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Romania: Appraisal of the Brasov Bearings Project

(In Two Volumes)

Volume I: The Main Report

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Industrial Projects Department

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CURRENCY EQUIVALENTS

Except where otherwise indicated, all figures are quoted in Romanian Lei and US Dollars. For all calculations, the following conversion rate has been used:

US$1	=	Lei 20
Lei 1	=	US$0.05
Lei 1,000	=	US$50.00

WEIGHTS AND MEASURES

All units are metric.

1 metric ton	=	1,000 kilograms (kg)
1 metric ton	=	2,204.6 pounds
1 kilometer (km)	=	0.62 miles
1 meter (m)	=	39.3 inches
1 cubic meter (m^3)	=	35.32 cubic feet

ABBREVIATIONS AND ACRONYMS

IB	- Banca de Investitii (Investment Bank)
NB	- Banca Nationala a Republicii Socialiste Romania (National Bank)
CIROA, the Central	- Industrial Central for Bearings and Assembly Components
The Enterprise, Brasov	- Brasov Bearings Enterprise
The Design Center	- Design and Research Center for Bearings and Fasteners
The Central Design Institute	- Ministry of Machine Building Central Institute for Machine Tool Design
TECHNOEXPORTIMPORT	- Technoexportimport Foreign Trade Enterprise
UZINEXPORTIMPORT	- Uzinexportimport Foreign Trade Enterprise
OCIR	- Central Organization for Bearing Producers and Consumers
OEM	- Original Equipment Manufacturers

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APPRAISAL OF THE BRASOV BEARINGS PROJECT

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This report has been prepared by Messrs. Kohli, O'Neil and Sinha of the Industrial Projects Department and Mr. Davey (consultant) based on missions to Romania in November 1975 and May and November 1976.

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ROMANIA

APPRAISAL OF THE BRASOV BEARINGS PROJECT

SUMMARY AND CONCLUSIONS

i. This report appraises the expansion and modernization project of the Brasov Bearings Enterprise, Romania's largest and oldest bearings producer, which will increase production from 20.0 million bearings in 1976 to 33.5 million in 1985, expand its product mix and substantially improve product quality. The total cost of the project is estimated at Lei 1,755 million (US$88 million), including Lei 760 million (US$38 million) in direct and indirect foreign exchange costs.

ii. Since the inception of the Brasov plant in 1949, the Romanian bearings industry has made rapid progress. In 1975, four domestic plants produced about 71 million bearings valued at approximately Lei 1.9 billion (US$95 million), of which nearly one-third were exported. Substantial changes have taken place in the industry since the late 1960's, when the Government invited Koyo Seiko, a major bearings manufacturer in Japan, to help establish large modern production facilities at Birlad and Alexandria. This was part of a major expansion and rationalization program designed to improve industry efficiency by introducing the latest production processes and increasing product specialization among different plants. After the completion of Brasov's proposed expansion and modernization, the basic objectives of this rationalization program will have been achieved.

iii. Overall, the Romanian economy -- particularly the industrial sector, which is the main consumer of bearings -- has been growing at a very high rate. As a result, consumption of bearings in Romania over the last 25 years has increased from 0.4 million pieces in 1950 to 46.6 million in 1975, representing an annual growth rate of 20%; though, since the early 1960s, growth has slowed somewhat to an average of between 12-15%. Demand for bearings in Romania is likely to continue expanding rapidly in the foreseeable future, though somewhat slower than in the recent past due to the lower growth rates planned for the major consuming sectors during 1976-80. It is estimated that domestic consumption will reach 65 million pieces in 1980 and 85 million in 1985. In addition to meeting a major portion of this domestic demand, the industry is also planning to continue exporting. Exports are expected to reach 63 million pieces in 1985 (43% of total production) compared to the 35 million (47%) estimated for 1976. The increased domestic production would also help reduce the imports of special bearings from about 6.4 million pieces in 1975 to 4.0 million in 1985.

iv. A major part of exports would be under medium- to long-term sales contracts with international bearings manufacturers and centrally planned economies. However, to meet its ambitious export targets, the industry will also have to substantially increase its own direct sales in market-oriented economies. Due to the present lower product quality and lack of appropriate marketing organization and customer service, Romanian bearings are currently

being sold in these markets at prices often substantially below those obtained by other established international bearings manufacturers. As product quality improves and Romanian bearings become better known to major consumers, the export prices realized are expected to increase. However, it is also apparent that the above export targets can be achieved at profitable prices only if the marketing arrangements abroad are strengthened. The Romanian authorities have recently become aware of the need to improve the export marketing organization, and if this is indeed done as contemplated, the projected export sales to market economies are expected to be realized.

v. The Brasov Enterprise produces the largest mix of bearings amongst Romanian producers. In 1976, it had planned to produce 28 million 1/ bearings, of which 21.7 million (78%) were expected to be sold locally to supply 40% of total domestic market needs. By 1984, Brasov plans to nearly double its output to 53 million bearings, including some sizes and types currently not produced locally. In that year, Brasov expects to place 75% of total sales domestically and export the balance, including 7.7 million pieces (14% of total sales) in Bank member countries. These sales targets are considered realistic, provided the anticipated improvements in the export marketing organization are carried out.

vi. Like all other productive assets in the country, Brasov Enterprise is owned by the State and has limited autonomy and decision-making responsibilities outside production. It belongs to the Ministry of Machine Building and is under the control of the Industrial Central for Bearings and Assembly Components. Brasov's performance in recent years has been satisfactory and its management group is considered capable of effectively running the Enterprise under the Romanian system.

vii. The proposed project, designed to increase production capacity as well as to manufacture a wider range of bearings of significantly improved quality, consists of two distinct and technically separable components: (a) erection of one new, fully automated high volume production line (the Hi-Volume Component) with an annual capacity of 5.5 million bearings; and (b) modernization and expansion of low volume facilities (the Low-Volume Component) to reach a final capacity of 28.0 million pieces. An important feature of the latter component is to increase the production of tapered roller bearings from 2.6 million to 14.0 million pieces. Not part of the Bank financed project is the contemplated expansion of the production of needle, cardan and special bearings, which is being implemented and financed with assistance from Koyo Seiko.

viii. The Bank has worked closely with the Romanian authorities in the formulation and improvement of the project scope and design. Since the submission of the original project proposal in the fall of 1975, important changes, aimed at improving the project's economic viability, have been made in the product mix, timing, market orientation, and export marketing arrangements. The Government has also agreed to create an industrial engineering

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1/ Including needle and cardan bearings produced at facilities separate from project components.

group at Brasov to review the possibilities of further improving the project's product mix, labor productivity and working capital requirements, and to identify on a continuous basis opportunities to further enhance the efficiency of Brasov's operation.

ix. Physical implementation of the project started in January 1977 and will be completed in December 1981, though some Low-Volume component facilities would start production in the second half of 1979. The Brasov Enterprise will have the primary responsibility for project design, engineering and implementation, and has on its staff personnel with prior experience in executing similar projects. Buildings, civil works and erection will be handled by the Enterprise for Erection of Special Industrial Buildings, as it did for the new bearings plants at Alexandria and Birlad.

x. Total financing required for the project, including interest during construction, is estimated at Lei 1,861 million (US$93 million). The proposed Bank loan of US$38 million would cover the estimated total foreign exchange cost of the project. The remaining financing would be provided by the Government of Romania in the form of equity. The Bank loan is proposed to be extended to the Investment Bank. As in the case of other Bank projects in Romania, the Investment Bank would pass on the loan proceeds to the Enterprise as state funds. However, annual depreciation and benefit remittances will have to be sufficient to equal notional payments of a 10% interest rate and principal on the Bank loan to the Investment Bank.

xi. Due to the severe foreign exchange shortage in the country, the Romanian authorities have set a value limit on direct imports from Bank member countries to be permitted for the project of approximately US$26 million as compared to the Bank's estimate of about US$31.5 million. To ensure that the project remains technically acceptable and is executed along the lines presented to the Bank, two complementary agreements obtained are critical: (a) the equipment and division of sources of supply between local and imported equipment as approved by the Government and agreed with the Bank would remain essentially unchanged unless otherwise agreed to by the Bank; and (b) the Government would permit imports above the value limit set by it in case it becomes technically necessary in line with the assurance under (a) above. However, should, contrary to current Bank expectations, the cost of agreed imports be lower than the US$31.5 million being made available under the Bank loan, a part of the loan equivalent to the resultant reduction in the total foreign exchange cost of the project, will be cancelled.

