Carmichael refers. I am sure he would agree that when disagreements arise between the Client and the Consultant on a World Bank-financed project, then the Bank should hear the Consultant's side of the argument first-hand and should not make its judgement solely on information received from the Client.

64. Finally, Mr Carmichael has made a categorical statement that the Bank is interested in seeing that the consultants are suitably rewarded for their services. I would be interested to know how the Bank tackles this problem, bearing in mind that neither the consultants nor, in fact, the contractors, get paid until the borrower has certified the account for payment by the Bank. It is of little comfort to a consultant to be told that he will eventually get paid but it may take a long time. Consultants do not have unlimited working capital and under the existing tax regulations their profits are assessed on accounts submitted, whether paid or not, and they would hope for reasonably prompt payment.

Mr V. H. Gritton, Sir William Halcrow and Partners

I congratulate the Author on submitting a Paper which has, I am sure, been of great interest to engineers who are at present dealing with World Bank matters, and also to those who are hopeful of doing so in the future.

66. In § 10 of the Paper it is stated that 'by 30 June, 1968, subscribed capital had risen to over \$22 900 million'. In Note (4) of Appendix 1 it is stated that 'capital subscribed but not called was \$20.6 billion at 30 June, 1968'. However, in the final column, for 1969, the figure of \$5667 million is shown as being receivable from loans. This seems a small proportion of the capital subscribed. In § 18 it is said that the Bank only makes a loan after it has satisfied itself thoroughly that the project is a sound one technically and an economically viable proposition within its own rights.

It is also stated in § 29 that all projects financed by the Bank have proved to be successful. I would suggest that it is possible that the Bank may be somewhat more cautious than it need be in its assessment of the viability of a project, and that if it relaxed on some of its requirements a greater use of its subscribed capital could be made than approximately 25%, which the figures in the Paper seem to show.

67. The Bank is clearly right in trying to ensure that whenever possible ports should be revenue-earning entities which can make a reasonable return on the assets employed. However, I am wondering whether too much emphasis is being given to this criterion compared with the wider aim mentioned in § 29, that is, the promotion of projects that will best contribute to the overall development of the member countries. Furthermore, some consideration should also be given to the advantages to the general world pattern of transportation links.

68. Bearing in mind that even in the more developed countries some ports find it very difficult to make a profit, a target of a return of 6% or more may be too ambitious for a developing country. Many possible economic benefits are listed in § 35, but these are all specifically related to costs of transporting goods to and through the port. A major port improvement can often stimulate the economic expansion of the whole country in many ways, and I should like to know if any numerical values are available for such benefits when the discounted rates of return are calculated. I feel that the effect on the whole of a country as a result of building either a seaport or an airport should be given a great deal of attention when considering the viability of the scheme.

69. In § 37 it is stated that 'a realistic provision should be made for engineering contingencies and variations in the cost of labour and materials'. Provided that satisfactory site investigations and surveys have been carried out I see no real problem in making a realistic provision for engineering contingencies but when it comes to considering variations in the cost of labour and materials, in other words, inflation, there is a very different problem. The Author has given an idea of the timetable involved in preparing a World Bank financed project. He has admitted that the periods can be much longer and many of us have had experience of delays of several years while the borrower country is making up its mind whether it can proceed with the project. Changes of government sometimes occur which affect these decisions and it is almost impossible for an engineer or an economist to put forward figures which he would be confident are an accurate forecast of the total cost of the project.

70. I suggest that when a consultant puts forward his estimates with realistic engineering contingencies included he should add a statement to say that the estimates are based on the works proceeding within a specifically stated period of years. He should also state by how much the estimate should be increased per year of delay in either getting the works started or in completing them. The Bank should be prepared to increase its loan to cover a proportion of the increase. In this way neither the Bank nor the country applying for the loan would have a completely open-ended situation, and at the very least they would know the cost of delays. This might produce decisions somewhat sooner.

71. Four or five consultants may be asked to prepare proposals for studies. The Bank has to consider all these proposals and one consultant is chosen. A fair amount of money will have been paid by the consultant to prepare his study. Would it be possible for the Bank to have a fund so that the unsuccessful consultant might be rewarded for having done a job which may contribute something to the final project when the Bank is considering the scheme of the successful consultant?

Professor D. M. McDowell, Manchester University

Several years ago I was privileged to work on a project with which the World Bank were closely associated. I worked first of all for the United Nations Technical Assistance Organization and later as an employee of a potential customer of the World Bank. This gave me an opportunity of seeing both sides of the preliminary inquiries

into a port project carried out by the World Bank, and it was a fascinating and valuable experience.

73. In his Paper Mr Carmichael has outlined the stages of the investigation of a project and made it look remarkably easy. This might be the case when there is an application for an entirely new project, in virgin territory, where large decisions can be taken without too many interested parties, but when the case involved is that of a well-established port, many factors come into it—politics inevitably and the personalities of the people concerned, their ingrained habits of working, etc. All these come under the close scrutiny of the Bank. The effect of this on the customer is considerable and very beneficial, even though he may not get the money in the end.

74. Mr Carmichael made out a case for engineers to take a wider view of their responsibilities. In the past, port developments could be based on quite simple considerations and engineers could play a major role in planning. With modern technology it is becoming more important and more advantageous to carry out comparative studies of alternative schemes. Not only are technical improvements very considerable but the whole situation of ports has changed. Methods of transit, communications generally, methods of cargo handling, have all altered so much that the hinterland of a port and its interaction with the community have to be taken into account in a much broader manner than hitherto.

75. This raises a matter which is in the minds of many people at the present time, that is, the role of the engineer and how he should be trained to meet that role. Fifty years ago an engineer could initiate a scheme, design it, cost it, supervise its construction. Now he has to work much more closely with politicians, administrators, and economists, in evaluating a scheme, and his share in the final job may be a very much smaller proportion than we would like it to be.

76. If an engineer has the traditional training of three years at a university and three years' post-university experience as a minimum, he will be forced to rely increasingly on the advice of professionals in other fields—economists and such people. His role has degenerated already in many cases, to that of a high grade analyst and supervisor of engineering construction.

77. It is increasingly hard to get good students, for somehow the image of the engineer has been lost. If the engineer is to regain the initiative in planning and executing major works, he will have to acquire special skills or employ people who have had a training in these special skills—economics, management, administration, etc. If we are to train engineers in these skills so that they can talk at a professional level with specialists, we have to alter our educational system beyond its present straitjacket of a three-year undergraduate course. One way is to make the course a four-year undergraduate course, but I think the profession will have to look more and more for people who have taken additional courses, for example, in maritime civil engineering, in management, in economics, and it will have to reward people who have done these courses suitably for the extra time spent in training. We would then attract people into the profession who know that they will be rewarded for special skills.

78. At the moment there is a real lack of good university postgraduate courses. Those that are put on do not attract enough people. If the profession makes it clear that it will reward people and will co-operate with universities in deciding on useful objectives, then the universities will respond and produce useful courses.

79. In drawing attention to the need for professional engineers to become much more widely involved in planning operations, I think Mr Carmichael has done us a very great service.

Mr M. E. Gibb, Sir Alexander Gibb & Partners

I will concentrate, perhaps not surprisingly, on the section which deals with the role of the consultant in Bank projects.

81. To the consulting engineer the Bank represents stability, respect for integrity

and, up to a point, financial security. 'Up to a point' is not a criticism but merely expresses what Mr Coode has pointed out. There is one thing we particularly appreciate in the Bank's method of selecting consulting engineers: they do it without recourse to price-competitive bidding. This practice is becoming all too common and is even being attempted in the public sector in Britain. I think the Bank sets a shining example by refraining from its use. British consulting engineers object most strongly to it.

82. Unfortunately in the international field we are competing against many countries which do not belong to FIDIC. Are we to decline overseas invitations to quote terms and leave our prospective clients to go to some non-FIDIC country for the services he wants? Many of us conclude that we must to some extent take on our foreign competitors with their own weapons. We have the choice at least overseas—and it is a very critical choice—of liberalizing to some extent our approach to the ethics of price competitive bidding or of running the risk of a serious curtailment of our overseas work. I hope that these remarks will go some way to answering Mr Carmichael's challenge in § 49, where he advocates a more aggressive attitude to getting new work.

Mr N. N. B. Ordman, Port of London Authority

I have a particular pleasure in commenting on the excellence of Mr Carmichael's Paper and in congratulating him.

84. I find all the Paper extremely interesting and very welcome. (It is easy for me to say this because I am not a consulting engineer.) But the section of the Paper which has most closely engaged my attention is that which deals with development plans and sector studies (§§ 39–44). There have been many discussions in the Institution about the nature of port planning, and there has been broad agreement that these plans are now so comprehensive in their character that port engineers must and do link up with administrators, operating managers, and other specialists, including occasionally economists, in order to ensure that all aspects of the plan are examined and properly integrated.

