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Power- Comparative Review

1961-1969

NOTE ON TREATMENT OF PRICES IN COLOMBIA OPERATIONS EVALUATION

1. The general level of prices in Colombia in 1968 was somewhat more than five times the level prevailing in 1950, while the average official exchange rate in 1968 was some eight times the fixed rate ruling in 1950. The disparity between the rate of domestic inflation and the rate of official exchange devaluation relates principally to the period before 1957. Since the devaluation of more than 100% in that year (following the end of the coffee boom) inflation and devaluation have more or less kept pace, although often with considerable lags.

2. Over the period which we are studying (1949-70) there have been frequent changes in the exchange regime of Colombia. A multiple exchange rate system has prevailed over most of the period and there has been varying reliance on quantitative restrictions of imports of goods and services.

3. It is essential, for purposes of the Operations Evaluation study, to standardize on certain procedures and certain indices. First, shortage of foreign exchange has been a major problem in the development of Colombia. Second, the World Bank has made some direct contribution to easing this problem. Third, one of our special concerns is to assess whether the indirect effect of World Bank projects (eg. on domestic savings and domestic consumption patterns) has offset to any extent the Bank's direct contribution to easing the foreign exchange constraint. For these three reasons we are particularly interested in treating project costs and benefits directly related to Colombia's foreign exchange position separately from those which are very little related to foreign exchange expenditures and earnings.

4. In analysis of all projects and sector programs it is therefore extremely important, as a first step, to identify the direct foreign exchange componet of construction and operating costs and of project benefits (eg. imported equipment and spare parts, imported skills, and, among benefits, crops or manufactured goods which are actually exported). Naturally, in Colombian accounts, foreign exchange expenditures are normally shown in pesos. Indications are sometimes given of the U. S. dollar exchange rate used. If they are not, then the rates given in column (2) of Table 1 attached may be used for reconversion into dollars, when required. Table 2 shows monthly exchange rates since 1950 which may be useful if information is available about the month of expenditure or if there is ambiguity in the records as to the exchange rate actually used; only the official market rate (first line where there are two lines) and, for recent years, the exchange certificate rate (third line) should be used since those were the rates at which almost all transactions with which we are concerned took place or would have taken place. In assessing the rates at which transactions in particular years took place special care should be given to 1957, when there was a very sharp change in the official exchange rate, and to the years since 1965, when the exchange certificate system was introduced. Normally, however, it should be perfectly satisfactory to use the annual rates given in column (2) of Table 1.

5. Secondly, in analysis of costs and benefits, special attention should be given to seeing whether certain items recorded in pesos and produced (for inputs) or consumed (for outputs) within the country should not also be treated in terms of their foreign exchange impact. Instances of items with important indirect impact on the balance of payments are: gasoline and oil which would otherwise have been sold abroad, motor vehicles or electrical transformers which are made domestically but with high import component, steel produced by Paz del Rio and consumed domestically which would otherwise have been imported, crops produced as a result of a project and sold to a domestic manufacturer for processing for export. It will only be worth examining major inputs and outputs from the point of view of their indirect impact on the balance of payments. The final decision as to how to treat any particular items must depend on a specific judgment as to their ultimate use and, in the case of inputs, alternative use, taking account of world market conditions. It may be appropriate in some cases to treat part of the price as a foreign exchange item and part as a domestic peso item.

6. All cost-benefit analyses will be carried out in terms of 1968 prices, and the attached tables are prepared in such a way as to facilitate conversion of year-by-year figures into 1968 values.

7. Peso costs and benefits should be revalued to 1968 by using the factors given in column (6) of Table 3, except in the case where a clearly more appropriate specific price index is available for the costs in question; if this is the case or, for any other reason, the factors given in column (6) are not used attention should be explicitly drawn. The factors given here are based on the GDP deflator. This is considered the best index for present purposes because of its wide base and broad and changing composition and because it refers more clearly than most other indices to peso costs and prices. The principal differences with the other major price indices and deflators given in columns (1) - (3) of Table 3, especially marked in the pre-1958 period, result mainly from the fact that they cover items directly imported.

8. Direct and indirect foreign exchange costs should be dealt with in various alternative ways in all economic analyses. Table 5 shows, year by year since 1950, the factors which should be used for converting US$1.00 of costs or benefits in any year into pesos of 1968 value; the factors do not of course make any allowance for time-discounting, which must be carried out as a separate exercise. Five alternatives, all of which should be used in all principal analyses, are given, and they are explained below. Transfer payments related to foreign exchange, such as tariffs and prior deposits on imports, should be disregarded in all these analyses.

9. Procedure (1) represents a largely financial approach, converting dollars at the official exchange rate which prevailed in the year in question and adjusting to 1968 value by the general peso inflation rate in the interim (the GDP deflator).

10. Procedure (2) represents a more long-sighted financial approach, especially relevant where the mainfocus is on the replacement costs of the goods provided or where the costs to Colombia of the project financed by the Bank are seen in terms of loan interest and repayment in the future. An attempt has been made to allow for dollar inflation in the 1950s and 1960s,

by using an I.F.S. index of dollar import prices for Latin America (see Table 4). Conversion back into pesos is made at the official rate prevailing in 1968.

11. Procedure (3) represents a rather short-sighted economic approach, suitable for use in answering the question whether the project in question turned out satisfactorily in light of the actual scarcity value that foreign exchange can be seen in retrospect to have had each year. Use is made, as in procedure (1), of the peso inflation rate (GDP deflator) but the foreign exchange rates used are those developed by Alberto Musalem. His approach is essentially to measure the peso price at which imported goods had to be sold in order to balance supply and demand for such goods each year; this cannot be done directly because, while information is available about the premiums on prices of imported goods which were collected in the form of tariffs and prior deposits on import licenses, no such information is available about the implicit or explicit mark-ups which importers gained due to scarce supply of imported goods. To overcome this problem Musalem uses an ingenious technique; he builds into his import demand equation a variable representing the intensity of effective quantitative restrictions. A small downward adjustment is made to the resultant figures to allow roughly for the likely elasticity of supply of minor exports in past years -- in addition to a small smoothing adjustment for inventory fluctuations. The resultant series is a reasonable approximation to the actual scarcity value of foreign exchange in Colombia in each year, all other aspects of the economy assumed unchanged.

12. Procedures (4) and (5) are very similar to one another and may represent the most critical long-run economic test for the projects we are investigating. They differ only in being based on alternative estimates of the dollar price index of Colombian imports; both indices are presented in Table 4. The BOR index is based on a very thorough study and is used in Colombia's national income accounts. It is scarcely credible in that it indicates that the dollar price of imports is lower now than in almost all years between 1951 and 1961. For this reason the I.F.S. index is also used. It, however, indicates only an extremely slight rise in dollar price of imports; at least it would seem to stick on the more conservative side of whatever, rather unsatisfactory, evidence is available. The dollar-peso exchange rate used in both of these cases is double the official 1968 average rate of 15.90 pesos to the dollar. This is a rough estimate based on the fact that Musalem's figure (see Table 1) may be somewhat on the high side, mainly as a result of his equation being based on the whole period 1950-67 during which considerable import-substitution took place and the marginal propensity to import appears to have declined. Also important in selecting a ratio of 2:1 between scarcity and official prices of foreign exchange is that whatever tentative work Planeacion has been able to accomplish in this field leads them to think that, for practical purposes, a ratio between 2:1 and 2.5:1 is the best assumption.

13. It may be appropriate to carry out further analyses similar to those described under procedures (4) and (5) but assuming different ratios between scarcity and official prices of foreign exchange. Planeacion is doing further work on the whole subject which may give some guidance. However, the five alternatives adopted here seem to give a reasonable range.