xii. The Bank loan would finance foreign currency cost of imported equipment, spares and services estimated to cost US$31.5 million, on which only foreign suppliers are expected to bid, and other equipment and machinery totalling US$6.5 million, on which both foreign and Romanian suppliers are likely to bid. Goods to be financed by the Bank will be procured under some 30 bid packages through international competitive bidding in conformity with Bank guidelines.

xiii. The financial situation of the Enterprise is projected to remain satisfactory during and after project implementation, though under the

Romanian financial system the financial position of an enterprise is neither a true measure of its performance nor a factor in determining its viability. The economic return of the project is calculated at 14.0%, composed of an 18.9% return for the Hi-Volume Component and 11.2% for the Low-Volume Component. The project would annually save about US$49 million in foreign exchange, create some 500 new jobs, and also accrue substantial additional revenues to the national budget through depreciation and benefit remittances. It would significantly improve the quality of Romanian bearings, which in turn would help improve the quality and competitiveness of a wide range of industrial products manufactured for domestic and export markets. Finally, the project would make Romania more self-sufficient in bearings and introduce up-to-date technology in a critical industry.

xiv. The risks associated with the project, which are considered moderate and acceptable, are basically two-fold. First, as part of the national policy, the project is expected to use some local equipment and components not currently produced domestically. While most critical equipment is ear-marked for imports, there is always a modest risk that any equipment purchased from a relatively new producer may present some initial teething problems. Second, actual export volume (or prices) to market-oriented economies may be lower than projected. However, since such sales are planned to be less than 15% of the total by volume (and even less by value) and because domestic market forecasts are considered conservative, the market risk is moderate.

xv. With the agreements and commitments obtained from the Government and the Investment Bank, the project is considered suitable for a Bank loan of US$38.0 million equivalent to the Investment Bank for a period of 13 years, including 3 years of grace, at 8.2% interest.

I. INTRODUCTION

1.01 This report appraises the expansion and modernization project of Brasov Bearings Enterprise (the Enterprise), the oldest and largest bearings manufacturer in Romania and the seat of the Industrial Central for Bearings and Assembly Components (CIROA). The plant is located at Brasov, the country's fifth largest city, about 200 kilometers north of Bucharest (Map). The proposed project is designed to (a) increase capacity from 20.0 million bearings in 1976 to 33.5 million bearings in 1982 1/; (b) introduce up-to-date technology and modernize existing facilities; (c) expand the product mix; and (d) substantially improve product quality.

1.02 The project is part of the Government's overall development strategy to promote rapid expansion of domestic industry based on advanced technology and to minimize reliance on imports of critical products needed by the industrial sector. It would also allow the share of bearings exports to total production to remain at about the present level and earn critically needed foreign exchange. The total cost of the project is estimated at Lei 1,755 million (US$88 million), including Lei 760 million (US$38 million) in foreign exchange costs. The proposed Bank loan would be US$38 million, equivalent to the total foreign exchange cost of the project.

1.03 The project was identified in April 1975 by an industrial sector mission, and preappraised in December 1975, when the need to make certain modifications in the project scope, to improve its economic viability, became apparent. The Government presented a modified project, which substantially reduced the market risks, to the appraisal mission - comprising of Messrs. Kohli (Chief), O'Neil and Sinha of the Industrial Projects Department and Mr. Davey (consultant) - which visited Romania in April/May 1976. At the Bank's suggestion, the Government agreed to review the possibilities of further improving the project design to make the proposed investment economically more attractive. These changes were reviewed by the Bank in the field in November 1976 and in Washington in March 1977.

1.04 A brief description of bearings industry technical terms, as well as explanatory sketches of the principal types of bearings, are given in Annex 1.

II. BEARINGS INDUSTRY AND ORGANIZATION

A. Brief Historical Background

2.01 Romania enjoys some important advantages that have favored the development of a domestic bearings industry. First, the country has a large number of disciplined, well-trained and skilled workers available at a fraction of

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1/ Aside from this project, another section of the plant, technically and physically separate from the project, is also expected to increase the capacity of needle, cardan and special bearings from 10.5 to 19.5 million units, making the total plant capacity 53 million units in 1985.

the wages paid in developed countries, a crucial advantage in this formerly labor-intensive industry. Second, even though bearings are a precision product, the industry, until recently, used relatively simple and easily available machine tools. Third, in recent years the Romanian domestic market has been large enough to support volume production of selected bearings. And finally, due to the very large variety of products involved in this industry, inventory and/or production costs can be reduced to some extent if certainty of demand and supply can be assured, which the Romanian system of centralized planning can generally do. Thus, the country is well-placed to develop a competitive bearings industry, if the plants are properly designed and operated (para. 9.05).

2.02 The Romanian bearings industry started in 1949 and has made rapid progress. In 1975, it supplied about 86% of domestic bearings needs (47 million pieces), while also exporting 22 million bearings (31% of production) from four bearings plants; total domestic production totalled 71 million bearings valued at approximately Lei 1,900 million (US$95 million). This would make CIROA, the Central which controls all four bearings enterprises (Brasov, Birlad, Alexandria and Ploiesti; Map IBRD 12361), one of the fifteen largest bearings producing companies in the world. The growth in the domestic production is summarized below:

Romania: Buildup of Domestic Bearings Production, 1950-1976
(Million Pieces)

	1950	1955	1960	1965	1970	1975	1976 (estimate)
Brasov	0.2	1.1	3.2	11.0	20.8	28.5	27.8
Birlad	-	0.6	1.3	2.5	3.7	25.4	25.8
Alexandria	-	-	-	-	-	16.8	20.8
Ploiesti	-	-	-	-	NA/a	NA/a	NA/a
Total	0.2	1.7	4.5	13.5	24.5	70.7	74.4

/a Ploiesti annually produces large bearings totalling approx. 1,500 tons.

2.03 Initially, bearings were produced on a relatively small scale and with know-how largely developed in Romania. However, in the late 1960s the Government invited Koyo Seiko of Japan to help establish large modern production facilities at Birlad and Alexandria, which were commissioned in 1974. Similarly, in 1975 an agreement was signed with Rollway Bearings of the US for the production of large-sized bearings at Ploiesti. Finally, in early 1977, Brasov reached an agreement with Koyo Seiko for the supply of the advanced technology needed to produce needle and special bearings not yet manufactured locally. This policy of combining locally developed skills with foreign know-how and technology, wherever critically needed, is expected to provide also in future the necessary technological base for this fast expanding industry in Romania. A brief history of the Romanian bearing industry and its organization is given in Annex 2-1.

B. Industry Rationalization Program

2.04 Major changes took place in the bearings industry during the 1971-75 Plan period and are continuing. Not only were two major and modern new facilities commissioned (Alexandria and Birlad), but the industry also launched a major production rationalization program to improve efficiency by (a) producing on new automated facilities large-volume bearings which were earlier produced by less efficient low-volume production techniques; (b) eliminating manufacture of most variations of the same basic bearings, and thus streamlining production processes; and (c) increasing specialization of different plants by type (groups) of bearings. A brief description of the production processes used by the industry, and the changes being introduced, is given in Annex 2-2.

2.05 The basic concepts behind the rationalization program are in line with the recent trends in the bearings industry elsewhere. Increased specialization in production is generally considered as the key to achieving lower production costs and higher plant and labor productivity in bearings plants. With the proposed expansion and modernization of the Brasov plant and the opening of the new Ploiesti plant, most of the objectives of the rationalization program would have been achieved by 1982. But the full potential benefits of this program in terms of lower costs can be attained only after a review of Brasov's proposed product mix (para. 5.08).

C. Organization of Bearings Industry

2.06 Like most other productive assets in the Romanian economy, the bearings industry is owned and managed by the State, which sets specific production and other targets and makes available the necessary resources to meet such targets. 1/ The organization structure of the industry, depicted in Annex 2-3, has a three step hierarchy consisting of the Technical Ministries (nine in all) at the top, Industrial Centrals in the middle and the Enterprises at the bottom. The bearings industry belongs to the Ministry of Machine Building Industries, which - through 10 Centrals - controls about 150 enterprises that produce automobiles, trucks, earthmoving machinery, machine-tools, power generating equipment, and other heavy machinery in addition to engineering goods like bearings. The Ministry is responsible for the overall performance of the sub-sector, coordinates its activities with other parts of the economy, translates overall national economic objectives into specific financial and physical targets for individual industries, and approves specific investments.