85. There is one particular aspect of this process which I would like to discuss briefly and on which I would welcome Mr Carmichael's comments. He says that plans or feasibility studies should not be deferred until an emergency arises requiring panic measures and from this I infer that what he is really advocating is that the planning process should be continuous. If this is correct I am very fully in agreement, and I think this particular point needs to be stressed.

86. All port development plans must be based on some assessment of the future levels of traffic, of the nature of future traffic and of the operations that will be carried out in the port. By their very nature these assessments contain a large element of uncertainty, and this element increases as the time span of the plan lengthens. It is therefore essential that forecasts be constantly reviewed and revised, and it follows that the plans for physical development, the plans for the installations which will cater for this development, must be constantly reviewed and revised. This seems to me to be an unassailable demonstration of the need for continuity in planning. In Britain we have suffered from a lack of continuity in planning, so that there were long periods of inactivity followed by desperate bursts of feverish, hasty planning and construction. I think this situation is better now than it has been.

87. It is comparatively easy in developed countries for port authorities, government departments, etc., to provide within their organizations suitable machinery to produce this continuous review of development and to develop continuous planning arrangements. It must be very much more difficult to make such arrangements in developing countries simply because of the paucity of suitably experienced and trained people. Yet the need is probably greater in developing countries than it is in developed countries, and if some sort of continuous machinery is not available we will certainly get the sort of situation which Mr Carmichael says we should seek to

avoid. This, it seems to me, goes to the heart of technical aid. It is not sufficient that the developed countries should assist developing countries by propping them up periodically or by giving them occasionally spasmodic injections of financial or other aid. What we should be doing is fostering the development of domestic technical expertise in these countries, so that in due course, by building up their local economies and resources, they can achieve true independence.

88. I imagine that the sort of encouragement and aid which I have been describing is more properly the function of international agencies other than the World Bank, but it would seem to me that, if only as a means of securing their investment, this is a matter which should engage the attention of the World Bank, and I should be glad to hear if in fact it does.

Mr J. D. Mettam, Bertlin and Partners

Mr Carmichael and his colleagues in the World Bank have done an enormous amount to develop the systematic planning of ports, particularly in developing countries. Sufficient attention has not yet been paid in Britain to the sort of appraisal of port development that Mr Carmichael has outlined. We cannot afford to neglect this approach. Can Mr Carmichael confirm that Britain is the only country which exercises strong central national control over the planning of ports and bases that control not on national economic benefits but on the very narrow assessment of whether the development will produce a profit to the port itself? This neglects the most important benefits from port development and also assumes that the ports are not capable of working out their own finances.

90. Perhaps what is needed in Britain is for one of our ports to apply for a loan from the World Bank and have an appraisal by a World Bank study team. This would be a valuable exercise even though in the end we would not, of course, borrow any money from the World Bank for development.

Mr A. C. Carpenter, Sir Bruce White, Wolfe Barry and Partners

In § 34 it is said that the return should cover a material contribution to capital investments. Could Mr Carmichael tell us whether that is to set aside reserves for future capital investments of a major nature or whether this is merely an extension of the interest on amortization of debt?

92. What is the World Bank's policy with regard to the economic viability of this sort of major development? Is it that it will cover its own cost and merely set aside a small amount for reserves, maintenance, running replacements, small developments of plant, etc., or is it intended that the port dues should not only finance the present project but also be sufficient to build up a capital fund for future major projects?

Mr R. B. Hill, Cementation Construction Ltd

The title of the Paper is 'The World Bank and Port Development', but the Author and the speakers have considered only conventional ports.

94. My company has just completed the first international hoverport in Britain, and although I know little about hoverport operation, I do know that hoverports are extremely cheap to build compared with conventional port installations. Although at the moment hovercraft are not able to carry anything like the traffic transported by conventional shipping, when we extrapolate beyond the early hovercraft and the present SRN4, the situation may well be very different in not so many years' time.

95. How are we to plan for port facilities and installations, etc., if we do not know what logistic equipment and new ideas are going to be available?

96. The Bank should study this aspect of transportation, because in underdeveloped countries, where traffic is such that extensive conventional port installations are not viable having regard to return on investment, with a consequent hindering of the development of these countries, it is conceivable that a system could be developed

whereby normal cargo ships may be modified to act as 'mother' ships with hovercraft operating from them carrying containers. By this means, and with semi-navigable rivers, there might be surprising developments. The voyage of the SRN6 Hovercraft up the Amazon under the most extraordinary conditions is a good example. Bearing these points in mind, it seems to me that we may be on the verge of an entirely different and probably viable transportation system in advance of any with which we are at present familiar.

Mr A. H. Beckett, Sir Bruce White, Wolfe Barry and Partners

Mr Carmichael's Paper is of great help to British consultants and engineers, but I think he would help us still more if he explained how the Bank ensures that its projects are viable and yield a good economic return. He has revealed that a high proportion of the investments of the Bank are in railways, presumably in countries where population density is low and industrial development small. The Bank's railway investment is about half that of Britain's in modernizing her railways. Can he explain how the Bank is able to ensure a good economic return whilst British Railways seem to have difficulty in this respect despite a very high level of utilization?

98. He has given some very helpful advice to British consulting engineers to be more competitive in overseas markets. However, a Malayan newspaper has mentioned that there were 50 invitations to consulting engineers to tender for a particular job. Those are pretty high odds against any one of them getting the job.

99. Readers must have been very interested to see the scope of the information required by the Bank before it is prepared to enter into loan negotiations, and this information has to be prepared by the intending borrower, perhaps with the aid of a consulting engineer. Such information really can only be produced following a fairly comprehensive economic and engineering study which has to be financed by the intending borrower from his own resources. If these resources were ample he would not be going to the Bank for a loan, so it is quite obvious that consulting engineers secure such assignments in a very competitive field. I hope Mr Carmichael and his advisory officers will recognize that in these cases a consulting engineer has an investment in the project.

100. There must be many consulting engineers whose experiences in working overseas leave them making a comparison of the Bank's interest rate of 6½% with their own fees which they get for the responsibility of providing economic advice, preparing design drawings and contract documents, and taking full responsibility for the success of a major project. A consulting engineer may get a fee of this order, but the Bank is getting 6½% every year of the 25% loan! Should we wonder that some of our best engineers turn their efforts to the banking side of engineering?

Mr J. B. Dalman, Sir William Halcrow and Partners

In § 8 the relative contributions to the Bank's finances of some of the member countries are given. The United Kingdom contributes over 10% of the total, which is more than France and Germany combined. Can Mr Carmichael explain how the ratios have been fixed and whether the proportions of work assigned to consulting engineers in the member countries bear any relation to the size of the financial contributions made?

102. As an engineer does the Author consider that engineers are represented in adequate proportion in the Bank's total strength?

103. The number of berths to be provided in a port must be a prime concern of the Bank appraisal team. It seems to me that one of the most important factors affecting the rate of handling break-bulk cargo and the need for berths is the number and length of ships operated per day. Has the Bank been successful in persuading any existing port authority to change its system of working, or to institute double shift working at a new port?

104. With regard to § 37, it is gratifying to have confirmation that the Bank will support proposals for the necessary boring, hydraulic and meteorological observations. Such investigations will not only make it possible to estimate costs of schemes more accurately but, much more important, they will facilitate the right sort of choice at the project stage.

105. I understand that in general the Bank prefers that consultants should arrange for their team members to work either full-time, or at least for substantial periods, on Bank projects, overseas and in head office. Furthermore, I believe that it is often considered desirable that the consultant's report should be written in the member country. The Author has mentioned particularly that when evaluating proposals for consultants, attention is paid to the time senior partners devote to the work. It would seem to me unlikely that, except for a project of really major importance, a senior partner of a large firm would be engaged on a study abroad for long periods. Am I right in assuming that the Bank welcomes proposals, including relatively small contributions from partners and senior head office staff, some of whom may not have the opportunity to visit the country concerned?

Mr P. W. E. Holloway, Holloway Brothers

From the contractors' point of view I would like to say that we are particularly interested in the use of the International Form of Contract, which is issued under the sponsorship of FIDIC and the International Federation of Building and Public Works, the international contractors' organization.

107. Recently the contractors' organization has split into three international groups. There is one for Europe, which is the original one founded in 1907, and two new ones, one in Asia and Western Pacific areas, and the other an inter-American federation. Through the auspices of our European federation we are endeavouring to persuade the other two contractors' organizations to adopt the international conditions as we know them, and which I am glad to learn are being used by the World Bank. FIDIC on the consultants' side operates throughout the world, and we are endeavouring to see that on the contracting side we also sponsor this form of contract. I should be very interested to hear the views of the World Bank on this form of contract and whether Mr Carmichael anticipates that the Bank will be making greater use of it in the future.

108. So far as payment for tendering is concerned, this is by no means new. I know of several overseas contracts in which in the past arrangements have been made for contractors to be refunded the cost of tenders, which are very high indeed.