14. It should be noted that the principal difference between procedures (1) and (3) on the one hand, both of which use annual exchange rates, and the others, all using a single exchange rate is the perspective adopted. The first two mentioned take a very short-sighted view, even more short-sighted than a planner might actually have been expected to take. The others take a very long view and ask rather whether, given the ups and downs in the scarcity or abundance of foreign exchange, investments were good when the period is seen as a whole -- creating the (present) 1968 situation with regard to foreign exchange as an outcome. The first view may be too short and the second may be taking undue advantage of hindsight. But, given the way things have actually turned out, the second long view seems to provide the more important test of project-validity.

15. It should be stressed that the scarcity price approach to foreign exchange used here, with its rather strong 'ceteris paribus' assumption, does not necessarily yield at all the same results as would a linear programming approach -- in which those assumptions could be more fully relaxed. Apart from the extreme difficulty, if not impossibility, of making a linear programming approach to foreign exchange practical for policy purposes in Colombia within the time we have available, there is also some doubt as to whether an approach oriented to defining the actual scarcity value of foreign exchange over the years is not more relevant for the present, partly historical study. The main disadvantage of the scarcity pricing approach for the evaluation study is that it reflects only the targets and objectives already expressed in actual foreign exchange policy and it is hard to adjust for alternative policy objectives in the coming years.

16. However at present we see no particular reason to adjust the estimated 1968 scarcity value discussed above in light of any special future prospects or objectives. Consequently benefits and costs which arise in the years after 1968 should be treated in constant terms, using the conversion factors given for 1968 in the tables attached.

17. Finally, it should be pointed out that the assumption underlying all of these approaches is that the foreign exchange provided by the Bank would have been available for other projects, if not spent on the projects it was spent on. These other projects could have been in Colombia so that, even though the Bank was a fairly large supplier of foreign exchange to the country, it seems satisfactory to work in terms of a marginal approach. If research turns up a complete absence of potential alternative projects in Colombia, this point of view could need revision.

18. It was stressed earlier that the factors given in the attached tables make no allowance for time discounting. For purposes of the present study we do not propose to draw any distinction between the social rate of time discount and the opportunity cost of capital, but to use a single unified social discount rate. Harberger has made some rough estimates of the return on capital in the public and private sectors in Colombia in the 1960s (A. C. Harberger, "La tasa de rendimiento de capital en Colombia," Revista de Planeacion y Desarrollo, October 1969) and Alberto Musalem quotes the average annual yield (in relation to market prices) of a selected group of stocks quoted on the Bogota market 1950-67 (Alberto Musalem, "Demand for Money and Balance of Payments: The Experience of Colombia 1950-67," Harvard DAS 1970).

These studies suggest that a rate of return on capital of 10% per annum would be appropriate to use as the basic case; alternatives of 8% and 12% would provide a suitable range.

19. No reference has been made in the preceding paragraphs to the use of a shadow price for labor, although there is no question but that the underutilization of labor has been and remains a very serious problem in Colombia. However little work appears to have been done on the matter of an appropriate shadow price in Colombian circumstances, and it seems better to treat the problem of labor costs and labor utilization on an ad hoc basis adapted to the specific circumstances of the different cases and sectors studied in our evaluation. This does mean that special attention should be given to the use of labor in our projects, to techniques of production selected, and to any employment generated as a direct or indirect result of our projects.

C. R. Willoughby
Washington, D. C.
February 8, 1971

Table 1

COLOMBIA: FOREIGN EXCHANGE RATES

	(1) Av. Annual Rate for buying U. S. Dollars in Colombia in non-preferential official market (pesos per dollar)	(2) Approximate Av. Annual Official Rate for imports of goods & services weighted by vol. of transactions (pesos per dollar)	(3) Exchange Rate Index based on column (2) 1958 = 100	(4) Estimated Scarcity Price of Foreign Exchange a/	(5) Ratio of Scarcity Price to Official Price 4/2 x 100
1948	1.76	1.76	27.1		
1949	1.96	1.96	30.2		
1950	1.96	1.96	30.2	4.12	210
1951	2.39	2.39	36.8	4.64	194
1952	2.51	2.51	38.6	4.81	192
1953	2.51	2.51	38.6	3.76	150
1954	2.51	2.51	38.6	2.88	115
1955	2.51	2.51	38.6	3.43	137
1956	2.51	2.51	38.6	4.10	163
1957	5.06	4.20	64.6	8.33	198
1958	6.41	6.50	100.0	10.82	166
1959	6.40	6.50	100.0	13.38	206
1960	6.65	6.60	101.5	12.31	187
1961	6.70	6.70	103.1	12.42	185
1962	6.90	6.80	104.6	14.14	208
1963	9.00	8.90	136.9	19.47	219
1964	9.00	9.00	138.5	21.46	238
1965	10.50	9.90	152.3	29.04	293
1966	13.50	13.00	200.0	30.21	232
1967	14.73	14.30	220.0	37.86	265
1968	16.38	15.90	244.6	34.79	219
1969	17.37				

a/ Alberto Musalem, "On estimating the Opportunity Cost of Foreign Exchange in Colombia, 1950-70," (December 29, 1970).

Table 2

EXCHANGE RATES OF THE OFFICIAL DOLLAR, CERTIFICATE OF EXCHANGE, AND FREE MARKET

(Pesos per Dollar)

Year \ Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Average
1950	1.96	1.96	1.96	1.96	1.96	1.96	1.96	1.96	1.96	1.96	1.96	1.96	1.96
1951	1.96	1.96	2.3513	2.51	2.51	2.51	2.51	2.51	2.51	2.51	2.51	2.51	2.3878
1952	2.51	2.51	2.51	2.51	2.51	2.51	2.51	2.51	2.51	2.51	2.51	2.51	2.51
1953	2.51	2.51	2.51	2.51	2.51	2.51	2.51	2.51	2.51	2.51	2.51	2.51	2.51
1954	2.51	2.51	2.51	2.51	2.51	2.51	2.51	2.51	2.51	2.51	2.51	2.51	2.51
1955	2.51	2.51	2.51	2.51	2.51	2.51	2.51	2.51	2.51	2.51	2.51	2.51	2.51
					3.98	4.12	4.16	4.09	3.89	3.9	4.09	4.13	4.04
1956	2.51	2.51	2.51	2.51	2.51	2.51	2.51	2.51	2.51	2.51	2.51	2.51	2.51
	4.34	4.21	4.28	4.39	4.75	4.67	4.88	5.03	4.54	5.07	6.24	6.83	4.95
1957	2.51	2.51	2.51	2.51	2.51	4.86	4.81	4.90	5.13	5.10	5.22	5.38	5.06
	6.3	6.11	5.6	7.0	6.84	6.58	5.8	5.89	5.95	6.28	6.2	6.19	6.31
1958	5.62	6.02	6.11	6.73	6.77	6.82	6.73	6.51	6.36	6.4	6.41	6.4	6.41
	6.42	6.86	7.0	7.66	7.67	7.66	8.07	8.0	7.82	7.82	7.95	8.15	7.59
1959	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4
	8.17	8.1	8.05	8.02	7.99	7.99	8.0	7.9	7.31	6.8	6.99	6.99	7.69
1960	6.4	6.4	6.52	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.65
	6.87	6.8	6.77	6.76	6.87	6.82	6.88	6.92	6.97	7.07	7.08	7.22	6.93
1961	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7
	7.26	7.43	7.97	8.1	8.26	8.32	8.51	8.69	8.7	8.71	8.76	8.84	8.28
1962	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.8145	9.0	6.7787
	8.8	8.77	8.82	8.97	8.94	8.83	8.54	8.52	8.76	9.1	10.4	11.07	9.1
1963	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9 0
	10.28	9.99	9.99	9.99	9.99	9.99	9.99	9.99	9.99	9.99	9.98	9.99	10.03
1964	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0
	9.99	9.98	9.99	9.98	9.98	9.99	9.99	9.98	9.98	10.09	12.34	12.78	10.28
1965	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0
	12.95	13.82	13.94	14.36	16.76	18.77	19.12	19.21	18.77	17.78	18.15	18.39	16.49
									13.5	13.5	13.5	13.5	13.5
1966	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0
	18.16	18.15	17.88	17.88	17.47	16.48	16.01	16.34	16.36	16.27	16.27	16.3	16.96
	13.5	13.5	13.5	13.5	13.5	13.5	13.5	13.5	13.5	13.5	13.5	13.5	13.5
1967	9.0	9.0											
	16.3	16.3	16.3	16.3	16.3	16.3	16.3	16.3	16.3	16.3	16.3	16.3	16.3
	13.5	13.5	13.53	13.82	14.08	14.42	14.63	14.89	15.17	15.44	15.67	15.78	14.73

Source: Informe del Gerente del Banco de la República, 1967.