2.07 Under the Vice Minister responsible for the planning and execution of new projects in the Ministry, are the Central Design Institute and the Construction Trusts 2/ responsible respectively for engineering and construction. However, unlike most other cases, the Ministry of Machine Building does not have under

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1/ See also Bank Report No. 492A-RO "Planning and the Planning System in Romania", dated October 11, 1974.

2/ Although, technically, all construction trusts belong to the Ministry of Industrial Constructors.

its control the export and import of bearings; this function is exclusively handled by the TECHNOEXPORTIMPORT Enterprise, which belongs to the Ministry of Foreign Trade. This organizational separation of the foreign trade responsibilities from other aspects of the bearings industry is under review by the Romanian authorities (para. 4.23).

2.08 CIROA, the Central, is responsible for the production and domestic distribution of bearings and industrial fasteners. Under its jurisdiction, there are the four plants engaged in the production of bearings (para 2.02); five plants producing industrial fasteners; an enterprise responsible for domestic sales and distribution; and the Design and Research Center for Bearings and Fasteners. CIROA's basic role is in the planning area. It acts as a conduit between the Ministry and the enterprises and is responsible for coordination, preparation and monitoring of annual and five-year financial and production plans in the sub-sector. The General Managers of all enterprises report to CIROA's General Director, who chairs the executive committee of the Central composed of worker representatives and managers of the enterprises.

III. THE ENTERPRISE

A. Plant Facilities

3.01 Since its inception in 1949, Brasov has remained the largest bearings producer in Romania. After the plant was designated as Brasov Bearings Enterprise in 1959, its production increased rapidly from 3.2 million pieces in 1960 to 28.5 million in 1975. The plant produces the largest mix of bearings amongst Romanian plants, including: (a) single row radial ball bearings; (b) double row radial axial and self-aligning ball bearings; (c) tapered roller bearings; (d) needle and cardan bearings; (e) plain bearings; and (f) other special bearings. Brasov sells part of its ball production and some forgings to the Birlad plant and is also responsible for producing certain specialized equipment needed by the Romanian bearings industry.

B. Organization and Management

3.02 The Enterprise, like other industrial enterprises in Romania, is primarily a production-oriented organization with only limited autonomy and decision-making responsibilities outside production. While it has its own production plans (based on targets set by the Plan), prepares separate financial statements, and can borrow money from designated banks, any substantive changes in its organizational structure, investment programs, production targets, or in product mix must be approved by the Council of Ministers.

3.03 The Enterprise's organization structure is shown in Annex 3-1; it is adequate under Romanian conditions for fulfilling production functions. Technically, the ultimate decision-making power lies with the Workers' General Assembly, which normally meets twice a year to examine the operating results and review the performance of the Working People's Executive Committee. This

Executive Committee, consisting of elected representatives of workers and also some key members of the management, is chaired by the General Director of the Enterprise who is normally appointed by the Minister of Machine Building. The General Director is responsible for the day-to-day operations and implementation of the decisions taken by the Executive Committee, through a team of key managers, such as for production and other technical matters, sales and procurement, as well as finance and accounting.

3.04 The Enterprise is well managed. The General Director has delegated most of the day-to-day operational responsibilities to the Technical Director, a dynamic and capable manager, who has been associated with the industry in various senior positions for more than 25 years. He is well versed in the technical developments in the industry outside Romania and is supported by a group of experienced and dedicated engineers. The management group is considered capable of effectively running the Enterprise under the Romanian system.

C. Romanian Financial System

3.05 The conventional financial analysis applied by the Bank to evaluate the performance of commercial organizations is of limited significance in the case of Romanian enterprises, which draw up their annual financial plans to meet the specified targets allocated to them; together these make up the so-called National Financial Plan. The National Financial Plan and the State Budget are submitted to the Council of Ministers for approval and then to the Grand National Assembly; after its approval they become law. The State also determines all prices. Therefore, as noted above, since the primary responsibility of Romanian enterprises is to meet the physical production targets set for them by higher authorities and make optimum use of resources provided to them and since the product mix and prices of all inputs and outputs are predetermined, the financial profitability neither fully reflects an enterprise's efficiency nor is an important factor in investment decisions (see also Bank report No. 459-RO" Appraisal of Tecuci Fertilizer Project", dated May 21, 1974). The following financial analysis of the Enterprise should be viewed in this context.

D. Financial Performance - Brasov Enterprise

3.06 The Enterprise's performance in the recent past has been satisfactory. Detailed financial statements are presented in Annexes 3-2, 3-3 and 3-4 and summarized below.

Brasov Enterprise: Summary of Financial Statements 1971-1976
(In Million Lei)

Year Ending December 31	1971	1972	1973	1974	1975	1976 (Estimate)
Production (million units)	21.1	24.0	25.9	28.0	28.4	27.8
Sales Value of Production	631.7	739.3	798.7	842.5/a	853.0/a	1,103.0
Operating Expenses	529.7	589.3	616.2	690.0	760.4	940.4
Benefits (Profit before Tax)	102.0	150.0	182.5	152.5/a	92.6/a	162.6/a
Benefits as % of Sales	16.1%	20.3%	22.8%	18.1%	10.9%	14.7%
Working Capital	150.1	156.3	176.9	213.9	215.5	458.9
Gross Fixed Assets	991.5	1,125.9	1,231.8	1,325.7	1,356.2	1,600.6
Projects Under Construction	124.2	286.5	44.3	60.6	141.5	-
Total Assets	960.2	1,188.6	1,064.0	1,156.0	1,347.0	1,413.0
State Funds for Investment	635.5	702.4	762.0	793.9	835.2	901.2

/a In mid-1974 the production price of bearings was temporarily reduced. It was again raised in Jan. 1976, about 15% above the pre-1974 level.

3.07 During the 1971-75 Plan period, the Enterprise's sales value increased by 32% and sales volume by 35%, while net profits (benefits) as a percentage of sales declined from 16.1% to 10.9%. However, this decline in financial profitability is due mainly to the Government's decision in mid-1974 to temporarily reduce the price of bearings by an average of 14.4% (para. 4.16). In case mid-1974 prices were still in effect, 1975 revenues would have been Lei 940 million (instead of Lei 853 million) and benefits 19.1% of sales (instead of 10.9%).

3.08 Brasov has a satisfactory financial structure considering the special characteristics of Romanian investment practices and the cash flow system. Like most Romanian enterprises, Brasov has incurred practically no long-term debt in recent years except for some medium-term credits extended by the Investment Bank for the financing of equipment for projects under construction. These credits are paid off, through the infusion of equivalent equity funds (State advances), as the plant is commissioned. As a result, at the end of 1975, Brasov had no long-term debt outstanding and "equity" accounted for about 78% of total assets.

E. Investment Bank - The Borrower

3.09 The Investment Bank (IB) administers and controls all investment funds of the State Budget (except for agriculture and food processing) and acts as the channel for all sources of major domestic investment financing in industry. Recently, IB has also started to make credits on its own, though

funds available for this purpose are still relatively small. The President of IB reports directly to the Minister of Finance who has comprehensive authority in the planning and financing of all projects.

3.10 The IB has wide-ranging responsibilities in the implementation of projects and plays an important role in project evaluation, procurement and execution. For all projects, IB reviews the techno-economic study before submission to the Council of Ministers for formal approval, and later ensures that the projects are executed accordingly. In the case of the proposed project, IB will review, with the assistance of Brasov and UZINEXPORTIMPORT, all orders for equipment before they are placed, will comment on any contract changes, and can impose penalties on defaulting parties. During the operational phase of the project, IB's functions are limited to checking whether the enterprise is meeting the targets set in the Investment Plan. IB has no legal authority to bring its views to bear directly on the management of an enterprise. In practice, however, IB can recommend necessary operational actions to the Ministry of Finance, which, in turn, can act through the ministry concerned with the project. As in case of previous Bank loans to it, the Investment Bank has agreed to submit its properly audited financial reports to the Bank in an agreed form and within agreed dates.