Mr J. E. G. Palmer, Consultant, Rendel, Palmer and Tritton

The Paper is a unique contribution to the *Proceedings* of the Institution, giving to civil engineers many important and valuable details about the organization and the economic and financial criteria of this great world-wide international lending authority. The Paper concentrates specifically on port projects, and lays down that (§ 34) a port is expected to make a reasonable return on the net fixed assets. The '6% or more', regarded as reasonable when the Paper was drafted, has now been raised to 7% or 8%. This 'commercial outlook' is no doubt the right attitude for the IBRD to adopt, but it should not be forgotten that many of the highly developed countries of the West subsidize the capital costs of their major port constructions up to 75% or even 80%.

110. The Paper refers repeatedly to the 'feasibility study' and highlights the crucial importance of this document, where the economic assumptions should be tabulated, the capital costs of any number of alternative layouts and designs should be set out and explained, and (as mentioned in § 26) the effects of a number of possible variations in the basic assumptions should be measured. Consulting engineers are, of course, well acquainted with the vital need for a thorough feasibility study before

any large-scale construction works are undertaken. The Author has mentioned a figure of about \$10 000 as the average cost of a feasibility study, but he explains in § 47, where the factors used in comparing the merits of one consulting engineer with another are listed, that 'cost is not considered the most important yardstick'. This is very true and it has frequently been proved that an extra \$10 000 spent at the study stage can lead to \$100 000 or more being saved in the final capital cost of the works.

111. It is a very remarkable fact of the second half of the twentieth century that the World Bank of Washington should have been from its inception such a staunch supporter of the time-honoured practice: 'call in a real expert for your difficult problem'. The consulting engineer came into being out of the great upsurge of major capital developments in the last century, for in those days there was no other organization with the 'know-how' to turn investment dreams into revenue-earning assets. Now that engineering knowledge has become widespread it is possible, if one is prepared to carry the risk, to hire draughtsmen and try to get out one's own contract designs, but these cannot possibly compare with those obtained, for a few thousand dollars, from an existing team of experts. The designs of specialists who are well versed in overcoming the particular local difficulties that will for certain have to be faced in the many different countries of the world, are bound to be better.

112. The Author, in §§ 45-49, goes out of his way to stress the advantages of the feasibility study system and the use of consulting engineers, and gives a fair measure of praise to the British consultants. But he seems worried that we tend to be old fashioned, and too 'sensitive' about professional etiquette, and suggests that we must learn to be more aggressive in order to compete with the consultants of other countries. Yet quite a number of British firms of consulting engineers today have branch offices in several capitals overseas, and it seems to me that nearly always when you meet one of the partners from one of the larger firms he is either 'just off to Timbuctoo' or (often) 'just back from Washington'. Mr Carmichael can rest assured—probably he is well aware of this already—that a telegram to Victoria Street from anywhere in the world will produce a British consulting engineer on the doorstep a few days later! Civil engineers will be grateful to him for his clear enunciation of the sound principles of the feasibility study and for his unshakable conviction that the wise 'borrowers' employ an approved consulting engineer to further their loan projects.

Mr A. C. D. Malcolm, Crown Agents for Oversea Governments and Administrations

The Author is to be congratulated on the lucid manner in which he has set out the procedure in connexion with World Bank loans, and particularly the processes which are implemented before placing an order.

114. For a number of years I have been particularly concerned with the inspection of some of these engineering contracts once they have been awarded and I would suggest that, having given close attention to the costing of a project and the finances involved, just as much attention should also be given to obtaining the best quality product in relation to the price paid—in other words, 'value for money' from the various contractors. This is undoubtedly best done by correct and adequate inspection.

115. It is most important to insist that the governing factor in deciding whether a contract should be placed should not alone be the price quoted in the tender or even the desire to place it in a developing country thirsting for orders to employ its population, but rather the efficiency and competence of the firm tendering. Low prices and inefficient manufacture can prove very costly indeed. Especially is this necessary where a contract is placed on behalf of the government of what is itself one of the developing nations and the cash is found in whole, or in part, from a World Bank loan.

116. Moreover, where after full consideration of all these factors, it is decided to so place a contract, the greatest care should be exercised in the selection of adequate

supervision. On all contracts, be they civil or mechanical, I am of the opinion that one of the most important prerequisites of a satisfactory supply is that the material should be put to inspection at the source of actual manufacture by a competent authority.

Mr G. A. Wilson, Port of London Authority

I would like to inquire if the World Bank has developed or is contemplating the development of a new philosophy to deal with the financing of ports.

118. It is currently accepted that a port, like a commercial concern, should pay its way, and that the profit earned should pay for the replacement of assets in use at current cost and should provide a contribution towards future development. Although this concept is not novel, its enunciation in the Rochdale Report on major British ports has for a time given it great weight, but is it a sound concept or only a device intended to simplify the keeping of accounts? An examination of the facts suggests that almost all countries subsidize their ports in one way or another and a government not infrequently dictates the charging policy of its ports to influence the trade of the country in exports and in imports. This suggests that a port is a much too complicated piece of the national economy to be regarded as a straightforward commercial concern which should make a profit.

119. Apart from profitability (but related to it) is the question of the allocation of the cost of resources used by ships, inland transport and goods. The proper allocation of these would be necessary if the port is regarded as a commercial concern in order not to distort the economy, and it seems likely that this information would be useful even if the charges are subsequently adjusted to act as trade controls.

120. If the World Bank is beginning to have views on these matters they would be of great interest and importance to all port operators.

Mr F. A. O. Oseni, Federal Ministry of Works and Housing, Lagos, Nigeria

There is one aspect of Mr Carmichael's description of the organization and activities of the World Bank that I wish to comment on; this is the aspect expressed in § 33 of his excellent Paper on the processing of applications for loans from the World Bank.

122. The relevant section states that 'when the Bank is in doubt about the ability of a port authority to do its own engineering, it insists, as a condition of financing, on engineering consultants being employed.' My observation shows that in practice, this condition is imposed by the Bank in all cases where finance is sought by a developing country for an engineering project. In such cases, the engineering consultant is usually appointed from the developed countries. At least this has always been the case in Nigeria, which has sought and received loans from the World Bank for various engineering projects connected with the provision of public utilities.

123. However, it appears that all relevant facts are not always taken into consideration by officials of the World Bank, before they arrive at the conclusion that there is doubt about the competence of the local engineers who are available in the country seeking financial assistance from the Bank. In the case of Nigeria, for instance, there is already a good crop of practising engineers who have between 10 and 20 years' post-graduate experience in the administration and execution of engineering projects in many fields of public utilities (transportation systems, public buildings, water supply and power supply schemes, etc.).

124. There also can be no doubt about the quality of either the standard of their academic training or post-graduate experience, as can be assessed from the typical form their training takes. Many of them studied for their first degree in engineering at various universities overseas, mostly in the United Kingdom and the United States of America, after which they had to undergo apprenticeship training for two years before returning home. Within a few years after returning home, they have to

shoulder the responsibilities of controlling projects of greater magnitude, in both complexity and cost, than would have been the case if they had been practising in one of the developed countries. It is common to see one of these engineers working on a project from the stage of preliminary investigations and studies, through design to construction. After a few years in this sort of practice, they go abroad again to such countries as the United Kingdom, Canada, India, USSR, Australia and the USA, either for attachment to an engineering firm or for post-graduate studies, usually leading to a university Master's Degree in engineering. Thus, most of them in less than ten years have post-graduate experience, stretching across at least two continents, while some have experience across three or even four continents.

125. When it is considered that these local engineers have more knowledge of local conditions than their foreign counterparts, who incidentally only come for a stay of a few months (see § 25) to carry out feasibility and preliminary studies, the superiority of the local engineers in planning their country's projects should no longer be in doubt. Furthermore, the local engineer possesses the will and inspiration to create in his own country facilities equal to, or even surpassing those he has seen in the developed countries, as quickly as possible. This is one major factor which foreign experts appear to have nearly always neglected to take into consideration, probably due to their thinking that a recommendation to use local talents may be interpreted as an admission of the incompleteness of their expertise.

126. I should, therefore, be grateful to Mr Carmichael, if he would bring it to the attention of his colleagues at the World Bank that one does not need to be omniscient to be an expert, and that whenever they are assessing the resources of any of the countries which are just beginning to develop their potential, they should always try to make a realistic appraisal of the most important of all of the resources, namely, their trained manpower. The proportion of an external loan which is of direct benefit to a developing nation is greatly affected by the way the loan can be used to effect maximum utilization of its trained man-power at various levels.

Mr Carmichael

In answer to Mr Coode's first question, there is no real average foreign exchange component for a typical port project. If a large amount of imported equipment is required, such as cranes, forklift trucks and floating equipment, foreign exchange may amount to 100%, as many developing countries do not make any local contribution to the production of such equipment. A relatively sophisticated country such as Spain, where the Bank has some \$40 million invested in ports, can produce much of its own equipment and the foreign exchange components could amount to 25 or 35%. I have said that the general average was about 50%, and that figure may be considered representative. However, in certain countries, as for example Guinea, even the furniture must be imported and the foreign component must of necessity be very high.