Note: The first line for each year corresponds to the official market, the second to the free market or the official and the third to the exchange certificate.

Table 3

COLOMBIA: DOMESTIC PRICE INDICES[a/]

	(1) Construction Materials in Bogota (1958=100)	(2) GFCF[b/] Deflator (1958=100)	(3) General Wholesale Prices (1958=100)	(4) Wage-workers Consumer Prices (1958=100)	(5) GDP Deflator (1958=100)	(6) Factor to be used for Conversion to 1968 Prices
1948			40.6	45.8		
1949			44.7	48.9		
1950		40.1	48.6	58.7	53.5	5.31
1951		43.2	53.9	64.2	59.0	4.82
1952		45.0	56.1	62.6	59.9	4.75
1953	65.8	44.5	58.8	67.2	62.8	4.53
1954	69.3	46.3	62.9	73.2	69.9	4.07
1955	71.7	48.3	63.9	72.6	69.8	4.07
1956	79.3	53.9	70.2	75.2	75.3	3.78
1957	90.0	75.3	85.1	88.3	88.2	3.22
1958	100.0	100.0	100.0	100.0	100.0	2.84
1959	111.7	108.9	109.6	108.2	106.6	2.67
1960	119.2	114.7	114.2	114.3	115.7	2.46
1961	126.2	121.7	121.6	124.0	125.2	2.27
1962	140.6	133.4	124.9	129.3	133.5	2.13
1963	179.6	169.3	157.7	164.7	164.5	1.73
1964	200.8	181.6	185.3	193.8	191.4	1.49
1965	216.7	211.3	200.6	207.5	208.9	1.36
1966	249.3	253.2	235.5	242.1	240.1	1.18
1967	266.9	284.2	251.6	261.6	261.4	1.09
1968	301.0	315.8	267.3	281.0	284.3	1.00
1969	328.9		285.2	300.5		

a/ From DANE Monthly Statistical Bulletins and Revista del Banco de la Republica.

b/ Gross Fixed Capital Formation

Table 4

COLOMBIA: DOLLAR PRICE INDICES FOR IMPORTS

	(1) IFS a/ Dollar Price index for Latin American imports (1958 = 100)	(2) Factor based on IFS Index for Converting foreign exchange prices to 1968 dollars	(3) BOR b/ Index of Real Unit Value of Colombian imports (1958 = 100)	(4) Factor based on BOR Index for Converting foreign exchange prices to 1968 dollars
1948				
1949	99	105		
1950	85	122	82	118
1951	100	104	101	96
1952	99	105	98	99
1953	97	107	94	103
1954	96	108	100	97
1955	97	107	98	99
1956	99	105	106	92
1957	103	101	101	96
1958	100	104	100	97
1959	99	105	100	97
1960	99	105	100	97
1961	99	105	101	96
1962	102	102	96	101
1963	99	105	95	102
1964	101	103	94	103
1965	105	99	93	104
1966	103	101	93	104
1967	103	101	94	103
1968	104	100	97	100

a/ An index derived from International Monetary Fund "International Financial Statistics" monthly bulletin for December 1954, July 1956, July 1959, July 1963, October 1969 and January 1971. The index refers to the whole of Latin America and is an appropriately weighted average of the export price indices of the main supplying countries, with the U. S. bulking very large. The index is adopted here on the reasonable assumption that Colombia would correspond reasonably well to the Latin American average in this respect.

b/ Abstracted from Manuel Romero Ramirez, "Indices de comercio exterior de Colombia 1950-67," Banco de la Republica, Departamento de Investigaciones Economicas 1968. This report uses on ECLA index for the years 1950-60 inclusive and special calculations, on the basis of the recorded price of standard physical quantities of certain imported items, for the period 1958-67. The figure given in the table for 1968 is derived implicitly from the Banco de la Republica's national income estimates which, in turn, for the earlier years use Romero's figures.

Table 5

COLOMBIA:
ALTERNATIVE APPROACHES FOR HANDLING FOREIGN EXCHANGE COSTS & BENEFITS IN EVALUATION

(value in 1968 pesos of US$1.00 invested each year, without allowance for time-discounting)

	(1) Convert at official rate each yr. & use peso inflation rate	(2) Use IFS import price index and 1968 official exchange rate	(3) Convert at scarcity rate each yr. & use peso inflation rate	(4) Use IFS import price index & twice 1968 official exchange rate	(5) Use BOR import price index and twice 1968 official exchange rate
1950	10.41	19.40	21.88	38.80	37.52
1951	11.52	16.54	22.36	33.07	30.53
1952	11.92	16.70	22.85	33.39	31.48
1953	11.37	17.01	17.03	34.03	32.75
1954	10.22	17.17	11.72	34.34	30.85
1955	10.22	17.01	13.96	34.03	31.48
1956	9.49	16.70	15.50	33.39	29.26
1957	13.52	16.06	26.82	32.12	30.53
1958	18.46	16.54	30.73	33.07	30.85
1959	17.36	16.70	35.72	33.39	30.85
1960	16.24	16.70	30.28	33.39	30.85
1961	15.21	16.70	28.19	33.39	30.53
1962	14.48	16.22	30.12	32.44	32.12
1963	15.40	16.70	33.68	33.39	32.44
1964	13.41	16.38	31.98	32.75	32.75
1965	13.46	15.74	39.49	31.48	33.07
1966	15.34	16.06	35.65	32.12	33.07
1967	15.59	16.06	41.27	32.12	32.75
1968	15.90	15.90	34.79	31.80	31.80
	259.52	316.29	524.02	632.51	605.48

APPRAISAL AND SUPERVISION OF PROJECTS

By Hugh B. Ripman
International Development Association

(Speech given in Taipei in March, 1961)

Introduction

When Mr. K.T. Li first suggested that I should give a talk on this subject, I had thought that he was going to gather perhaps a dozen or twenty people to listen to me, and so I was rather surprised, and a little taken aback, when I discovered that I would have to speak to an audience much larger than this.

As I look at this large and distinguished group gathered here today, I feel very much aware of my inadequacies. I am sure that there are among you persons who are more familiar than I with every single subject upon which I shall touch in the course of my talk. Perhaps my only distinction may be that I can bring all these different subjects into relation.

In the course of the time available, we cannot review the whole of the experience in the appraisal and supervision of projects gained during the last fifteen years in the work of the World Bank. We were lucky in the Bank, because at the beginning of our operations we had time to sit back and talk about the problems we expected to meet, and to think out the principles we should apply in meeting those problems. At that time we laid down certain principles which have governed our work ever since. We have refined and extended the application of those principles to new circumstances and new types of problems, but the principles themselves are the guiding-lines we use today both in the World Bank, and in its new affiliate, the International Development Association, which has only just commenced operations.