IV. MARKET AND MARKETING

4.01 In 1975, about 79% of Brasov's production was marketed in Romania and the balance exported to some 50 centrally planned economies and Bank member countries. After project completion, in 1985 about 75% of its production will be sold domestically and the balance 25% exported, including about 10% to COMECON countries as part of long term bilateral trade agreements. The recent developments and future prospects of the Romanian bearings industry's main markets are discussed in Annex 4-1 (domestic market) and Annex 4-2 (export markets). This chapter first discusses the overall domestic and export markets for Romanian bearings and then reviews Brasov's role and plans in these markets.

A. Domestic Romanian Market - Recent Consumption and Production

4.02 Consumption of bearings in Romania over the last 25 years increased from 0.44 million pieces in 1950 to 46.6 million pieces in 1975, representing an average annual growth rate of 20%. While consumption growth has slowed down somewhat since the early 1960's, it has still been averaging about 12-15% annually with only relatively minor fluctuations over the past fifteen years. Historically, over a third of bearings consumed locally had to be imported. However, with the commissioning of the major new production facilities at Birlad and Alexandria (paras. 2.02-2.03) in 1973 and 1974, domestic production has increased faster than consumption; this has not only made Romania more self-sufficient in bearings but also allowed it to more than triple exports, as shown in the table below:

Romania: Bearings Market 1950 - 75
(Millions of Pieces)

	1950	1955	1960	1965	1970	1971	1972	1973	1974	1975
Total Domestic Market	0.4	2.1	6.5	13.1	25.6	28.4	34.2	37.7	42.7	46.6
Domestic Production	0.2	1.7	4.5	13.5	24.5	26.1	28.3	31.1	50.2	70.7
Imports	0.5	0.7	3.0	4.8	9.1	11.6	13.8	14.6	10.1	6.4
Exports	-	-	0.3	4.5	7.4	6.8	7.1	7.3	13.9	21.6
Imports/Domestic Consump.	68%	31%	46%	37%	36%	41%	40%	39%	24%	14%
Exports/Domestic Prod.	-	-	7%	33%	30%	26%	25%	23%	28%	31%

4.03 The Romanian economy overall and, in particular, the industrial sector which is the main consumer of bearings, have recently shown a very high growth rate. The past development of demand for bearings by major consumers is detailed in Annex 4-1 and the following table compares the sectoral growth rate during 1950-75 with bearings consumption.

Romania: Annual Growth Rate of Production in Major Bearing Consuming Sectors 1950 - 1975

	1950-55	1955-60	1960-65	1965-70	1970-75	1950-75
Transp. incl. Tractors	39.0%	3.9%	6.8%	13.1%	12.0%	14.4%
Equip. & Machine Tools	NA	53.0%	11.2%	8.7%	14.4%	16.1%
Electrical Equip.	12.9%	26.1%	19.2%	18.2%	14.1%	17.3%
National Economy	14.0%	7.0%	9.0%	7.7%	11.3%	9.7%
Bearings Consumption	37.0%	23.0%	15.6%	13.2%	12.7%	20.5%

4.04 The primary industrial bearings consumers in Romania, as in other countries, have been in the transportation sector, machine-tool and technological equipment building sector and the electrical equipment manufacturing sector, all of which have historically experienced rapid growth thereby generating an equally rapid growth in demand for bearings.

B. Domestic Romanian Market - Projected Demand and Supply

4.05 A high growth in demand for bearings in Romania is likely to continue in the foreseeable future, although below the rate achieved in 1970-75. This is due, during the 1976-80 period, to the lower planned growth rates of the Romanian economy in general and of the major bearings consuming sectors more specifically. CIROA's projections of the bearings market for 1976-85 are discussed in detail in Annex 4-1 and summarized below:

Romania: Projected Demand of Bearings 1975-85
(Millions of Pieces)

	1975	1976	1977	1978	1979	1980	1985	Growth Rate 1975-80	Growth Rate 1980-85
	(Actual)	Est.	- - -	Projected	- - -	- - -	- - -		
Transp. incl. Tractors	14.5	15.6	16.0	17.0	18.0	17.6	22.1	4.0%	4.7%
Machine Tools, Equip.	4.2	4.7	5.5	6.5	7.4	7.8	12.8	13.3%	10.2%
Electrical	4.6	5.2	6.0	7.1	8.1	9.1	12.7	14.6%	6.9%
Other OEM	11.6	14.0	14.3	14.2	13.0	15.6	18.7	5.9%	3.7%
Total OEM	34.9	39.5	41.8	44.8	46.5	50.1	66.3	7.4%	5.8%
Replacement	11.7	12.5	13.2	14.2	15.5	14.9	18.7	5.0%	4.6%
Total Demand	46.6	52.0	55.0	59.0	62.0	65.0	85.0	6.9%	5.5%

4.06 The forecast indicates an average annual growth rate of 6.9% between 1975-80 and 5.5% during 1980-85, compared to 12.7% experienced during the last Plan period (1970-75). In Romania, consumption is more a function of State planning and allocation than of market and price consideration. Therefore, demand projections should be evaluated less on an extrapolation of historical consumption figures but primarily on an end-use analysis, taking into consideration plans approved for individual sectors and actual users of bearings. Such an analysis, detailed in Annex 4-1, indicates that the market growth projected in the above table may be overly conservative, if the national economy indeed grows at the rate specified in the 1976-80 Plan and visualized for 1981-1990.

4.07 Industry plans call for an increasing share of the total market to be supplied from domestic production with a parallel increase in exports as indicated by the table below. However if the actual domestic demand indeed turns out to be higher than projected by CIROA, as seems possible, then the surplus left for exports would be reduced.

Romania: Projected Demand/Supply of Bearings 1975-1985
(Millions of Pieces)

	1975	1976	1977	1978	1979	1980	1985
	Actual	Est.	- - -	Projected	- - -	- - -	- - -
Total Domestic Demand	46.6	52.0	55.0	59.0	62.0	65.0	85.0
Domestic Production	70.7	74.4	81.0	94.0	107.0	112.0	145.0
Imports	6.4	4.5	5.0	5.0	5.0	5.0	4.0
Exports	21.6	35.0	37.5	41.0	47.0	52.0	63.0
Imports/Domestic Demand	14%	9%	9%	8%	8%	8%	5%
Exports/Domestic Prod.	31%	47%	46%	44%	44%	46%	43%

4.08 Imports of bearings will continue to be restricted to those types which cannot be produced domestically. These primarily consist of high-precision bearings needed for use in sophisticated machinery, aircraft and other advanced equipment, which are produced mainly in developed countries. Some imports also relate to bearings needed, in very small quantities, to maintain old imported equipment.

C. Export Markets for Romanian Bearings

4.09 Export markets have absorbed between one-third and one-fourth of total Romanian bearings production since 1965 and from 1974 Romania has been a net exporter of bearings. As shown in the following table, initially bearings were exported primarily to COMECON member countries and to countries with which Romania maintained bilateral trade relations.

Romania: Historic and Projected Bearings Exports 1965-85
(Millions of Pieces)

	1965	1970	1974	1975	1976	1978	1980	1985	Growth Rate 65/76	Growth Rate 76/85
	--------Actual--------				Est.	----Projected---				
Total COMECON Countries	3.1	2.9	4.4	3.9	8.0	10.0	12.2	18.0	9.0%	9.3%
OECD Countries /a	0.5	2.6	5.3	11.8	12.8	15.7	19.1	22.6	34.4%	6.5%
Others /a	0.5	1.9	4.2	5.9	14.2	15.3	20.7	22.4	35.8%	5.2%
Total Exports	4.1	7.4	13.9	21.6	35.0	41.0	52.0	63.0	21.6%	6.7%

/a Including sales to international bearing companies.

However, since the late sixties, concerted efforts have been made to increase the share of bearings exported to convertible currency areas. In addition to employing usual marketing techniques, CIROA and TECHNOEXPORTIMPORT reached agreements with leading bearings producers in Western Europe and Japan for sales of bearings under multi-year contracts. Most of the bearings exported are technically relatively simple to produce and are used in large volume. In market economies, their sales are sensitive to price, quality and customer service. The export projections in the table reflect five-year trade agreements signed with COMECON members, bilateral trade agreements with a number of other countries, commercial deals agreed with some of the leading bearings companies in OECD and the perceived potential of direct export of bearings.