128. With regard to the second question, concerning the rule-of-thumb 140 000 tons of general cargo per berth per year, this may be considered empirical. The berth I had in mind was about 550 ft long. I think the figure of 180 000 tons is somewhat high. Calcutta and Karachi ports work around the clock and achieve over 200 000 tons at some berths but often to the detriment of maintenance. Occasionally vessels must be double-banked to obtain figures of that magnitude. On the whole, 140 000 tons is considered a reasonable performance, although remaining empirical.

129. Mr Coode has raised the extremely valid question of long-term planning. Needless to say, the Bank does not expect anyone to come forth with valid cost estimates for 50 years hence. However, the Bank does consider long-term operational eventualities and, given the numerous variables in modern technology, encourages the use of sophisticated methods of forecasting trends.

130. In traffic projections we attempt to project five years ahead and the trend for the following ten years. In regard to financial information, if a realistic projection can be obtained for five years ahead it may be considered sufficient.

131. When establishing a master plan which attempts to project 25 or 50 years hence, it must always be considered a controlled experiment. It should not be costed out, but rather taken as a device based on present knowledge, to indicate what might be expected to happen at the time of implementation. An example may be derived from the case of Singapore. In that situation we proceeded, with the agreement of the Port Authority, with four general cargo berths. However, before the loan was finalized we had to change the contract to two container berths because of technical changes that occurred and the changes in the type of traffic involved. So in answer to Mr Coode's specific question, I agree with his views.

132. What is the correct design depth for water in ports? 32 ft? 35 ft? 45 ft? Anticipating such a question I prefaced each of the depths mentioned by the words 'at least'. We are familiar with the present generation of container carriers; we cannot predict what the next generation will be although it has already been discussed. Is it economic to invest in great depth when there is only a slight chance of it ever being used? Of course, each particular situation must be considered according to its requirements.

133. With regard to staff allocation, when a consultant makes a proposal we like to know who is actually dealing with the work. The firm may have been in business for 150 years and have a good name, but it is of considerable help to know that the men on the project are their top-notch people. Consultants may overextend themselves and subsequently pad out the staff with people who are not as good as the ones we would anticipate having. This is not particularly a British characteristic—the British are very good at putting on top-flight people. However, situations are found where a consultant will obtain a contract and only then attempt to find the staff; he hires people hastily to compose his team and the results are often not what one would like them to be.

134. I would hardly suggest that Mr Coode or any other members of this Institution contravene By-law 29. What is at the back of my mind is that frequently the British as a group, contractors and consultants and government agencies, have the financial means to deal with projects but do not make a concerted effort. In other countries, such as Holland, an inquiry may be made to a consultant and he will say, 'I cannot do it but my countrymen will be able to do it for you. Do not go abroad we can handle the business'. I seldom have seen any of that sort of willingness to help each other from British Government representatives abroad or from British consultants and contractors. Personally, I think it would be to the advantage of the British to be aware of the sources of funds, including Britain, which does a fair amount of foreign aid, so that British consultants and contractors know what their government, and others, are doing.

135. In answer to the question regarding the Bank's ensuring fair treatment to all concerned, we attempt to provide impartial treatment to all parties. It is evident that in order to do so we must listen to all sides in any argument.

136. How does the World Bank see that engineers are suitably rewarded for their services? It must be borne in mind that the Bank has considerable influence and leverage in terms of future business. In the case of people wishing to borrow money, this is a very great threat, and in the final analysis the strongest possible.

137. Some members will know of the Bank's past efforts where a particular authority did not suitably terminate a consultant's services. Subsequently, through a different international agency, they were trying to obtain some assistance and the application came through the Bank; we stated that the particular company or authority had not suitably discharged the consultant who had worked for them and therefore the second agency did not grant them the money.

138. In answer to Mr Gritton's first question I should like to clarify the figure of \$5667 million: this is the amount of money the Bank has lent; it bears no relationship to the Bank's capital. The subscribed capital is composed of paid-in capital,

\$2294 million, plus the uncalled capital of \$20.6 billion totalling approximately \$22.9 billion.* It should also be borne in mind that most Bank loans are made from money we have borrowed on the open market and, although we might make more loans by lowering our requirements, we would also lower the quality of our portfolio and make subsequent borrowing to replenish Bank funds only possible at higher rates of interest.

139. We give considerable consideration to regional transportation networks when dealing with any given transportation project, port or otherwise. Regional transport studies have often indicated the need for port projects and we will continue to be reluctant to finance a port without knowing its position within the total transportation network.

140. The figure of 6% may be considered a test as to whether resources are being well used. Its value is as a measure of the opportunity cost of funds. There is no doubt that a major port improvement can have significant repercussions throughout the economy. However, tracing these and the multiplier impact of the investment takes one into assessment of the effects of the total income of the country. To my knowledge, this type of income impact study has been performed in very few instances for transportation and transportation-linked projects and not at all for a port project. Mr Gritton is quite right in drawing attention to the overall effect of seaports and airports on the economy of a country. In the latter case we would hope that methodological advances may emerge from the work relating to the third London Airport.

141. I agree with Mr Gritton that, with satisfactory site investigations, realistic provisions for engineering contingencies should be no problem. Rising costs of labour and materials and fluctuations in the value of local currency are frequently difficult to estimate. Should there be delays such as he described, the project should be considered at the latest possible moment to reflect the latest forecasts and its viability recalculated.

142. Normally the Bank prefers to make a definite loan for a project and let it stand in its own right. Some governments have very little foreign exchange, and if they do not have enough money to carry out the project it will stop. It is therefore essential that a certain flexibility be maintained.

143. When appraising a project, even if our work is based on a report several years old, we remain aware of current costs and prices and revise the estimate accordingly. We also make provisions for various contingencies.

144. The establishment of a revolving fund has been discussed in the Bank so that consultants who take the risk of preparing a proposal which is unsuccessful may be compensated. Recently, we attempted to establish the cost to a consultant of preparing a proposal. We obtained a figure of approximately \$10 000 including a visit to the site. It has been argued in the Bank that such an expense should rightly be reimbursed to consultants but we have not yet come up with any final idea on it.

145. Also, we may have been hiring consultants in the wrong way. We tried to visualize what the terms of reference should be, but we have since decided to guide rather than direct the consultant. Perhaps after a consultant has been selected his team should then go to the field and return to the Bank after two or three months with a survey of the situation in a particular location. This would provide an opportunity to size up the situation, to analyse the lack of statistical data available (which is very frequent) and to come up with a better proposition than would otherwise have been possible. I hope that some facet of this will be reflected in our future activities.

146. I agree with Professor McDowell that the engineer's outlook should be broadened. The Americans and the Europeans, I think, do a little better than the British universities. Usually their curriculum is more general, much broader based and I frequently meet engineers from France who are also economists. Such birds are relatively rare in Britain. Diversification seems to be the watchword at this time.

* In these answers the American billion is used, i.e. one billion equals one thousand million.

I welcome Professor McDowell's statement that if the profession indicates that well-qualified, broadly-based engineers will be suitably rewarded, the universities will produce useful courses to this end. The Bank, in order to attract well-qualified young people has been employing a Young Professional system for the past three years. Young people of high academic standing are invited to join the Bank. Selected candidates are brought to Washington and shown, over a period of two years, how the Bank operates. They are given six months' training in four of the Bank's operating departments during which time they go on missions and participate in the everyday work of the Bank. After this period they are made an offer of permanent employment and are given every chance of advancement in the department of their choice.

147. As I stated earlier, there appears to be a communications, and therefore co-operation gap within the British consulting profession. Mr Gibb is entirely correct in assuming that the consultant is not taken for granted at the Bank. He forms the mainstay of our *modus operandi*. Most developing countries do not know how to proceed with a project and require professional help. We try to encourage them to take an active part but not to the detriment of consultants. Many years will elapse before consultants can be dispensed with.

148. Mr Gibb seems to appreciate the point of 'going after business' that I have tried to make clear, when he indicates that 'we must to some extent take on our foreign competitors with their own weapons'.

149. I appreciate Mr Ordman's work in planning the Port of London, which is a most essential part of capital investment. Britain particularly cannot afford to make what the Indians call an 'infructuous' investment, but must certainly husband her resources at this time and put the money where it will do the most good. I agree with him absolutely that the planning process should be a continuing progressive system; it cannot be done in fits and starts.

150. The collection of statistics is frequently bad all over the world. There has been talk in international circles of having a sort of basic statistics collection for developing countries. This would help many planners and might help people in port planning to come up with the right answers.

151. The United Nations Development Program (UNDP) is probably the most active agency in the field of encouragement and aid referred to by Mr Ordman. UNDP-financed studies invariably provide grants for fellowships under which nationals of the recipient country are sent abroad for training. The Bank also frequently provides funds for management, operational and accounting consultants to train borrowers' staff in improved and modern methods.