We have, of course, during these fifteen years of work, made many mistakes; but we have tried to learn from our mistakes and not to repeat them. I have no doubt we shall make more mistakes, and have plenty of scope for learning from them, in the future also. We do not pretend to have the last word to say about this work of appraisal and supervision of projects. We can only present to you the fruits of fifteen years' experience in work upon projects of many kinds in a large number of countries.

Cynicism Necessary

One thing which this experience has taught us is never to take anything for granted. It is prudent to be very cynical in appraising projects. I have known, for instance, countries where the local economists applied the most modern techniques of mathematical analysis to their statistical data, even used computing machines to arrive at their results.

These results appeared to be very precise - until one had questioned the accuracy of the statistical data which the economists had started from, and found that they contained a margin of error of the order of magnitude of twenty percent. It is not much use applying refined statistical techniques to data as unreliable as this. But if one is not sufficiently cynical in his approach, one may be taken in by the apparent precision of the results.

Qualifications and Experience Needed

In our work in the World Bank and in the International Development Association we have found it necessary to use the coordinated efforts of men with three different types of professional skill and experience.

In the first place, we use men trained in economics. We use both the long-haired or general type of economist, and the short-haired, or applied type-man who is specialized, for instance, in the economics of electric power, or of transportation or of industry.

The second type of man we use has engineering qualifications. We do not of course carry out the actual engineering of the projects which we finance. Our task is to scrutinize the engineering work that has been done by others and to see that it has been done in a proper way. Since we cannot staff ourselves with specialists in every kind of project which we may be called upon to investigate, we sometimes hire consultants to supplement our permanent staff.

The third kind of specialist we use for appraisal and supervision work we call financial analysts, men who have a general training in accounting and banking and particularly in investment banking.

All these three types of men-economists, engineers and financial men - work in very close contact together. And in the end, after they have been working together for a certain number of years, a new type is produced. I think you know in Taiwan the advantages of cross-fertilization between different types - you have hybrid corn and hybrid hogs. Well, we produce a kind of hybrid investigator in the World Bank and in the International Development Association.

A Warning

I am going to speak to you about many aspects of appraisal and supervision. Now my difficulty is this - that if I took any one of these aspects I could talk to you about it for the whole two hours. So I have to compress what I have to say very severely, and of course I can only do this at the expense of precision. I shall have, of necessity, to make many broad generalizations which are not true in every case. So you must understand that I do not wish to lay down the law about anything. The particular circumstances of a given case may justify departure from the general rule.

I shall not be dealing with the peculiar problems characteristic of certain important types of project - for instance, regulated industries like the electric power industry. These regulated industries have their own particular problems, which have exercised us in our work and still continue to exercise us. Nor do I intend to cover the specific problems involved in weighing up the costs and benefits of non-revenue producing projects, such as highway and flood prevention projects. Much of what I shall have to say applies to these types of project, but I have to leave their peculiar and characteristic problems aside for today.

General Approach to Appraisal

In appraising a project we do not in the World Bank simply take the relatively narrow point of view of a potential creditor. We put ourselves in the situation of management, and therefore do not confine our scrutiny to the project itself, but are interested in all the circumstances surrounding it, the whole economic complex of which the project will form a part. In practice, this means that we investigate six different aspects of the project, namely:

1) The economic aspect;
2) The technical aspect;
3) The managerial aspect;
4) The organizational aspect;
5) The commercial aspect; and
6) The financial aspect.

I am now going to speak to you about each of these aspects in turn.

The Economic Aspect of Project Appraisal

Relative Priorities of Different Types of Project

Let us take first the economic aspect. Before we look at a project at all, some of our economists have already studied the whole economy of the country involved, and formed a conclusion about the relative priorities for development of the different sectors or types of economic activity. In many of the countries in which we work, it is evident that the highest priority should be given to what is called the infrastructure of the economy, the development of the basic services such as transportation and power. Agricultural activities of course rank high in almost every country. Once these sectors have been developed to a certain extent, light industry becomes important. And when light industry has reached a certain level of development, it provides the basis for heavy industry.

1. {Infrastructure Agric
2. Light Ind
3. Heavy Ind

Once it has been established that a project is of a type that has a high priority, the question which the economist asks is this: what is the need for the goods and services this particular project is designed to produce? This question must be answered from a broad point of view. One has to investigate not only the potential demand for the goods and services in question, its direct contribution to economic development, but also the indirect benefits that may be expected from it.

Market Studies

This normally involves a market study, the amplitude of which may vary very much. If one is looking into the economics of a brick factory, for instance, it is obvious that the cost of transportation limits the market area, and so no extensive market survey is needed. But take the case of cameras or transistor radios, where transportation costs are low in relation to the value of the product; one may have to make a much wider market study. Or if, for instance, the project is for the exploitation of a source of iron ore, it may be necessary to look at the whole world market, to form a judgment about the present and prospective future relation of demand to supply, and so to come to a conclusion about the probable future price trends.

The market study may not be confined to one commodity. For instance, in considering the demand for copper, one has to take into account the prospect of competition with other materials like aluminum and plastics, which may be substituted for copper for certain uses.

Subsidy and Protection

Another aspect of the economic appraisal of projects is the question of subsidy or protection. In principle, it is a mis-direction of investments and a waste of scarce capital resources to create an industry which can only be profitable if it is protected by a large import duty or a quantitative restriction of imports. A very good example of this sort of mis-direction of investment took place in Australia, where a number of industries were created which were not at the time justified on an economic basis.

This is not to say, of course, that a certain amount of protection may not be justified in particular cases. Many of you are no doubt familiar with the classical "infant industry" argument, which makes the case for the protection of an industry in its earlier stages, if there is a true prospect of its being able to stand on its own feet without protection when it is well established.

But in principle, the moment you find that an existing or proposed industry needs a high degree of protection to operate profitably, you have a prima facie case that this industry may not be the right direction, from an economic point, for the investment of scarce capital.

Relative Scarcity of Factors of Production

Now I come to another factor that the economist has to take into account - the relative scarcity of the factors of production. It may be, for instance, that in certain countries the population has grown or is growing at a faster rate than the opportunities for productive work. Labor in consequence is cheap. Very often in the same countries capital is scarce and its price high. In these circumstances, the creation of an industry which is labor-intensive, which will provide many new jobs, has an economic advantage over the investment of the same amount of money in an industry which is capital-intensive, and which provides far fewer opportunities for new jobs. I have seen in Taiwan, for instance, a plywood factory which is very labor-intensive. For every thousand dollars invested it creates many more new jobs than the same amount of money put for instance into an iron and steel industry or a big chemical plant.

But it is not only labor that can be unemployed. Natural resources may also be lying idle, and in this case it is generally economically advantageous to create an industry that puts these idle resources to use rather than one which depends on imported raw materials, with all the uncertainties that are involved in such dependence.

Indirect Benefits

I come to another point. As I said earlier, the investigator has to look at the project in all its relations to other economic activities. This means that indirect benefits to be expected from the project also have to be taken into account. For instance, the establishment of a particular project may give opportunities which did not before exist for the creation of related enterprises, maybe supplying components or raw materials, maybe for further processing its products. For instance, a bicycle industry may be set up, and may give opportunities to make bicycle tires. Or a plastic materials factory may form the basis for many small plastic fabricators.

Prestige or Fashionable Projects

One thing the economic investigator has to keep his eye open for is the appeal of certain projects which are regarded as carrying with them a certain prestige, or are simply fashionable.

For instance, a few years ago many countries became interested in nuclear power plants. We even financed one ourselves, which is now under construction in Italy. But today it is turning out that the operating cost of these plants is not likely to have the advantage which was expected over the costs of power plants based on oil, since the discoveries of oil made in recent years, and especially those in the Sahara Desert, have postponed for a long time a rise in the price of oil which was previously thought to be inevitable.