4.10 The world bearings industry is currently in an unusual situation. In the early seventies, the industry enjoyed strong sales as most developed economics, which are the main consumers of bearings, maintained relatively high growth. In some countries, particularly in North America, there were periods when demand marginally exceeded supply resulting in long delivery times. During the same period, major new developments were taking place on the supply side. Most large producers, led by Japanese and US companies, introduced large-scale automation in the production of many ball bearings (and subsequently of some tapered roller bearings) sold in large volume. This not only reduced relative production costs in this formerly labor-intensive industry, but also created substantial new capacity specially in Japan and Western Europe.

4.11 At the same time, major expansion programs were launched in a number of East European countries, aimed to increase manifold their exports to convertible currency areas. Much of the new capacity came on stream just as the worldwide economic slowdown was depressing sales in late 1974 and in 1975, adversely affecting sales and capacity utilization and limiting the producers' ability to adjust their prices to reflect sharply increased input costs 1/. Most countries consider their bearings industry of strategic importance. As domestic producers in the US and Europe faced increased competition from imports during a period of declining sales and profits, many governments initiated actions to restrict imports in 1975 and 1976.

4.12 While the above situation is considered temporary and sales started to recover in 1976, the recent developments will make the planned substantial increases in Romanian exports to OECD countries more difficult, particularly if most expansion programs currently under consideration in other centrally planned economies are indeed proceeding as planned. Romania's total 1975 direct exports to both COMECON members and developed economies were substantially below original targets though sales did improve in 1976. The Romanian authorities seem aware of this problem and have initiated a thorough review of the export targets and of export marketing arrangements. As a result, Brasov's expansion program was extended in time and its export targets for convertible currency areas were reduced somewhat.

D. Brasov Enterprise's Market

4.13 Brasov's recent and projected total sales are shown in Annexes 4-3 and 4-4, summarized in the following table and discussed further below:

Brasov Enterprise - Total Bearings Sales 1971-85
(Millions of Pieces)

	1971	1975	1976	1978	1980	1985	Growth Rate 1971-75	Growth Rate 1975-85
	---Actual---		Est.	---- Projected ---				
Total Sales	21.1	28.5	27.8	34.0	43.0	53.0	7.8%	6.4%
Domestic Sales	15.3	22.5	21.7	25.6	31.0	40.0	10.1%	5.9%
Exports	5.8	6.0	6.1	8.4	12.0	13.0	1.2%	8.0%
(COMECON)	(1.7)	(4.2)	(4.6)	(3.5)	(4.8)	(5.3)	26.0%	2.4%
(Other)	(4.1)	(1.8)	(1.5)	(4.9)	(7.2)	(7.7)	NA	16.3%
Domestic Sales as % of total	72%	79%	78%	75%	72%	75%		
Brasov Share of Domestic Market	85%	48%	42%	43%	48%	47%		

1/ It is understood that, in mid-1976, most European producers had about one-third of their capacity idle.

Domestic sales as a percentage of total sales are expected to decline marginally between 1976 and 1985, and the export market share is expected to increase slightly, partly due to the increases directed towards convertible currency countries.

4.14 Domestic Markets: The following table summarizes past and future domestic sales by major consuming sector, as summarized from Annexes 4-5 and 4-6:

Brasov Enterprise - Domestic Sales 1971-85
(Millions of Pieces)

	1971	1975	1976 Est.	1980	1985
Transp. incl. Tractors	4.6 (30%)	6.8 (30%)	7.1 (33%)	9.8 (32%)	12.5 (31%)
Machine Tools, Equip.	1.4 (9%)	2.0 (9%)	2.2 (10%)	3.4 (11%)	5.1 (13%)
Electrical	1.6 (10%)	2.2 (10%)	2.3 (10%)	3.9 (12%)	5.1 (13%)
Other OEM	4.1 (27%)	6.5 (29%)	4.7 (22%)	6.1 (20%)	7.6 (19%)
Replacement Market	3.6 (24%)	5.0 (22%)	5.4 (25%)	7.8 (25%)	9.7 (24%)
Total Sales	15.3(100%)	22.5(100%)	21.7(100%)	31.0(100%)	40.0(100%)

Historically, transportation vehicle and agricultural tractor producing enterprises have accounted for about 30% of Brasov's total domestic sales and this is expected to remain unchanged during the forecast period; a stable share is also forecast for the replacement market. On the other hand, due to the projected changes in the Enterprise's product mix and the higher production growth rates planned for the machine tool and electrical and other equipment manufacturing plants, Brasov's sales share to these sub-sectors would increase by over 30%, compensated by a decline in the proportion of sales to other original equipment manufacturers (OEM). These changes are generally in line with the trend for the total Romanian bearings industry.

4.15 Exports: Brasov's historic and projected export sales are evaluated in Annex 4-2 and summarized below:

Brasov Enterprise - Export Sales 1971-85
(Millions of Pieces)

	1971	1975	1976 Est.	1977	1978	1979	1980	1985	Growth Rate 1971-75	Growth Rate 1975-85
Total Exports	5.8	6.0	6.1	7.1	8.4	9.7	12.0	13.0	1.2%	8.0%
of which										
COMECON	1.7	4.2	4.6	3.3	3.5	3.8	4.8	5.3	26.0%	2.4%
Other	4.1	1.8	1.5	3.8	4.9	5.9	7.2	7.7	NA	16.3%

Between 1976 and 1985, Brasov's total exports are expected to almost double, after a major rebound expected in 1977 as exports to convertible currency countries recover to 3.8 million pieces compared to 1.5 million in 1976, when

Romanian exports were severely hurt by the lack of demand in Western Europe (1974 exports were 4.1 million). Brasov's medium-term export plans are considered reasonable and should be achieved if the planned improvements in the export marketing organization are carried out (para. 4.23) and if the proposed product buy-back sales agreements with foreign manufacturers are indeed implemented (para. 5.05).

E. Prices

4.16 Until the general resetting of prices in Romania, which became effective in 1976, there were three different levels of domestic prices for bearings: (a) the "calculation price" (also known as producer price) received by the producing enterprise; (b) the "delivery price," higher than the calculation price, paid by the original equipment manufacturers to the distribution enterprise; and (c) the "retail price," higher than delivery price, paid by small consumers to retailers. These prices had remained generally unchanged since 1963, when most bearings were imported and delivery prices were set in line with international prices. However, since calculation prices were set to provide the producing enterprise a 10% margin on costs and because, with time, most domestic inputs like steel and labor became priced much below world prices and the production costs also declined due to increased economies of scale, calculation prices dropped substantially below delivery prices. With the recent resetting of prices, which almost doubled the bearing steel price, the cost of bearings production and therefore calculation prices were raised about 40% and 30% respectively as of January 1, 1976. However, the delivery prices have been simultaneously lowered by about 18%, by equating the delivery and calculation prices. These changes are described in detail in Annex 4-9.

4.17 Revised domestic delivery prices are approximately two-thirds of the estimated prices charged by leading international producers from their OEM customers. However, considering that the Romanian prices do not include any marketing and transportation charges, and taking into account quality differences, domestic prices are considered to be in line with international prices.

4.18 Furthermore, Romanian export agencies maintain two separate lists of export prices - one for COMECON countries and the other for market economy countries. The prices applicable for COMECON trade are fixed by the Central Organization of Bearing Producers and Consumers (OCIR) in COMECON, on the basis of the weighted average of prices offered by all producing countries in COMECON. These negotiated prices in Roubles are currently, on the average, approximately 9% higher than domestic Romanian prices, if converted at the effective 1 Rouble = 20 Lei rate. 1/ Until 1975, OCIR prices were fixed for five years but from 1976 onwards they are subject to annual review.