152. Mr Mettam asked if I could confirm that the UK is the only country with national control over port planning limited to financial profit to the port itself. I hope the answer is yes! Port planning on a national scale exists in Israel, Tunisia and Singapore. In America it is more or less a free-for-all. Each port wants to grab all the business it can see and foresee and there is no central planning organization. But as Mr Mettam well knows the profitability of a port should never be the only criterion for its development; economic and national planning factors must also be considered.

153. Why should not the World Bank make a loan to a UK port? Well, we have never been asked but we are normally the lender of last resort and if the money can be raised locally through the ordinary loan process we would keep away from it and let the British help themselves. The appraisal of a British port project would be a 'valuable exercise' indeed!

154. In answer to Mr Carpenter, as I have said, the reasonableness of the return is generally determined by the financial needs of the port. However, the financial needs include a material contribution to capital investments. The financial needs are met partly by cash generated by the port and partly by borrowing, with the former largely composed of the profits (the returns) and depreciation. The Bank's view is that a public port should accumulate reserves to finance a reasonable part of future investments. In practice this would mean that it would be expected to cover at least

the local currency costs of such an investment. This has no bearing on amortization of existing debt which must also be covered by cash resources. The replacement of fixed assets must be covered by the depreciation reserve.

155. I agree with Mr Hill that we must keep our ideas flexible on hoverport developments and the applications of new technical advances in the field of transportation. We have financed two hovercraft so far and I think there will be more of this type of vessel, especially as technical advances make them cheaper to operate and their capacity increases.

156. Mr Beckett's question is far-ranging and has wide implications. In essence, the criteria for any project must be a sound project appraisal, good methodology and a reluctance to accept political rationale for a project appraisal.

157. With regard to his reference to 50 consultants being invited for proposals, we would definitely be against it. When the Bank has to select a consultant no more than four or five firms are asked for proposals and we encourage our borrowers to do likewise. I sympathize with Mr Beckett's statement that consultants often secure assignments in a very competitive field and consequently have an 'investment in the project'. It would appear that when this is the case the consultant can no longer give the impartial advice expected of him and his pocket rather than his brain will begin prejudicing the issues.

158. Why should consultants only get about 6% for fees when we can charge 6% interest over the life of a loan? Let us compare like with like. The consultant is not working all the time as our capital is and the fee for services need have no relation to the cost of financing a project. If we could make loans cheaper we would be quite happy to do so.

159. Mr Dalman has asked about the ratio of contributions and how it is fixed. It is based on the economic strength of the country as determined by the IMF. Capital subscriptions to the Bank are related to this IMF determination. The British contribution is presently greater than that of Germany or France. The proportion of work assigned to consultants or contractors of a country bears no relation to that country's contribution to the Bank. We do not keep a breakdown of figures but I believe that the United Kingdom gets at least its fair share of the business.

160. Are there sufficient engineers in the Bank? I think not and am trying to recruit more. How do their numbers compare with those of financial analysts and economists? We are being squeezed out. I consider greater engineer representation would be an improvement, especially if they had the skills referred to by Professor McDowell.

161. Has the Bank ever helped to determine the number of shifts? Yes, we have. In the case of Singapore, where the single shift was increased to a modified two-shift system plus overtime, and also elsewhere the night shift was introduced and worked better than the day shift as there were few distractions available during the night. The management and operations consultants that we finance frequently recommend changes in the current methods of working.

162. With regard to the amount of time spent by senior partners, we do not expect them to give 100% of their time to a Bank project. We could not afford it! Of course a small contribution is acceptable. But we do try to get the top people on the job. We like to have the best brains available for as long a time as necessary. It is up to the consultants to figure this time out for themselves. The availability of a 'brains trust' of senior partners and engineers to guide the project team appears to have much merit. Lack of local knowledge must always be a disadvantage.

163. In answer to Mr Holloway, the Bank is strongly concerned that contractors be treated equitably. We have actually said, 'it has become known in the contracting world that you did not give the ABC Company a fair deal. Consequently, when you go to the contractors in future you will find them charging a higher price than if you had dealt with them fairly and equitably.'

164. With regard to FIDIC, the Bank does not underwrite or sponsor any particular form or any particular standards of specification. Global conformity to international conditions and standards would certainly be desirable. Nevertheless, there have been cases of a particular country practically rewriting the FIDIC form and claiming it as their own; however, it was so modified in their favour, that the benefit of having a reasonably equitable document, such as the FIDIC form, was completely lost. We would certainly like to see greater use of such a type of form.

165. With regard to refunding the tendering costs, I am not aware of any World Bank financed project where the unsuccessful bidders were refunded such costs. I sympathize with those who spend much time, effort and money and then do not win the award but the difficulties of assessing the cost of preparing a tender are considerable.

166. I thank Mr Palmer for his most interesting remarks but must point out that the average figure of \$10 000 mentioned in my reply to Mr Gritton refers to the cost of preparing the proposal. The average cost of a feasibility study may be about \$200 000. I concur with Mr Palmer that additional money spent on study frequently proves an excellent investment.

167. In answer to Mr Wilson's questions, as far as I know, the Bank has not developed and is not contemplating the development of a new philosophy to deal with the financing of ports. That ports should pay their way is a sound concept which enjoyed considerable prominence long before the Rochdale Report, but I must agree that there are many cases where they do not. Without such a concept, distorted rates, subsidies and loss of autonomy result. There is no real reason why 'a complicated piece of the national economy' such as a major port should not be regarded as a straightforward commercial concern.

168. In recent port project appraisals we have been taking a closer look at the total intermodal picture as suggested by Mr Wilson. This is the only true measure of the allocation of resources required to move goods from their origin to destination. It is laborious and time-consuming, but as data become more readily available the task will be lightened and our way made clearer to a more perfect decision-making process.

169. In answer to Mr Oseni's question, I should like to stress that it has always been Bank policy to encourage self-reliance and autonomy in member countries. When we consider a project we also consider the technical staff available to the borrower for undertaking the economic and financial analysis required, executing the project, and operating it. Loans have been made for projects where no consultants were employed.

170. In most developing countries there are excellent engineers but they are usually very few in number. Should the available technologists be taken off some other high priority work to concentrate their talents on one specific project or should they continue to disseminate their knowledge in a broader scope of action and utilize their talents for operational planning? Often, the benefits of using outside consultants may include supplementing local manpower and giving younger, less experienced engineers the possibility of working as counterparts and observing at first hand some problem-solving processes which it might otherwise take them years to know. One might consider this as an inexpensive training scheme.

171. Bringing in outsiders has often been fruitful for borrowing countries as they can take advantage of experience acquired by that firm in an entirely different country but one to which the borrowing country might not have access.

172. Consultants may be used for pre-feasibility or feasibility studies, design, review, or simply project supervision—any or all of these. Sometimes, although engineering skills are available, economic skills and techniques are not. Often, mutually beneficial relationships have been achieved by local firms in association with a foreign firm. In fact, several countries have legislation, which we do not

encourage, requiring that foreign firms associate with local enterprises in forming a joint venture to undertake consultants' services.

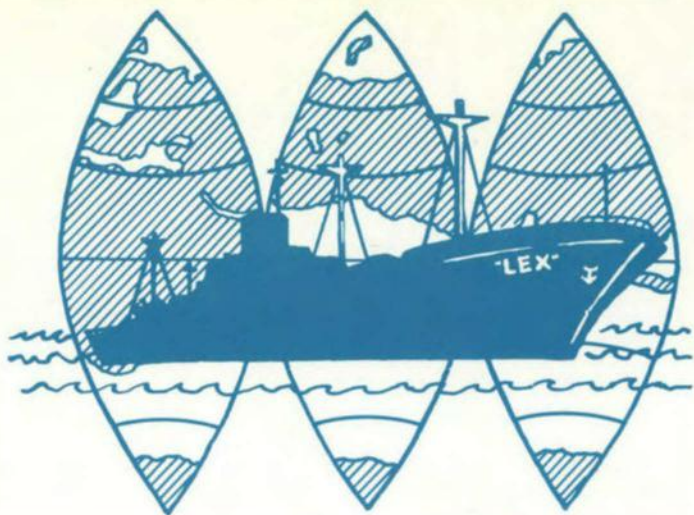
173. Review and feedback with local authorities always exists. Sometimes, local authorities, although fully aware of the competence of local talents nonetheless prefer to bring in outsiders because of the range of the experience and the fresh approach they may bring to the project.

Corrigendum

§ 5, line 8, of Paper for '3-4%' read '3/4%'.

The Institution as a body is not responsible for the statements made or for the opinions expressed in the foregoing pages.

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Shorter Articles and Comment:

*The World Bank and Port Development**

ARTHUR J. CARMICHAEL, B.Sc., M.I.C.E.**

INTRODUCTION

The World Bank Group consists of the International Bank for Reconstruction and Development (World Bank), the International Development Association (IDA), and the International Finance Corporation (IFC). This group is one of the specialized agencies of the United Nations. It is an important and independent member of the growing community of governmental and private organizations engaged in international aid and lending.