There is a feeling in many of the less developed countries that they are not, so to speak, grown up unless they have their own integrated iron and steel industry. But to establish such an industry without the necessary market for its products is one of the most wasteful possible investments that a developing country could make. We are at the moment dealing with a case like this at the World Bank, where such an iron and steel industry was set up a number of years ago, and set up in circumstances in which it could not have been successful. When we first heard of this steel mill, it could only be kept in operation by continuous government subsidies to cover its financial losses. We are now attempting to find a way to turn this white elephant, which is unusual and expensive but not profitable, into a useful water buffalo, and we hope that we may be successful, but it is a very difficult task.

Now I have two more things to say about the economists' work in appraising projects.

Comparison of alternatives in all functions in projects

Effects on Balance of Payments

The first is that we should take into account the effect which the project is expected to have on the balance of payments - either by way of generating exports or by way of substituting for imports. In forming his judgment from this point of view, the investigator must take all factors into account - for instance, the necessity to import on a continuing basis raw materials or fuel, and the repayment of foreign debt.

The Timing of Projects

And the last point I have to make concerns the question of timing. It may, for instance, be quite true that looking into the future one may see that a certain scale of project will be justified by the demand in 15 or 20 years' time. But it will seldom be justified to invest scarce capital in a project when some of that capital will not be productive for many years to come. It would not matter if capital were so plentiful that it would earn practically nothing if put to other uses - but I need not remind you how far this is from the fact in a country where you can get paid 20% per annum on a two years' bank deposit. In such circumstances to lock capital up unproductively in an investment that will not yield benefits for several years to come is foolish.

Now that finishes all that I have to say this afternoon about the economic aspect of project appraisal, and I now turn to the second aspect, the technical aspect.

The Technical Aspect of Project Appraisal

This aspect is the responsibility of engineers, or other specialists experienced in the techniques of the proposed projects.

Scale of Operations

The first thing is to decide whether the proposed scale of operations is justified. There are certain industries which can only work economically on a certain minimum scale, and to establish such an industry on any more restricted scale is a mis-direction of scarce capital. The minimum scale varies very much, of course, as between different industries. Usually it is in the most capital-intensive industries that the minimum economic scale is very large. But of course the proposed scale of a project must be looked at not only from the point of view of technical efficiency and of reducing costs of production; it must also be related to the prospective demand for its product. And here again the question comes up: How far ahead should we plan, how far ahead can we afford to plan?

It may be very tempting to create a project which is designed to satisfy the demand for the next 10 or 15 years, and were capital so plentiful that its cost was negligible, it might be wise to do so. But in circumstances where capital is scarce and its price is high, it may be much better to divide the project into two or more stages, so that the capital invested in each stage can get to work and produce benefit as soon as possible.

Operational Techniques

The investigator also has to think whether the proposed methods and processes are appropriate. In a type of activity in which rapid technological progress is being made, and new and improved processes and equipment are being developed, one has to be careful to take account of technological obsolescence. Otherwise one may find one has put money into equipment which may be completely out of date in four or five years' time. In America and Europe today, for instance, no company will invest in a plant for certain types of chemical manufacture unless there is a prospect that profits will be high enough to pay back the cost of the plant within five years. This, of course, is an extreme case, in which technological improvement is occurring very rapidly. But in appraising any kind of project, this factor has to be taken into account.

Plant Lay-out and Location

After the investigator has satisfied himself with the proposed scale of operation and the methods and processes to be employed, he has to consider the planned lay-out of the plant. In this connection we have found many cases in which the possible requirements of future expansion had not properly been taken into account. This is something which must not be forgotten. Otherwise, when the time comes for expansion, efficiency may be reduced by bottlenecks in the flow of production from one process to another, and the whole problem of internal transportation may throttle expansion beyond a certain point. Here is a case where it may be very profitable to spend more money now in order to save money at a later stage. If in the future you will need more land to expand a factory, it may be better to buy it now, and leave enough room in planning the lay-out of your buildings to put in extra units later on. Of course, in some countries I have found it to be the case that the promoters of projects wish to borrow money to buy more land than they are ever likely to need, purely as a means of speculating in land values. This is a thing that one should be careful to prevent.

Now we come to the question of location. Here the investigator must take into account the relation of the proposed location to the sources of raw materials and other factors of production, and to the markets for what the project will produce. The sources of power, of fuel, of skilled and unskilled labor all have to be considered in this connection. There may be advantages in locating near a large city, where public utilities are available, and housing for workers presents no problem. But in some cases the economics of the case demand that the project be set up close to the sources of raw material, and then it may be necessary to include in the project the whole cost of building a town, with all the housing, schools and utilities involved. The Tata Steel Company in India, for instance, owns a town with 250,000 inhabitants.

There is one other thing that one has to take account of in this connection. Sometimes some outside authority will have to build the road or railway branch leading to the project, or a transmission line bringing

power to the site, and the investigator has to make sure that arrangements have been made for this, and that the progress of this kind of work is coordinated with the needs of the project.

Need for Consultants

The investigator also has to look into the proposed arrangements for doing the engineering work on the project. The first thing he must ask himself is whether the people responsible for the project are themselves capable of doing their own engineering work, or whether they will need help, for instance, from an engineering consultant. You may often find that a factory, for instance, maintains a very competent engineering department which is fully capable of understanding and solving the problems of production and maintenance, but is not qualified to carry out all the engineering tasks required for the design and construction of the proposed expansion of the factory. Of course, the amount of work consultants may be needed for varies very much from project to project. It runs from the design of the plant, the preparation of specifications and invitations to bid, the analysis of bids received and the recommendation of which bidder the contract should be awarded to, the inspection of equipment purchased, arrangements for shipping and insuring imported equipment, the supervision of construction and installation, and even the initial control of operations of the completed project. Consultants cost money; but their services frequently save much more than they cost.

Construction Schedule

The investigator now has to satisfy himself that the timing of construction has been realistically planned. This involves a careful scrutiny, for all the different main physical elements of the project, of a construction schedule which takes all the necessary steps into account, from the engineering design work to the installation and testing of equipment.

Cost Estimates for Construction and Operation

Parallel with the construction schedule there must be a budget, in which the estimated cost is calculated for all the different phases of construction and for all the main physical elements of the project. It is part of the engineering investigator's task to scrutinize this budget very carefully. We have often found that in estimating costs the optimism of promoters frequently leads them to forget that everything will not always go according to plan. Any project that starts out without taking any account of the unforeseen is almost certainly headed for trouble. So in making cost estimates one always has to be on the pessimistic side, and to provide something to take care of delays and accidents and changes in design and unfavorable movements of prices. The investigator has to satisfy himself that enough money has been provided for spare parts, for escalation, for interest during construction and - I emphasize this particularly - for working capital. Very frequently we find that the amount of working capital that will be needed has been under-estimated. I shall come back to this subject of working capital when I deal with the financial aspect of appraisal.

After having satisfied himself that the cost estimates for the construction period are reasonable, and have taken everything necessary into account, the investigator then turns to the estimates of the costs of production or operation. It is useful at this stage, of course, as also with the construction cost estimates, to compare the estimated costs with the actual costs of other similar projects, and if there is any major discrepancy, to find out its cause. The costs of operation need to be investigated for different levels of production. Many promoters expect that they will be able to produce and sell at capacity the moment the last brick is laid. This is seldom if ever true. So in estimating costs of production one has to take this into account.

Well, that is about all I have to say on the technical side.

Question:

You spoke about processes and methods. In your opinion, is it better, in relatively under-developed countries, to use an old-established process with a lower royalty or a new process with a high royalty?