4.19 The pricing structure followed in the world bearings industry does not allow an accurate comparison between prices charged by different suppliers. The price of the same product varies between the types of suppliers (large established suppliers enjoy a premium over smaller, newer companies) and also

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1/ In Romania, for purposes of foreign trade, currently one Rouble is treated as equal to one Dollar in value even though at the official rates of exchange a Rouble is equal to US$1.3.

depends on the customers (large original equipment manufacturers pay much lower prices than retail customers). Furthermore, there are thousands of products and the published catalog prices are often many times more than the actual prices paid by most customers. While it is extremely difficult to determine the actual sales prices, it is estimated that in mid-1976 major bearings producers in North America and W. Europe were selling bearings at discounts varying between 55-70% below catalog prices, with another 30% rebate on the discounted price offered to OEM consumers. The prices listed in TECHNOEXPORTIMPORT's catalog for customers in market economies are, in general, slightly higher than domestic Romanian prices and follow the pattern of published catalog prices of leading bearings companies. TECHNOEXPORT also follows the international industry policy and offers discounts on its catalog prices but, due to generally lower quality of its products, lack of adequate technical service and marketing effort, and due to non-familiarity of customers with Romanian bearings, its average export price of bearings is estimated to have been often substantially below prices charged by major producers in Western Europe; however, a comparison of Brasov's expected costs and revenues confirms that even from these exports Brasov will recover, on the whole, full cost of production. But it is also believed that, like some other recent new entrants in the market, TECHNOEXPORT would be able to obtain better prices once its products are established in the market, the product quality is improved to international levels (para. 5.06) and the export marketing organization is strengthened (para. 4.23).

F. Distribution System

4.20 CIROA also has a warehousing enterprise known as BAZA, headquartered in Brasov. BAZA maintains warehouses at each plant and in each region and is obligated to keep an average of about three-months supply of bearings at these locations. It deals directly with the large consumers in Romania, but the small consumers are served through numerous state-owned retail outlets, supplied from BAZA's decentralized warehouses located in individual judets.

4.21 The quantity, type and quality of bearings to be distributed to various consumers is determined by BAZA on the basis of requests received from the original equipment manufacturers and within the general context of the five-year plan and the availability of bearings. This general five-year allocation becomes the basis of a detailed annual distribution plan. BAZA also offers technical assistance to the consumers for selecting the right type of bearing for their application. It relies on the Design Center for expert advice whenever a customer requires bearings for a new application. The domestic distribution system is satisfactory.

G. Export Marketing Organization

4.22 As already mentioned in para. 2.07, the responsibility for exporting bearings is assigned to TECHNOEXPORTIMPORT, an arrangement consistent with the Romanian foreign trade system. Until recently, TECHNOEXPORTIMPORT maintained no overseas sales offices devoted mainly to bearing sales or warehouses to provide quick service to customers. While this system is possibly adequate

for exporting commodities or established products (Romania's traditional exports) and for bilateral trading areas, for exporting precision and price sensitive items like bearings to developed countries, which normally require extensive customer service, this insulation of marketing and production functions is deficient. Even after the expected improvements in product quality, Romania may find it difficult to profitably meet its export targets to convertible currency countries, unless some organization changes are forthcoming. This judgment is supported by the relatively low prices Romania is obtaining (para 4.19) and its poor export performance in 1975-76 (para 4.15) in these countries.

4.23 Romanian authorities are aware of this problem and are currently implementing a major reorganization of export marketing under which: (a) TECHNOEXPORTIMPORT and CIROA would work together more closely to develop export markets; (b) overseas regional sales offices, devoted exclusively to bearings exports and supported by warehouses, would be opened; (c) CIROA has created a new export department in Brasov; and (d) TECHNOEXPORTIMPORT would create a separate bearings export department and expand its sales force. These changes are in the right direction and it is expected that Brasov's export targets can be achieved and higher export prices realized if they are effectively implemented. Satisfactory agreements have been reached with the Government that these improvements in the marketing arrangements would be implemented.

V. THE PROJECT

A. Scope and Objectives

5.01 The proposed modernization and expansion project is an important part of the overall industry rationalization program described earlier in para 2.04. The project is designed to achieve four basic objectives: (a) to expand annual production capacity from its present level of 20.0 million pieces of bearings to 33.5 million by 1982; (b) to bring the average quality of bearings nearer to international standards; (c) to produce a wider range of bearings in order to minimize Romania's reliance on imported bearings; and (d) to improve the overall productivity of the Enterprise through the introduction of modern production processes and equipment. The project was designed, engineered and revised by the Brasov Enterprise, in close collaboration with the Design Center, between early 1975 and February 1977. In addition to these project facilities, Brasov is currently also expanding some other plant facilities as explained in para 5.05.

B. Project Components

5.02 The project consists of two distinct and technically separable components: (a) erection of one new modern, fully automated high volume production line (the Hi-Volume Component) with a capacity of 5.5 million bearings; and (b) modernization and expansion of low volume facilities (the Low-Volume Component) to reach a final capacity of 28.0 million pieces of a relatively higher value product mix. The latter would include facilities for substantially

increasing the production of tapered roller bearings from 2.6 million to 14 million pieces. 1/ In addition, necessary auxiliary facilities like utilities and general maintenance shops as well as physical infrastructure would be expanded to support increased production. The Hi- and Low-Volume components would share a common forge shop, a ball shop and a small retainers shop. A detailed description of the project is given in Annex 5-2.

5.03 The Hi-Volume component of the project has been specifically designed to produce bearings needed in large numbers and on large production runs permitting the use of specialized equipment and a high degree of automation. It will include one automated line, with a capacity of about 10,000 bearings per shift, which starts with forged rings for inner and outer races at one end and finishes with fully inspected and assembled bearings at the other end. The basic process is shown in detail in the flow chart (Annex 5-3) and the plant layout (Annex 5-4). The component is technically well conceived and is comparable to new plants being developed elsewhere.

5.04 The basic production steps to be used in the Low-Volume component are the same as above (see Annexes 5-5 and 5-6 for the layout and flow chart). But, since the Low-Volume component would produce a much greater variety of bearings in a wider range of sizes, it would be equipped with more flexible, general machining and grinding equipment. The assembly and inspection operations as also most of the material handling and machine loading would be manual, as dictated by the relatively shorter production runs. A significant portion of the Enterprise's current production facilities, which would form the nucleus of the Low-Volume component, are old and in need of urgent modernization. Under the project, obsolete equipment would be scrapped and up-to-date machinery installed, particularly for ball and roller making, machining, grinding and quality control to reach the desired quality mix. At the same time forging, ball and roller making capacity would be increased to utilize the additional machining, grinding and heat-treatment capacity created partly from this modernization but primarily from the shift of some 5.0 million bearings currently produced by low-volume production processes to the new high-volume production line.

5.05 In addition to the above mentioned components proposed for Bank financing, the Enterprise is also considering expanding the production of needle, cardan and special bearings from 10.5 million pieces to 19.5 million. This facility, technically and physically separate from the project, will be implemented and financed with assistance from Koyo Seiko, one of the leading international manufacturers in this field. Negotiations for such cooperation, and a complementary product buy-back agreement, were concluded in early

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1/ These capacity estimates are based on the proposed product mix, current operating practices and three shift operations. As in most other mechanical industries, it is extremely difficult to calculate the exact capacity of a bearings plant.

1977. Since, at the time of appraisal in mid-1976, it was uncertain when and if such an agreement would be finalized and implemented and because Bank assistance for it was not considered necessary, this facility has not been reviewed in detail. Implementation of this facility is not likely to have any adverse impact on Brasov's ability to carry out the project being financed by the Bank.

C. Quality Improvement

5.06 Currently, the average quality of bearings produced at Brasov is below world standards, primarily due to the use of old and obsolete equipment This leads to less accurate tolerances and, in turn, to a reduction in the average expected useful life of bearings and a higher noise level; these are the two most critical areas that determine bearing quality. In 1975, 45% of bearings produced at Brasov were rated as PO, which is the lowest quality standard and, though used in non-critical applications, is not normally produced in significant quantity by most reputed manufacturers in developed countries. A detailed description of quality designations and Brasov's quality-mix is given in Annex 5-1.