The World Bank, the senior institution of the group, opened for business in 1946, having been established at the Bretton Woods Conference of 44 nations in 1944. After making initial loans to assist in the postwar, pre-Marshall-Plan reconstruction of Europe, the Bank has tended to concentrate on lending for high-priority projects in the developing world. Loans are usually direct to governments or organizations such as port authorities or railways, with a government guarantee. A typical port loan may have a life of 25 years, including a grace period of five years, and interest of 7%: this is termed a 'hard' loan.

The IFC came into being in 1956. It furthers economic development by providing equity and loan capital for private enterprises, in association with private investors, without government guarantee. Since, from the nature of their organizations, most port authorities are unlikely to require the services of the IFC no further description is given here.

The IDA was formed in 1960 to meet the needs of those countries for which external capital is essential to their development but which cannot be serviced on conventional terms. IDA finances the same type

* Updated and revised text of a paper read before the Institution of Civil Engineers, London, April 1969.

** Chief, Port Division, Transportation Department, International Bank for Reconstruction and Development (World Bank).

of project, after the same evaluation process, as the Bank. The financing terms, however, place a much lighter burden on the country's balance of payments. A typical IDA credit extends over 50 years, without interest, and with amortization as follows: first, a grace period of 10 years, then 1% per year for the next 10 years, then 3% per year for 30 years. The borrower pays a service charge of 3/4% per year on the principal amount of the credit withdrawn. Such terms are rightly called 'soft'.

BANK AND IDA: MEMBERSHIP, FINANCIAL STRUCTURE AND ORGANIZATION

By July 1970 Bank membership rose to 114 out of a total UN membership of 125 countries: that of IDA to 105 countries. The Bank is truly a World Bank²—its member-share-holder governments are spread throughout the non-communist world, and it finances projects and mobilizes funds on all continents.

The Bank is in effect a corporation in which its members hold voting rights in proportion to the size of their contributions; for example, among the industrialized nations: USA (24.8%), UK (10.25%), Germany (5.09%), France (4.20%), and among the non-industrialized small nations: Botswana (0.11%), The Gambia (0.12%), Lebanon (0.13%), and Cyprus (0.16%). Voting power of IDA members is approximately similar. The organizational structure for policy formulations and executive supervision is essentially the same in both institutions.

Both the Bank and IDA have their own assets: each is financially distinct. The Bank has three primary sources of funds: the paid-in capital of member governments, borrowings, and net income. IDA's resources come principally from budgetary allocations of the 16 richest member governments¹; in addition, the Bank has made transfers from its profits to IDA.

The capitalization of the Bank was changed in 1959 so that, in practice, 1% of each member's total subscription is payable in gold or US dollars and 9% payable in the subscribing country's currency to be lent only with its consent. By June 30, 1970, subscribed capital had risen to over \$23,000 million—reinforcing the security offered to investors and enhancing the Bank's borrowing power.

Ultimate power in the Bank is vested in a Board of Governors, consisting usually of the Minister of Finance or Governor of the Central

¹Switzerland, which is not a member of the Bank or the UN, has, however, made a loan of Swiss Francs 50 million to IDA.

Bank of each member country. In practice, most of the authority of the Board of Governors is delegated to the Board of Executive Directors. The President of the Bank serves as Chairman of the Executive Directors. All proposals for loans, credits, major technical assistance operations and other matters involving policy issues are submitted to the Executive Directors for their consideration and decision. Such proposals are first reviewed by a Loan Committee, consisting of senior Bank staff, which makes recommendations to the President who, in turn, submits them to the Board.

The Bank currently has a staff of over 2,000 (about 50% being professionals) from 81 countries, who are employed in some 20 departments.

Of these, the Projects Departments require particular mention in the present context. The primary task of these departments is to identify, help prepare and appraise projects, and supervise their construction and operation. They also supervise sector and feasibility studies financed by the Bank as part of its Technical Assistance Program or when acting as Executing Agency for the United Nations Development Programme (UNDP). They approve consultants selected by borrowers and help to prepare their terms of reference. In conjunction with the Administration Department, they select consultants who are directly engaged by the Bank. They make recommendations on the amounts and terms of loans and on contractual arrangements, and they ensure that the procurement of goods and services under the projects which the Bank finances is in accordance with its guidelines established for this purpose. In short, the Projects Departments see that a project is technically sound and financially and economically satisfactory. They are, in effect, the technical arm of the management of the Bank.

LOANS AND CREDITS MADE

To give some measure of the Bank's operations and the work processed in the Projects Departments, the cumulative total of the Bank loans and IDA credits made to March 31, 1970, is given in Appendix 1. Transportation tops the list, with the largest total. Of 669 Bank loans and 189 IDA credits, totalling \$15,659 million, some 267 were for transportation projects, totaling \$4,801 million. Bank loans and IDA credits usually provide the foreign exchange component of projects financed, and amount on average to less than 50% of the total costs of projects. The aggregate investment undertaken to date is therefore in excess of \$31,000 million.

PROJECTS DEPARTMENTS

Every project financed by the Bank or IDA is subjected to searching scrutiny. Investigations are made of the economic, technical, managerial, organizational, commercial and financial aspects of the project before a loan or credit is negotiated. During the construction and procurement stage of a project supervisory visits are made and, after completion, the Bank continues to be interested in the borrower's progress. Most of these activities are carried out by the Projects Department.

The Projects Departments are comprised of eight departments: Agriculture, Education, Industrial Projects, Population, Public Utilities, Special Projects, Tourism and Transportation. The Transportation Department deals with airlines, airports, canals, highways, pipelines, ports, railways, fishing harbors, sea defenses, shipping and waterways, and loans for most of these categories have been made.

Transportation Department: Port Division

The Port Division's responsibility is for canals, ports, shipping and waterways. In the categories of ports and waterways, a total of 42 loans or credits, aggregating \$520 million, has been made (see Appendix 2).

To illustrate the activities of the Port Division and give some indication of the procedures and criteria involved in evaluating projects, the progress of an imaginary, normal-to-optimistic example of a port project is given.

A Bank economic mission has recently visited and reported favorably on the member country. Its government is stable and its planning organization has evolved, from sector surveys and careful project selection, a realistic national development plan embodying well-conceived ideas as to how best to apply the country's limited resources to give the maximum possible sustained development. The development plan incorporates the result of feasibility studies on which consultants have been employed. In this plan, the transport sector is often the largest (15-25%) in the total public investment, of which port development may form a relatively small but crucial part.

The relevant Area Department has indicated to the Government the Bank's willingness to consider the port project for financing, and has passed on any relevant papers to the Transportation Projects Department for consideration and possible appraisal. The data submitted to the Bank are reasonably complete and an appraisal mission is scheduled.

Sometimes a questionnaire is sent to the appropriate ministry and/or the port authority asking for additional information. Information required includes:

- (a) the legal status and constitution of the port;
- (b) the location of the port in relation to the transportation network of the country and other ports;
- (c) a physical description, giving number of berths, cargo-handling equipment, ship-loading/unloading installations, floating craft, etc.;
- (d) past traffic statistics, showing the number and types of vessels and the annual tonnage of cargo for each of the last five years, separating bulk from break-bulk and liquid and dry cargoes, and indicating main commodity groups;
- (e) future traffic projections, annually for the next five years broken down by commodities, and for about 10 years thereafter on a more general trend basis;
- (f) operational information, such as berthing procedures, ship turnaround time, productivity of port labor, etc.;
- (g) port dues and charges, including storage, stevedoring, lighterage, equipment hire, etc.;
- (h) financial information, balance sheets, income and expense statements for the past five years, projections for the next five years, and the trend thereafter for five additional years;
- (i) an estimate of the project cost, broken down to give local currency and foreign exchange requirements and the basis of the estimate; and
- (j) economic information, statement of main benefits to be derived from the works and equipment.

The above information is expected to be prepared prior to the departure of an appraisal mission. This wish is not always realized, however. The mission normally consists of an engineer, a financial analyst, and a transport economist. The appraisal mission takes about three to four weeks in the field and some four to six weeks for discussion and report writing in the Bank. Should the commodity forecast need additional study, this may involve the Bank's Economics Department carrying out a detailed investigation of the world market prospects of that particular commodity.

On the economic side of the appraisal, increasing use is being made of sensitivity analysis to determine the effect on the rate of return of variations in certain components of the project's cost, fluctuations in traffic growth, and differences in the estimates of unit benefits. Also, should the Bank staff not be sufficiently expert on a particular aspect of the project, a consultant may be engaged to advise on, for instance, the amount of ore reserves of a mine supplying the minerals for export,

berthing requirements of hovercraft, the hydraulic characteristics of a half-constructed breakwater, or the effectiveness of a radio-location fixing system. Such additional investigations, of course, take time, but if they are not required, a first draft appraisal report can reasonably be expected some 8-10 weeks after the mission's arrival in the field. A further month or so may be required before the draft is cleared through the Division and Department, and a modified report is sent for consideration of the Departments involved. Modifications are usually limited to legal and financial matters so that, within a further two to three weeks, the report can be submitted to the Loan Committee for consideration.