Answer:

This is the kind of question which is impossible to answer in general. But I am quite sure that the most modern processes may not always be the best processes to adopt in underdeveloped countries, and in particular the type of processes which are in general known as automation. Frequently the incentive to develop new processes is the high cost of labor in America and Europe. Where labor is cheap, one always has to make a judgment how far it is economical to replace a man by a machine - particularly by an expensive and complicated machine. Even in America I read in the newspaper recently that some of the big industrial companies who followed the fashionable practice of employing mechanical brains, or computers, a few years ago are now coming to the conclusion that their costs have risen, instead of fallen, as a result, and are now going back to their former methods.

In general I would say that in a less developed country, the simpler the process the better. More complicated processes can get you into very serious trouble and expense when they go wrong. For instance, I remember visiting a plant in a country not too far from here, which was fitted out with all kinds of very modern recording instruments, designed to give the operators all kinds of information they needed in running the plant efficiently and keeping the cost of production down. This plant had been running five years when I visited it, and three-quarters of these complicated instruments were not working at all. Nobody knew how to repair them. Well, that is not a sensible way to work. You have to weigh up the benefits of this sort of progress with the costs of those benefits. If one does not have qualified men to run and maintain complicated machines, then it often is better to adopt a simpler, though less up to date, process.

Question:

In estimating cost, we have in the past been faced by difficulties on account of our multiple exchange rate system in Taiwan. Now, fortunately, we only have one foreign exchange rate. But we still have a large number of different interest rates. What rate of interest should we use in evaluating projects?

Answer:

This is not at all an easy question to answer. I and my colleagues, in the weeks that we have been here, have been scratching our heads a good deal about this sort of question. But we are quite clear about one thing. The scarcity of capital is one of the outstanding features of Taiwan's economy at the moment, and in looking at projects in this country this scarcity of capital must never be lost sight of. Any project which can produce a reasonable benefit only if it obtains money at say 3% or 4% per annum should certainly not be undertaken at all. Of course this is a complicated question. Take agricultural projects, for instance. There is no country in the world which does not subsidize agriculture in one way or another, for one reason or another, because the interests of government are not purely economic. Apart from anything else, no country wishes to depend too much on imports for its essential food requirements.

In general, it is necessary always to measure the benefits of the use of capital in a project with the scarcity of capital, and I would say in general that any project in this country that does not promise to return at least 12% per annum should be looked into with a very critical eye.

The Managerial Aspect of Project Appraisal

It is in evaluating the quality of management that the investigator has one of his hardest tasks. Whereas in other aspects of appraisal you have yardsticks of various kinds to judge by, in appraising management there is no rule of thumb that you can apply - or at least, if there is, we in the World Bank have not yet met it.

One may get, of course, quite a lot of evidence of the quality of management by examining the past record and present position of a business. One may also get important clues from the way in which the project is presented, and the way in which questions about the project are answered. But in general, the appraisal of management is an art and not a science, and the investigator has to rely on his personal judgment, based upon his own experience of men and affairs.

One word of caution is in place here. Any project which depends for its success on a one-man management is a risky affair, and one should try to find a way to cure that risk.

In cases where there has been no satisfactory arrangement made for management, one has to see what can be done. This case arises, for instance, where it is proposed to set up a new industry of a kind in which no local experience exists. Then it may be necessary, at least for the initial years, to import management from abroad. This generally costs a good deal, but to do without it may be much more costly. In many cases, the ideal arrangement is a joint venture, between local investors and an established company abroad who may provide know-how and management skills. Or one may hire a manager, and sometimes key staff to aid him. In this case, it is most important that the foreign manager and staff should train local men as soon as possible to take their place.

The Organizational Aspect of Project Appraisal

Well, now let us turn to the organizational aspect. This can be divided into two different stages - one dealing with the organization that is required for the construction of the project, and the other dealing with the organization required for the operating stage.

The Construction Stage

In some industries, for instance in the electric power industry, the process of construction is more or less continuous. Before one project is finished, it is already necessary to have started on the next project. In such a case it is usually best for the electric power company to have its own construction department, which will normally perform all the necessary functions, though sometimes needing the aid of consultants to tackle a very large project, or one with unusual engineering features.

But of course a factory working on a relatively small scale, although it may need an engineering department which can handle the problems of operations and maintenance, has to make special arrangements if it is faced with organizing a major expansion of its plant, and in this case the necessary talent has to be hired from outside.

The Operating Stage

Organization and Scale of Operations

One of the most typical problems facing the investigator in evaluating the proposed organization for the operating stage is the question of scale, and the need to modify organization as the scale of operations grows. The classical example is the case of the businessman who has built up a successful one-man business. He is the president, the manager, the treasurer, the secretary, the chief engineer and the salesman all rolled into one. He has been very successful and he wants to expand his business - perhaps to double its scale of operations. And he believes that the expanded business can still be run the same way. This is frequently an illusion. Once a business grows beyond a certain scale, if one man attempts to run all aspects of it, and to make every decision himself, either he will make mistakes, or else he will drive himself to illness or death. But it is often very difficult to persuade such a man that it is

impossible for him to run a big business in the same way he has run a small business.

As the scale of operations grows, the organization must grow more and more specialized. At each scale, a judgment has to be made how far centralization of functions and decisions is practicable, and how far delegation of authority and decentralization of functions would be more efficient. Several functions which could before be handled by one organizational unit have to be split between several units. As this division of functions progressively gets more specialized, organizational units multiply, and the possibility of conflicts of interest and friction between them becomes more and more of a problem. It is this difficulty of coordinating the functions of many different units which is the heart of the problem of organization, whether it be of a factory or an army or a government, and it is this difficulty that effectively sets the limit to the efficient size of an organization.

Providing the Tools of Management

One test of the efficiency of an organization is the way in which it can provide the information which management needs in order to formulate policies and take decisions intelligently. This information is the most important tool of management, and it should flow to management from every part of the organization. It is not only necessary to know the results of past operations; it is equally necessary to have forecasts which show what the future will probably bring. In order to produce this information, an organization must include an efficient system of internal controls.

In our work at the World Bank, we often ask borrowers for this kind of information. Sometimes they throw their hands up in the air and reply: "We are busy creating a project, we have no time for all this paper work." But this is time well spent. Many times we have worked patiently with borrowers for a long time to get the right kind of reports, and when we are finally satisfied, we say: "Well, now you no longer need to send us this report every month; from now on quarterly reports will be enough for us." And at this point the borrowers often say to us: "But we wouldn't think of doing without this monthly report now. We cannot think how in the old days we managed without it. We have even applied the same sort of reporting technique to all our other operations."

Management needs information promptly and regularly. But management's task may be made impossible if it is swamped with undigested or unessential information. I remember before the war I had something to do with a U.S. company working in England. They sent me every month a portfolio of charts prepared for the managing director. Well, there were so many charts, and charts with so much on them, that one couldn't possibly see the essential information. I think about 80 of these charts were prepared with great care every month. I made a study of them, and in the end cut them down to six; and these six really contained all the essential information which the managing director needed. So it is just as necessary to keep unessential information away from management as it is to supply management with the essential information.

Other Organizational Questions

Another aspect of organization with which I can only deal briefly is , for instance, the importance of good budgeting control. Here again, when an organization has been living without proper budgetary control, they are often reluctant to take the trouble to introduce it; but once the control is introduced, they very soon are surprised at how they ever got on without it.

An important aspect of good organization is the system of controlling inventories, and this in turn is closely connected with the system of controlling and scheduling production, which in its turn must be dovetailed into a regular schedule of routine and preventive maintenance. I cannot stress too much the necessity for preventive maintenance, particularly because in my experience its importance is not properly appreciated in many of the less developed countries.