5.07 The project is designed to substantially improve the quality of bearings production through (a) introduction in the Hi-Volume component of a fully automated production line with in-process gauging; (b) replacement of older machines and tools with more accurate equipment in the low-volume production facilities; (c) erection of a new ball-shop; and (d) improvement in inspection and quality control techniques. As a result, after project completion Brasov's quality-mix would approach international norms as summarized below:

Brasov Enterprise: Improvement in Quality Mix 1975-85

Quality Designations	% in 1975	% in 1985
PO	45	10
P6	40	60
P5	10	20
P4	5	10
	100	100

D. Product Mix

5.08 The choice of production process and the cost effectiveness of a bearings plant are greatly dependent on the product mix. A bearings plant designed to produce only a limited range of similar bearings in large volume can be designed for low skilled labor needs and for high equipment utilization and product quality. On the other hand, bearings plants producing a large variety of bearings in relatively short average runs, must use flexible and therefore general purpose machine tools and tend to have relatively higher production costs due to much higher skilled labor needs and lower equipment utilization. Most new bearings plants currently under implementation in developed countries are based on the high-volume production techniques

to counter rising labor and equipment costs; as a corollary, the industry worldwide is making every effort to narrow the variety of bearings (and thus increase production runs) in individual plants.

5.09 In 1975, Romania consumed about 47 million bearings of some 6,000 different series numbers. 1/ Of these, about 41 million bearings consisting of some 600 series numbers were supplied from domestic production and the balance 6 million pieces of about 5,400 series numbers were imported. Under the Government's instructions, CIROA is to widen the product mix of domestic production to about 900 series numbers in 1980, in order to reduce expected imports by about half. The proposed expansion project at Brasov has been designed to achieve a part of this objective.

5.10 Brasov currently produces about 30 million bearings of 210 basic sizes (in 312 different series numbers) and proposes to produce 340 basic bearing sizes (in 428 different series number) after the expansion project. A detailed analysis of the product mix (Annex 5-7) indicates that the product mix proposed for the Hi-Volume component is fully comparable to that of most modern bearings plants currently under development elsewhere. On the other hand, the product mix proposed for the Low-Volume component is not in line with this industry trend and could be improved by reducing the number of bearings produced in very small runs. While minimum economic production volume depends greatly on the size, complexity and the sales value of a bearing, it is believed that before adding any bearing with an annual volume below 50,000, the economics of such production must be established. The elimination of a number of bearings falling in this category could substantially improve equipment utilization and thus improve the economics of this project component; any likely changes in product mix are not expected to have a significant effect on the type or design of equipment. The Government has agreed to have the Enterprise undertake by March 31, 1978 such a review, which would be carried out by the proposed industrial engineering group as one of its first assignments (para 5.14).

E. Labor Needs and Training

5.11 As discussed in detail in Annex 5-8, Brasov has currently 6,280 employees 2/ and had plans to raise the number by 1,244 persons to 7,524 2/ upon project completion. These numbers indicate substantially higher labor requirements than in similar bearings' plants in developed countries with comparable product mix. The Bank's review indicated that Brasov's labor needs could be cut 10 to 15% below this level, without affecting the output or the investment cost substantially. This would mean that instead of increasing

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1/ The same size and type of bearing can have many different types of seals, cases, etc., and thus lead to a number of different series numbers. The exact number of different sizes of bearings used in Romania is not known but is reportedly substantially less than the 6,000 series numbers used.

2/ Excluding labor needs of the needle, cardan and special bearings facilities and of the proposed new machine tools plant.

the labor force by about 1,250 new workers, as originally proposed, the project should need no more than about 400-500 new workers.

5.12 The Bank has made specific recommendations for changes in layout and labor practices in some key plant areas, to assist Brasov in conducting a review of its additional labor needs which the Government has ordered in response to the Bank's findings. This review has been initiated and has already identified areas to reduce labor needs by about 200 workers. It will be completed before March 31, 1978, by the proposed industrial enginering group, after the selection of critical equipment is finalized towards the end of 1977. Brasov will continue to discuss progress of this review with the Bank.

5.13 The training of workers is well organized at Brasov, which runs a large training school next to the plant. Other institutes such as vocational and engineering schools run by the Government provide well trained supervisors and skilled technicians. The Enterprise is aware that adequate worker training is critical to achieving the project's demanding objectives. It has drawn up a detailed program to ensure that all necessary skills are available on time. The training schemes to be employed under this program and details of different types of workers and supervisory staff to be trained during 1976-80 are given in Annex 5-9. The training arrangements proposed are adequate.

F. Industrial Engineering

5.14 The industrial engineering techniques widely employed in other Bank member countries are not being used adequately at Brasov. An increased use of systematic analysis of product mix, basic work methods, plant layout, material handling and production standards is expected to lead to improved labor productivity and equipment utilization and thus reduce production costs. Brasov has agreed to form a small Industrial Engineering Methods and Standards Group within its organization. As its first tasks this group would recommend possible improvements in Brasov's product mix, labor productivity and inventory levels to further enhance the plant's economic viability (para. 5.12).

G. Raw Materials and Utilities

5.15 No difficulties are foreseen in obtaining raw materials, the most important of which are special (chrome) steels in bar form. At present Romania is not self-sufficient in the special steels required for bearings production and, in 1975, Brasov imported about half of its 45,000 ton needs, which are about to double (85,000 tons/year) after project completion. However, before end-1980 the new Tirgoviste Steel Complex, partly financed by a Bank loan, will come into production and supply most of Brasov's special steel needs. The project would also annually need about 3,000 tons of bimetallic bands for the production of plain bearings, and small amounts of brass rings and tool steels which are also adequately available domestically. The Government has confirmed to the Bank that the recent earthquake will have no adverse effect on Brasov's raw material supplies or on any other requirements.

5.16 Regarding utilities, Brasov will require approximately 192 MWH/year after project completion, compared to about 90 MWH at present. Satisfactory

arrangements have been made with the national power system to supply these requirements. Similarly, no difficulties are foreseen in obtaining the plant's modest requirements of water, gas, steam, compressed air and other utilities (Annex 5-2).

H. Ecology

5.17 The project has been designed after a careful consideration of environmental and worker safety aspects. A Romanian law for environmental and pollution control, passed in 1973, stipulates that all industrial enterprises must conform to environmental and workers safety standards specified in the legislation relevant to the industry concerned. The Brasov enterprise is within these standards except for inplant air quality and noise levels in the forge shop, ball shop and primary machining shop. Under the project, necessary provisions have been made to develop new facilities in conformity with the specified standards and to upgrade the working conditions in existing facilities at least up to the minimum legal requirements, as discussed in Annex 5-10. In addition, in some key assembly, lubrication and final inspection areas, air-conditioning and air-filtering systems would be expanded both to improve the working conditions and to ensure better product quality. No significant adverse external environmental impact is expected from the project. The Bank has obtained satisfactory assurances that, after project completion, the plant will conform to satisfactory environmental standards, adequately monitored.

VI. PROJECT IMPLEMENTATION AND ORGANIZATION

A. Implementation Schedule

6.01 The project implementation schedule is shown in Annex 6-1. Engineering and design of the project as originally proposed are well advanced, though further work in this area is now necessary, both because in May 1976 the project completion date was postponed from mid-1980 to end-1981 and because of the Government's ongoing review of the project's product-mix and the labor force build-up. Physical implementation started in early 1977. Some of the Low-Volume facilities are forecast to become operational in late 1979 (though all the facilities will have been installed only by 1981) and the Hi-Volume component is expected to be completed by December 1980 (Annex 6-2); full capacity production of the target would only be attained in 1985. Equipment delivery and construction schedules, which are considered reasonable, are based on information provided by potential suppliers as well as by CIROA and the Enterprise.

B. Project Management

6.02 The Brasov Enterprise will have primary responsibility for project implementation. Since the Enterprise and CIROA have common senior staff, the project, in effect, would draw on the experience gained by CIROA in the recent execution of the Alexandria and Birlad projects (para. 2.03). Thus, the Enterprise can be reasonably expected to have sufficient

well experienced personnel to satisfactorily manage project implementation. Direct responsibility for project execution is delegated to CIROA's Engineering Department, which is headed by a competent and experienced engineer who will report to Brasov's Technical Director. For coordinating and supervising the procurement activities, Brasov has designated another experienced engineer who was the chief engineer of the Alexandria plant during its recent construction. Brasov's project implementation unit, adequately supported by CIROA, is considered competent to carry out the project.