If approved by the Loan Committee, representatives of the member government and the port authority are invited for negotiations. These arrangements may take a further two weeks, so that some four to five months may elapse, in the case of a smooth operation, from the arrival of the appraisal mission in the field to the arrival of the borrower's negotiating team in Washington. A typical team may consist of a representative of the Ministry of Finance and/or of Transport, a government lawyer and the Chairman and Chief Engineer of the port authority, but the actual composition may vary with the problems likely to be encountered during negotiations. These might range from changes in the administration, tariff revisions, accounting improvements on the one hand, to modifications in the scope of the project on the other.

On completion of successful negotiations, the report is again modified accordingly and is presented to the Executive Directors for their consideration and decision. Upon approval by the Executive Directors, the port authority as borrower and the Government as guarantor are invited to sign the loan documents and complete the necessary requirements to make the loan effective. Copies of the documents are then registered with the UN as is required for all "international agreements".²

PORT PROJECTS: SOME CONSIDERATIONS

The Bank takes considerable care, and so far has been remarkably successful, in ensuring that the projects it finances will be financially viable and yield a good economic return. It is not only interested in the prospects of loan repayment but also in financing projects that will contribute to the development of its member countries.

² See art. 102 of the United Nations Charter.

Each port project is considered on its merit and in its own particular context, but the following general considerations are likely to be in the minds of the members of a Bank appraisal team.

Port Organization and Management

The Bank does not consider any particular type of organization as the 'be all and end all' of port administration and operations. However, over the years its experience has been that a full or quasi-autonomous type of port authority, with representatives of port users on the board, subject to government budgetary, planning and policy control but with the maximum degree of freedom in day-to-day operations, gives the best results. The Bank has assisted in the setting up of the Port Authority of Thailand, the Callao Port Authority, the Israel Ports Authority, the East Pakistan Inland Water Transport Authority, the Liberian National Port Authority, and the Tunisian National Port Authority, among others.

A good manager can make something out of a poor organization but bad management will soon be reflected in an impaired port operation. The Bank has found, for example, that customs departments, from the nature of their main function (assessing and collecting duties), are not suitable vehicles for operating a port. However, port authorities should clearly cooperate actively with customs authorities both to facilitate the latter's task and to evolve methods of cargo clearance suitable for the container age. The Bank worked with the Government of Iran in transferring the function of cargo-handling and storage from the authority of the customs to the port and navigation organization specially set up for this purpose.

When the Bank is in doubt about the ability of a port authority to do its own engineering, it insists, as a condition of financing, on engineering consultants being employed. Consultants are also frequently employed to improve management, operational and accounting procedures.

Port Finances

The Bank considers ports as revenue-earning entities and expects them to make a reasonable return on the net fixed assets employed. A reasonable return may be 7% or more, after deductions for depreciation and before service of debt. Port charges should pay the cost of services provided so as to discourage an inefficient allocation of national re-

sources which, in turn, would prevent a maximization of national benefits. The reasonableness of the return is generally determined by the financial needs of the port. These include adequate working capital, contributions to reserves, interest on and amortization of debt, and a material contribution to capital investments. Port authorities should concentrate on the business of port planning, constructing, maintaining and operating, and should not become too heavily engaged in finances and real estate not connected with the port.

Economic Considerations

In all Bank appraisals considerable attention is given to the economic aspects. The estimated future economic benefits are calculated. These may include the economies of using larger ships, more efficient cargo-handling (including the containerization of general cargo), a reduction of labor force, increased productivity of labor, reduction in ship waiting and turnaround time, elimination of lighterage, reduced damage to cargo, reduced insurance premiums, elimination of surcharges placed on a congested port, reduced pilferage, faster movement of goods through the port with a resulting reduction of capital tied up in goods in the transportation 'pipeline', etc. This is not to suggest that the benefits listed are additive or available in all cases. The calculated benefits are summed and compared with the estimated cost of the project and a discounted rate of return is obtained. This may be used as a basis for comparison with alternative investments, perhaps outside the transport sector. A sensitivity analysis is frequently applied to assess the effect of different values or variables on the end result.

Port Operations

The operations of no two ports are alike. It is difficult, therefore, to lay down general yardsticks for productivity. However, in the developing world, a good rate of handling break-bulk general cargo is 140-150,000 ton/year per berth. This should only be considered as a rough rule of thumb, as it depends on variables; for example, the workability of ships' hatches, the number of shifts operated per day, the availability of appropriate mechanical-handling equipment, the congestion or otherwise of transit sheds and storage areas, seasonal peaks of vessels and cargo, tallying of cargo, bonuses to labor, the rate of customs clearance, etc. Nevertheless, it is a reasonable target for port authorities in the developing world.

Port Engineering

The need for accurate cost estimates based on sound technical studies, including borings, hydraulic and meteorological observations where required, and up-to-date rates for labor and materials is self-evident. It is worth emphasizing, however, that since a loan or credit is limited to a fixed amount and the borrower has an obligation to finish the project, the government is entering into an open-ended commitment. For this reason, among others, a realistic provision should be made for engineering contingencies and variations in the cost of labor and materials, even though consultants or port engineers are sometimes hesitant to do so. Again, while it may be thought trite to say that port layouts should suit the present and forecast traffic flow and be as flexible as possible to cater for unforeseen variations in volume and changes in the pattern of the traffic and in its mode of handling, much more emphasis needs to be given to the technological revolution taking place in all modes of transport which affects ports either directly, or indirectly by competition.

The Bank has completed studies to determine the optimum number of berths of a port and the optimum depth of water that should be provided. Unless a positive case can be made for something smaller, a length of 600 ft and a depth of at least 32 ft at mean low water would seem appropriate for present day, break-bulk general cargo berths. For containerized general cargo berths the possibility of 'in line' construction, combining say, three standard 600 ft berths to accommodate two larger container vessels, should be borne in mind and such berths should be designed so that future deepening to at least 35 ft is possible. For modern bulk, dry-cargo vessels depths of at least 45 ft are expected. While the limits for bulk oil tankers seem to be only that of designers' visions, the monsters now afloat or scheduled for service can normally be expected to load or unload in deep water at the end of a long causeway or submarine pipeline.

The formulation of port projects has been made more complicated in recent years by the magnitude and rapidity of technological changes. General cargo can no longer be considered as a mixture of various shapes and sizes that will be loaded or unloaded over the side of a ship. Today it is likely as not to be unitized, on pallets or in containers shipped by vessels employing side or end loading, roll-on roll-off techniques or wells for holding containers. Bulk cargoes are now moving in ships of sizes not considered practical a few years ago and requiring structures or anchorage facilities in depths of water never

previously considered a practical possibility. LASH vessels, hovercraft, hydrofoils all add new concepts to the handling of cargo and passengers and new dimensions to the complications of port layout, design and capacity.

In the light of the above major trends, the Bank advocates a policy of flexibility and advises borrowers to provide layouts that can be readily adapted to new methods of cargo-handling as the pattern of trade changes. Structures should be so designed as to support future loads and provide depth of water alongside for future generations of vessels.

Vessel Financing

Bank lending for merchant or commercial shipping has been both direct and indirect. Direct lending for shipping most frequently arises where tugs, fishing vessels, dredgers and other vessels have been included in port projects. Indirect lending has arisen through the activities of Development Finance Companies (DFC).³ Recently, the Bank has given specific approval to DFC proposals to lend for the purchase of two bulk carriers in the Philippines and one ore carrier in India. In general, it can be said that the Bank is prepared to consider applications for financing all types of commercial shipping under both direct and indirect lending procedures.

Some shipping activities can proceed independently of the internal port system of a country, for example most of the merchant shipping activities of Norway, Greece and Japan. Other shipping activities exist as an adjunct of or as part of a country's internal transportation system. In this case shipping activities may be arranged and organized so as to achieve a least-cost solution to the problem of distributing goods within the economy.

The establishment of a national merchant marine can have important advantages both for countries with large import or export trades and

³The Development Finance Companies Department provides information and advice to the Bank Group generally on all matters concerning development finance companies. More specifically, it makes recommendations to the appropriate Bank Area Department or Corporation Investment Department on the suitability, amount and conditions of proposed Bank loans to or Corporation investments in development finance companies, and participates in negotiations for these loans or investments. The Department keeps in close touch with all development finance companies assisted by the Bank Group, so it may identify these companies' problems as they arise, help them with their senior management personnel requirements and with programs designed to improve their performance. It also reviews appraisals and approves, as necessary, projects submitted by development finance companies for financing under loans received from the Bank Group.

for countries without such trade. The United Kingdom and Japan are examples of the former, Norway and Greece of the latter. Whether or not a developing country or group of countries would be wise to expand or develop a national merchant marine cannot be determined without careful study. The effect of a national merchant marine must be considered in conjunction with indirect external costs and benefits which may accrue to the national economy and with the two particular advantages which shipping has—the transferability of assets and the short period required to produce the assets.