One final point on the organizational side - the question of training. The investigator should always satisfy himself that arrangements for training - at all levels in the organization, from apprentices to management candidates - are taken into account in making plans for a project. Sometimes of course this training aspect is of first importance. For instance, it is not very sensible to establish projects to provide farmers with irrigation water and fertilizers if the farmers are not educated to make the best use of the water and fertilizer.

The Commercial Aspect of Project Appraisal

We have already dealt with four of the aspects of project appraisal - economic, technical, managerial and organizational. I now turn to the fifth, namely the commercial aspect. By the commercial aspect, I simply mean all that has to do with buying and selling. This aspect can be considered, like the other aspects, in two stages: the problems of the construction period and those of the operating period.

The Construction Period

In the construction stage, the investigator has to satisfy himself that the arrangements made for procuring the goods and services needed are such as to provide the buyer with the best value for his money. We have frequently found that the method of procurement best calculated to produce this result is open competitive bidding. There are certain circumstances in which another procedure may be justified, but as a general rule open competitive bidding is the best method. One word of warning may be in place here. The lowest bid does not always represent the best value. It is necessary to take account of quality, of the experience of the supplier, of the terms of delivery and payment, of the advantages of standardizing equipment, and so on before coming to a decision which is the right offer to accept.

A word about buying transportation and insurance services. In any large project, much money can sometimes be saved by centralizing control over the shipment of equipment and arrangements for insurance. I have known cases where by centralizing arrangements for insurance, and getting a number of offers from different insurance companies, many tens of thousands of (U.S.) dollars were saved in insurance premiums.

I want to mention one other thing here. Increasing competition among the industrialized countries has encouraged manufacturers in those countries to offer longer and longer deferred payment terms on the equipment they wish to sell in less developed countries. These suppliers' credits are very expensive, and although their term is very gradually getting longer, it is almost never above seven years, and this puts a heavy repayment burden on the project in its initial operating years, when it can least afford to bear this burden. I do not say that one should never buy on the basis of a supplier's credit; I just give a warning that it is generally an expensive way to obtain financial help, especially since the supplier generally quotes a higher price to protect him against the risk of giving credit.

The Operating Stage

The investigator has to make sure that thought has been given to the problems associated with buying raw materials, fuel and so forth, and with selling the products of the project in the operating stage. The terms of purchase and sale are very important. How soon one has to pay for what one buys, how long one has to wait to receive the price of what one sells - the answers to these questions have an important bearing on the amount of working capital that is necessary to carry on operations.

The arrangements made for marketing the product, and for market research, are also something into which the investigator has to inquire. Sometimes one finds that not enough thought has been given to problems in this sphere. It may be necessary to spend a considerable amount of money on advertising, to bring the product to the notice of potential buyers. It may be necessary to discuss with the users of the products possible ways of improving it. And of course the investigator has to inquire into the arrangements for solving possible conflicts of interest between those responsible for marketing and those responsible for production and for finance. The marketing people want always to be in position to deliver what they can sell without delay; but the finance people do not want to lock too much money up in inventories of finished products; and the production men want to keep costs down by avoiding frequent changes in production. It is in finding the right balance between all these different legitimate interests that the quality of management shows itself.

The Financial Aspect of Project Appraisal

Now I come to the sixth and last aspect of project appraisal - the financial aspect. Here I am most aware that what I shall say to you is inadequate, but all I can do is to indicate what sort of subjects the investigation should cover, and emphasize certain problems to which our experience has taught us to pay particular attention. Just as everything that we have mentioned so far has its material and human side, so also it has its financial side - it either costs money or brings in money. Here again it is useful to speak separately about the financial problems relating to the construction phase and those concerned with the operating stage.

But before we consider the construction stage it is necessary to say a few words about the pre-construction stage. By this I mean that when one is dealing with an existing organization with a past history of operations, one has first to analyze the financial results of past operations and the present financial situation. In this stage of the investigation what I said at the beginning of my talk applies with particular force - that is that it is not prudent to take anything for granted. One is faced with tables of figures - balance sheets, profit and loss accounts, and other kinds of financial statement. Every figure must be examined with a critical eye. Is the figure at which fixed assets are valued in the books a realistic one? Are the receivables over-due? Do the inventory figures include a lot of finished goods that cannot be sold? What are the terms of existing debt? Has a sound depreciation policy been followed? How much of the profits have been paid out as dividends, and how much retained in the business and reinvested? Has the business suffered from a shortage of working capital? Have the profits which have been earned included some "windfall" profits from the appreciation in value of inventories? Are the inventories conservatively valued? Are there any contingent liabilities that do not appear in the financial statements?

You will see by these questions what I meant when I said the investigator must be a cynic - if he takes anything at its face value, then he ought to be in another profession.

The Construction Period

How Much Money is Needed, and When?

The first thing one has to do here is to satisfy himself how much money is needed to construct the project and get it operating. This is not quite as easy as it sounds. One starts, of course, with the estimates of cost which one's engineering colleague has already scrutinized; but this is only the start. Often that is not the only money that will be needed by an organization during the construction period. During this period it may be necessary to repay existing debts. It may be necessary to stockpile raw materials before the construction is completed. It may be necessary to make provision for interest during construction. It will be necessary to earmark a sufficient fund to take care of contingencies. Taking all

these into account, one arrives at a certain amount of money which will be needed during the construction period. It is not enough, though, only to know how much will be needed; one also needs to know when it will be needed. And so the final result of this phase of the investigation is a budget for the whole of the construction period, showing for each main element of the project, and also for other purposes, how much money is needed and when it is needed.

Estimating Working Capital Needs

I must at this point return to the question of working capital, which is one of the things about which our experience has taught us to be particularly careful. The amount of working capital which is needed for the successful operation of a project depends on various factors, each of which can be estimated with some degree of accuracy. It depends, for instance, on the volume of production; on the length of the productive process; the length of the pipeline of production. It depends on where you are getting your raw materials from. If you get them from a source thousands of miles away, from which they are shipped in large quantities at relatively long intervals, it will be always prudent and at certain times unavoidable, to keep more money locked up in stores of raw materials than if you get them from a source the other side of the road.

The amount of working capital needed depends on the terms on which you buy, the amounts of credit you can count on receiving from your suppliers. It also depends on the terms on which you sell, the amount of receivables which you have to finance.

All these things have to be taken into account in calculating the amount of working capital that is likely to be needed by an organization.

There is a further problem that has to be taken into account. Working capital is a fluid, dynamic concept, and every business has to keep a certain amount in cash or in the bank, just to meet the swings in its cash position which arise from the fact that the flow of receipts does not match the flow of payments in timing.

Finally, in some kinds of industry the requirements of working capital vary, and sometimes vary very considerably, from season to season during the year. Some factories, for instance concerned with processing agricultural products, may have a short production season and a long selling season; others, for instance a fertilizer factory, may continue production at a steady rate throughout the year, but their sales may be concentrated within a few months.

The financial investigator has also to make sure that satisfactory arrangements have been made to meet these fluctuations in working capital requirements.

The Sources of Finance

After the requirements for finance have been estimated, the next thing is to see from what sources it is proposed that these requirements be met. It is not enough to ascertain that the total amount provided fully covers the needs; it must be available when it is wanted. So the investigator has to make sure that money will be made available either before or at the time when it is needed.

The next step is to find out the terms on which the money is planned to be provided, and to judge whether they are suitable. I believe there are instances in Taiwan where people have borrowed at short term to cover the costs of fixed assets, and very shortly found that they were in financial difficulties when they were faced with the obligation to repay the loan. That is, of course, unsound financing. One must be careful to make sure that the revenues which may be expected from the project will be more than adequate to pay interest on debt and to meet the repayment instalments when they fall due. To estimate the repayment capacity of the project one has of course to make a forecast of the probable revenues and expenses. Now in making this kind of forecast one has not only to estimate what would be the financial results of a normal year of operations; one has also to estimate the result of a bad year, because every kind of project meets a bad year now and then, and one must be able to meet a bad year without getting into financial difficulties.