DEVELOPMENT PLANS AND SECTOR STUDIES

An important consideration borne in mind during the Bank's rigorous examination of a project is how the project fits into the overall development goals of the member country. Many countries have development plans which reflect their aspirations and intentions, and these are frequently broken down into medium-term plans for a period such as five years. One advantage is that a more manageable, comprehensive package then results, which can be financed by annual appropriations from the national budget. Unfortunately the data on which development plans are based are often insufficient, incorrect or even non-existent; the technical investigation may be inadequate and the cost estimates unrealistic, and inhospitable political and administrative environments sometimes make long-range planning impossible, and even short-term execution doubtful. The difficulties and perplexities which planners, macro and micro alike, have to face are many, e.g. the failure of the East African groundnuts scheme, the topping of cofferdams during the construction of the Kariba Dam, the 1966-67 droughts in India, the current Indo-Chinese political situation, the Arab-Israeli conflicts and consequent closing of the Suez Canal, the separation of Singapore from Malaysia, the recent difficulties in Nigeria, to mention but a few.

A good overall development plan will identify suitable major sector developments. However, it is often the case that further study of the transport sector is required before a particular port project can be prepared with assurance and proceeded with in reasonable certainty. While a cynic has remarked that 'the road to inertia is paved with studies', the Bank has found well-prepared sector studies in transportation to be of great importance in determining economic justification and orders of priority and spends considerable effort to produce such studies.

Although the Bank has no set rules for carrying out sector studies or any particular format for their presentation, a comprehensive examination is expected to determine whether or not the project is viable and of high priority.^{4,5} Remarkably, this is the recommendation in many studies. In some cases the Bank may provide assistance in the preparation of suitable terms of reference for the studies, in locating financing from international agencies, in selecting consultants and in supervising the studies. In a few cases the Bank has financed port studies from its own resources, e.g. in East Pakistan, Iran and Somalia.

A typical feasibility study leading to a port project is likely to be regional in nature if the country is large, or national in nature if the country is small. International planning is desirable (especially for container ship facilities) but is often not practicable. Preferably the study is done by an independent agency (National Ports Council, Ministry of Transport, Plan Organization, etc.) or its consultants, removed from the individual ports involved, but of necessity working with them in the planning process. The study should not be deferred until an emergency arises and it becomes obvious that something must be done. One of the most difficult problems that the study team has to solve is that of estimating the volume and composition of the future traffic of the project port, based on commodity movements in its service area. The team's task is often made more difficult by the lack of reliable statistics in the field but is often facilitated in the office, at the report writing stage, by the employment of modern analytical techniques and probability analyses.

The feasibility study should always clearly state the assumptions made—after all, we are planning in an environment of uncertainty—and should adequately describe the alternative solutions that have been rejected. The recommended solution should be the one that gives the lowest total of distribution and transport costs. Any worthwhile solution will depend on many factors, including the relationship of the project port to the country's transportation system, the ability of any existing ports to handle the traffic or to be modified to do so, the suitability of the proposed site for low-cost construction and future expansion, the advisability of building to full capacity now and benefiting from the economies of scale or of adopting construction by

⁴ King, J. A. *Economic Development Projects and Their Appraisal*. John Hopkins Press, Baltimore, 1967.

⁵ Adler, H. A. *Sector and Project Planning in Transportation*. John Hopkins Press, Baltimore, 1967.

stages, the possibility of technological changes in cargo-handling and changes in the pattern of trade (e.g. containerization of general cargo, fewer vessels of increased draft and cargo-carrying capacity), the interest rate used to discount the estimated capital and future maintenance costs and the quantifiable benefits to a present value, the operating costs of the new facilities (e.g. an alongside operation compared to lighterage, mechanically intensive versus labor intensive), and so on. A well-balanced presentation, evidencing common sense and good judgment, combining the theoretical with the practical approach, should be the objective.

ROLE OF THE CONSULTANT IN BANK PROJECTS

How is a firm of consultants retained by the Bank or by a Bank member country for a port study or port project? In the case of direct employment by a member country (or one of its port managing entities) it is simple; the consultant goes after the business. While the idea of selling may be anathema to some traditionalists, the world has become competitive. In such cases, the Bank is not directly involved in the selection of the consultant but has the right of approval of the borrower's choice, and only approves if it considers the consultant selected as likely to perform satisfactorily.

Where the Bank acts as executing agency for the UNDP or pays for the work from its own technical assistance funds, the consultant is selected by the Bank in agreement with the member country. From its comprehensive files⁶ the Bank selects some four or five firms from different member countries known to have experience, skill and proficiency in the type of project being considered, and invites proposals from them. The proposals are carefully and impartially evaluated.

The best-qualified firm, chosen tentatively, is asked to submit its financial proposal and is then invited for discussions. If the overall proposal is satisfactory after these discussions, and the costs are reasonable in relation to the services to be provided, a contract is signed with the Bank after clearance by the member country which is represented at the discussions. There are often advantages in asking the same firm that carried out the feasibility study, which includes preliminary engineering, to prepare the detailed designs, contract documents, etc., for the final engineering, and also to supervise the execution of the

⁶Details of about 1,800 firms of consultants are presently on record.

project. The aggregate amount of contracts awarded to engineering consultants in connection with projects financed by the Bank and IDA ranges between \$50 and \$100 million/year. The Bank is interested in seeing that high standards of professional competence are maintained, that member countries get good value for their money and that consultants are fairly treated and suitably rewarded for their services. Consultants must be prepared to give a client unwelcome advice—to recommend rejection of a non-meritorious project, even when such advice means the end of the consultant's contract.

CONCLUSION

Transportation, whether by rail, road or water forms the modern sinews of any nation's economy. As an international cooperative organization, the Bank Group is frequently in a unique position to act as a catalyst in helping member countries. The hopes, aspirations and intentions of millions in the less-developed nations of the world highlight the magnitude and urgency of the development task. The World Bank Group can, with plain common sense leavened by some idealism, also play a useful and important part in this great endeavor—"God made the sea, we make the ship; He made the wind, we make a sail; He made the calm, we make oars". (Swahili Proverb)

APPENDIX 1

*World Bank Loans and IDA Credits
by Purpose and Area*
(cumulative total at 31 March, 1970)
(\$ million net)

	Total	Western Hemisphere	Europe	Africa	Asia & Mid-East	Australia
Transportation	4,801	993	546	1,074	2,131	58
(a) railroads	1,928	194	272	415	1,006	42
(b) roads	2,223	731	156	441	895	—
(c) shipping	12	—	12	—	—	—
(d) ports and waterways	506	45	98	168	188	7
(e) airlines and airports	22	—	7	—	6	9
(f) pipelines	110	23	—	50	37	—
Electric power	4,610	2,268	672	520	1,002	148
Telecommunications	355	101	40	28	185	—
Agriculture, etc.	1,713	450	157	268	838	—
Industry	2,129	220	570	249	1,090	—
Water supply	146	43	4	25	75	—
Education	263	55	—	142	65	—
General development, Ind. Imports	1,132	—	100	40	684	309
Post-war reconstruction	497	—	497	—	—	—
Project preparation	14	—	—	7	7	—
Grand Total*	15,659	4,130	2,585	2,352	6,077	515

* Does not include \$100 million loan to IFC.

Note: Multipurpose loans are distributed according to each purpose and not assigned to the major purpose. Detail may not add to totals because of rounding.

APPENDIX 2

*World Bank Loans and IDA Credits
Ports and Waterways Projects*
Totals by Countries (as of March 31, 1970)

Country	Amount (US \$ million, net)
<i>Africa</i>	
Congo (ex Belgium)	5.58*
Congo (Brazzaville)	11.60*
East Africa	40.00*
Guinea	22.40*
Liberia	3.60
Mauritania	2.50*
Nigeria	13.50
Ruanda - Urundi	2.10*
Senegal	4.00
South Africa	1.78*
Sudan	3.20*
Tunisia	15.49
United Arab Republic	56.50
Total: Africa	<u>182.25</u>
<i>Asia & Middle East</i>	
Burma	13.94
China	2.18
India	75.07
Israel	27.41
Pakistan	38.90
Philippines	7.38
Singapore	15.00
Thailand	7.66
Total: Asia & Middle East	<u>187.54</u>
<i>Western Hemisphere</i>	
Ecuador	13.00
Honduras	4.80
Nicaragua	3.20
Paraguay	3.19
Peru	21.07
Total: Western Hemisphere	<u>45.26</u>
<i>Europe</i>	
Belgium	30.00
Cyprus	11.50
Spain	40.00
Turkey	16.30
Yugoslavia	.60*
Total: Europe	<u>98.40</u>
<i>Australasia</i>	
New Zealand	6.72
Grand Total	<u>520.17</u>

* Part of a multipurpose loan.

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