There is one other thing one has to consider in making forecasts of earnings. One must make allowance for the difficulties and expenses which may be encountered in the process of preparing to go into operation, and in the initial stages of operation. Often the promoters of projects are much too optimistic about these difficulties and expenses.

The Assumptions for Forecasts

I would add here that no forecast can ever, except by an extraordinary accident, be more reliable than the assumptions on which it is based. So in making forecasts, and in evaluating forecasts made by others, it is always a very useful practice to list all the assumptions which are at the basis of the calculations, and always to bear in mind the degree of margin of error contained by these assumptions.

The Operating Period

I have already mentioned the need to forecast the financial results which may be expected during the operating period. Among other things it is often necessary to calculate what is called the break-even point. This term - the break-even point - is understood in at least two different ways. Sometimes it is interpreted to mean the point to which production and sales could be reduced without actually incurring a loss; and sometimes the point at which they must be maintained if all fixed financial obligations are to be met punctually. Finally, it is necessary to make a forecast of what is called the cash flow, in order to make sure that the working capital may not be run down to a dangerously low point.

Conditions for Lending

It is only after all these calculations have been made and studied that the investigator is finally in a position to make a judgement about the soundness of the proposed financing plan, and to conclude on what conditions loan money should be made available for the project. It may be necessary, for instance, to limit the freedom to incur further debt, or the freedom to embark on further projects except in accordance with an approved financial plan. It may be necessary to restrict the power to pay dividends, in order to conserve an adequate amount of working capital.

Well, I am becoming more and more aware of how inadequately I have treated many of these complex questions, but I must now come to the end of what I have to say about project appraisal.

Let me sum up this part of my talk. In appraising projects, one has to look at them from six different points of view (economic, technical, managerial, organizational, commercial and financial). It needs different kinds of knowledge and experience to examine each of these aspects, which can generally be obtained by combining the work of economists, engineers and financial analysts. But in the last analysis, all these different points of view have to be brought together into a single judgement about the merits of the project. That is why in the beginning I said that this work of appraisal has to be approached from the broad point of view of management, which uses specialists in various fields as its servants and not as its masters.

The Supervision of Projects

I now come to the second subject of my talk this afternoon - the supervision of projects. It is in exercising this function that one discovers what mistakes one has made, what things one has left out of account, in the process of appraisal.

The Task in General

In the process of appraising the project, the investigator in effect sets up a number of targets, both physical and financial. He estimates that the project will take a certain amount of time to complete, and that a certain amount of money will be necessary to complete it; he estimates that the cost of production or operation will be so much that the project will be able to produce a particular amount of goods or services, and (if appropriate) that it will be able to sell these goods and services at a price which will result in a sound financial condition and a certain level of return on the capital invested. All these forecasts are the result of judgement; time will show whether that judgement was good or faulty. The task of supervision consists in learning whether actual progress of the project corresponds to the various targets which have been set up, and in discovering and if possible curing - or even better, in foreseeing and if possible avoiding - possible difficulties which may stand in the way of the punctual achievement of the targets.

General Procedures

One can exercise the function of supervision in different ways. The first is to station a man at the site of the project who will himself act as your eyes and ears and report to you what he learns. This is an expensive way, and has certain drawbacks, because there is a real danger that this man will be drawn into the actual management of the project. Supervision does not mean management; it means "watching from above."

Another way is to require the submission of reports on progress from those who are responsible for carrying the project out, and relying simply on these reports for information. This also has its risks. People may not wish to report bad news, and they may be too optimistic about their ability to overcome difficulties.

As the result of our experience in the World Bank, we have come to the conclusion, on which our practice is based, that the best way of carrying out the function of supervision is to require the submission of regular progress reports, and to supplement our knowledge of the progress of the projects by sending our own men out to visit them from time to time. In this way there is a continuity of working relationships, which were established during the appraisal, and carried forward during the construction and operating stage of the project.

The Construction Period

In this period the reports are designed to show how the actual progress made (both physical and financial) compares with the targets set up in the construction schedule and the budget, to draw attention to any delays and difficulties and to the measures taken or proposed to cure the delays and solve the difficulties. It is our experience that in this stage it is not so useful to be told that the project as a whole is 47% or 53% completed; a project may be 99% completed, but if the remaining 1% is vital, then the whole project is held up. To our way of thinking, it is much more significant to know if progress is three weeks ahead of schedule or five weeks behind schedule, and to know whether any delays can be made good without postponing the final completion date. Delay costs money in two ways; it increases the cost of completing the project, and it postpones the day when the project begins to generate a return on the investment made in it.

Control of Expenditures

It is necessary to exercise some control, during the construction period, over expenditures. Unless this is done, the kind of unfortunate development may occur which caused many problems to one of the local development banks I know of in another country. Some of their borrowers, during the construction period, used the money which was originally earmarked as working capital to buy extra machinery. As a result, when their projects were completed, they found themselves without working capital and in a very difficult financial position.

Revision of Estimates

One of the things that has to be watched in this period is the revision of estimates. As time goes on, it may be necessary to make amendments in the construction schedule and in the budget. If these are not made, or if the revision is left too long, unpleasant surprises may be in store for all concerned. In most big projects, both the construction schedule and the budget for the remainder of the construction period should be completely reviewed and revised at least once a year. The interval should of course be shorter, if the construction is not so long.

Reports Should be Prompt, and Look Forward

In general, it is better to receive an incomplete report promptly, than to wait a long while for a report which is most beautiful and complete, but quite useless because it is out of date. Also, in general, reports should not be made indigestible by containing a lot of unnecessary detail; they should be as short as is consistent with their giving all the essential information. It is of course no use insisting on the prompt submission of reports unless they are reviewed, and any necessary action taken, without any delay at the receiving end.

The Operating Period

This is of course when the real test of the project comes, and the reports will be of a quite different character during this period. They will be concerned with production, cost of production, sales and proceeds of sales, with the general financial or economic results of the project and with difficulties encountered in the operation of the project.

This is really as much as I have to say to you, and I would close my speech by reminding you that we in the World Bank and the International Development Association make no claim to know the last word about appraisal and supervision. We are ourselves learning all the time, and I may say that from this point of view our stay in Taiwan has been exceedingly profitable. We have all learned a number of things in the last three weeks that we did not properly appreciate before.

I thank you for the close attention with which you have listened to what I had to say, and apologize if I have disappointed you by not dealing fully with the particular aspects of appraisal and supervision in which some of you are particularly interested.

Appraisal of projects (Ripman's paper on March 1961)

Economic aspects:

In any country, infrastructure first (transportation, power) Then agriculture → then light industry → then heavy industry
Subsidies and protection: justified only to protect "infant" industry.
Relative scarcity of production factors: labor intensive versus capital intensive processes for using idle natural resources of country rather than imported raw materials.
Effects on balance of payments, timing of projects.

Technical Aspects:

Scale of operations: ∃ minimum scales of operations.
Plan lay-out and location: leave space for further expansion.
Location is important: near raw material or near labor market.
Consultants
Cost estimates of construction and operations: be on pessimistic side. Do not forget the working capital

Management aspects:

- Danger of one-man successful management. Train local labor when hiring management from abroad.

Organizational aspects:

Construction stage: consultants if necessary.
Operating stage: when scale of operations ↗, more specialization and decision decentralization is needed. Use of units will ↗.
Create internal efficient information circuits to management and controls.
Budgetary control, inventories control necessary.
Importance of preventive maintenance. Training also.

Commercial aspects:

Open competitive bidding. Suppliers' credit is often expensive.
Importance of working capital.

Financial aspects:

- Here, most important is not to take anything for granted.
- Determination of needed working capital is crucial.