6.03 The organizational setup for project implementation is shown in Annex 6-3. The project will be designed and engineered by Brasov's (and CIROA's) Engineering Department in close collaboration with the Design Center (para 2.08) and the Central Design Institute for Machine Tools. The plant facilities will be constructed by the Enterprise for Erection of Special Industrial Buildings, a Construction Trust working for the Ministry of Machine Building; the trust was responsible for erecting other bearings plants and thus is well suited for this assignment. The project implementation unit would be directly responsible for selecting and contracting locally produced equipment and supplies. But, as required by Romanian law, six foreign trade enterprises will be involved in procuring imported equipment and will have to become familiar with the Bank's procurement procedures. To minimize potential problems, Brasov has appointed a procurement coordinator. The Bank has also obtained assurances that UZINEXPORTIMPORT will coordinate the activities of the six foreign trade enterprises and will also create a small group within it to handle procurement for the project.

VII. CAPITAL COST AND FINANCING PLAN

A. Project Costs

7.01 Total capital cost of the project is estimated at Lei 1,755.2 million (US$87.8 million) and total financing required, including interest during construction, at Lei 1,861.0 million (US$93.1 million) as detailed in Annex 7-1 and summarized below:

Summary of Capital Costs
(Millions)

	Local	Foreign	Total	Local	Foreign	Total	%
	----------Lei----------			----------US$--------			
Equipment and Machinery	507.9	487.1	995.0	25.4	24.4	49.8	73.7
Imported Spares	-	41.0	41.0	-	2.0	2.0	3.1
Installation and Utilities	109.5	38.9	148.4	5.5	1.9	7.4	11.0
Buildings & Civil Construction	146.7	6.0	152.7	7.4	0.3	7.7	11.2
Design, Engineering, Training and Project Management	12.9	1.0	13.9	0.6	0.1	0.7	1.0
Total Base Costs	777.0	574.0	1,351.0	38.9	28.7	67.6	100.0
Physical Contingencies	40.0	60.0	100.0	2.0	3.0	5.0	7.4
Price Contingencies	-	126.0	126.0	-	6.3	6.3	9.3
Total Fixed Assets	817.0	760.0	1,577.0	40.9	38.0	78.9	116.7
Working Capital /a	178.2	-	178.2	8.9	-	8.9	13.3
Total Project Cost	995.2	760.0	1,755.2	49.8	38.0	87.8	130.0
Interest during Construction /b	-	105.8	105.8	-	5.3	5.3	
Total Financing Required	995.2	865.8	1,861.0	49.8	43.3	93.1	

/a Including domestic spare parts.
/b Calculated at 8.2% interest rate.

7.02 Annex 7-2 gives a detailed allocation of the project costs between the Hi- and Low-Volume components, which account for about 14% and 86%, respectively, of base costs. The project cost estimates were prepared by the Enterprise in collaboration with the Design Center in early 1977 and were revised by Bank staff in March 1977 to include a more adequate provision for price escalation. The revised estimates make an escalation allowance for about 21.9% of base costs of imported equipment. Price escalation was calculated on the basis of foreign equipment costs increases of 7.5% each in 1977 and 1978, and 7% a year thereafter. No price increases are assumed since orders for local equipment and civil works will be placed on a fixed price basis in 1977-early 1978 and no price revisions are expected until then.

7.03 Civil construction costs are based on the physical quantities estimated by the Design Center and the unit construction cost rates established by the Government. Since substantial engineering work has been completed and because unit rates are not likely to change significantly through 1980, the estimated cost of civil construction is considered reasonable. The total cost estimates include a relatively small provision for physical contingencies of about 7.4% of base costs, since in the Romanian system changes in project scope and cost are normally not permitted after project approval, which has already been given, and because project engineering is at a relatively advanced stage. The estimated total project costs are considered realistic (Annex 7-3).

B. Working Capital

7.04 The project cost estimates include a provision for incremental working capital of Lei 178.2 million (Annex 7-4). Working capital was calculated on the basis of Brasov's current practices and after considering the expected improvements in inventory control as a result of a) the proposed introduction of a computer system for production control; and b) due to the improved throughput of the plant after the introduction of the Hi-Volume production line. However, since Brasov has not yet undertaken a detailed study of the potential benefits that can be derived from this computer introduction in reducing its working capital requirements, an agreement has been obtained that the Enterprise will complete such a study before March 31, 1978.

C. Financing Plan

7.05 The total financing requirements of the project (Annex 7-5) of Lei 1,861.8 million (US$93.1 million) are proposed to be met as follows:

Proposed Financing Plan
(Millions)

	Lei			US Dollars		
	Local	Foreign	Total	Local	Foreign	Total
IBRD Loan	-	760.0	760.0	-	38.0	38.0
State Funds	28.8	105.8	134.6	1.5	5.3	6.8
Funds Retained from Operations	788.2	-	788.2	39.4	-	39.4
Funds for Working Capital	178.2	-	178.2	8.9	-	8.9
Total Financing	995.2	865.8	1,861.0	49.8	43.3	93.1

7.06 The above financing plan assumes a Bank Loan of US$38.0 million to cover the estimated foreign exchange cost of the project (exclusive of interest during construction on the Bank loan) or about 43% of total project costs. The balance of the financing required to meet such interest and local currency expenditures, as well as additional funds to cover any unexpected cost overruns in local and/or foreign currency, will be provided by the State. Due to the severe foreign exchange shortage in the country, the Romanian authorities have set a value limit of about US$26 million equivalent on the direct imports to be permitted for the project. However, considering the price increases projected during project implementation, it is estimated that these contemplated imports would cost approximately US$31.5 million. To ensure that the project remains technically acceptable and is executed along the lines presented to the Bank, two complementary agreements have been obtained from the Government: that: (a) the specific equipment, spares and related services to be imported that were presented to and agreed with the Bank (Annex 7-3, Attachment I) would remain essentially unchanged, unless otherwise agreed to by the Bank; and (b) the Government would agree to permit imports above the limit currently set by it in case this becomes technically necessary.

7.07 The Bank loan is proposed to be extended to the Investment Bank for 13 years, including 3 years of grace, at the prevailing interest rate. As in the case of other Bank projects in Romania, the Investment Bank would pass on the loan proceeds to the Enterprise, together with the State Funds, as equity. However, assurances have been obtained that annual depreciation remittances and benefits will be sufficient to cover (notional) payments of interest and principal on the Bank loan assumed to be identical to those due to the Bank, except for an interest rate of 10%.

D. Procurement

7.08 The Bank loan would finance the foreign currency cost (Romanian border or port of entry) of imported equipment, spares and related services, and FOB ex-factory cost of local equipment spares and related services. The Bank financed items would be divided into about 30 equipment packages and be procured through international competitive bidding in conformity with Bank guidelines, except for items, not exceeding US$1.7 million in total value, which are estimated to cost less than US$100,000 equivalent each or which are not suitable for procurement through ICB for technical reasons. These latter items will be procured by prudent international shopping, in accordance with the Bank's procurement guidelines. Agreement has been reached that the specific items of equipment, spares and related services listed in Annex 7.3, Attachment I, and considered critical to the project's technical viability, would be imported from Bank member countries and Switzerland, and that both foreign and Romanian suppliers will participate in the international competitive bidding of items to be selected from those listed in Annex 7.3, Attachment II. Bank financing of the latter items will be limited to the estimated total indirect foreign exchange cost of the project. For purposes of bid comparison, Romanian suppliers participating in ICB will be accorded a 15% preference. Romanian suppliers are expected to win most of the bids in which they participate. Local equipment, civil works and services to be financed by the Government would be procured according to Romanian procedures, which are considered satisfactory for this purpose (paras. 6.03 and 7.02).

7.09 The detailed equipment lists have been prepared and the bid packages are being finalized. Prequalification is expected to be completed by June 1977 and most bids received between August 1977 and February 1978. This assumes that only single stage bidding will be employed. A detailed description of contemplated procurement arrangements and lists of equipment to be procured under the loan are given in Annex 7-7.

E. Allocation of Bank Loan and Disbursements

7.10 The allocation of loan proceeds will be as below:

Allocation of Bank Loan

Category	Amount of Loan Allocated (US$ million)	% of Expenditures to be Financed
I. Imported equipment, machinery, spares and related services	26.0	100% of foreign expenditures
II. Other agreed equipment, machinery, spares and services	6.5	100% of foreign expenditures or 100% of ex-factory cost of local expenditures.
III. Unallocated	5.5	
	38.0	

An understanding has been reached with the Government that the unallocated amount can be utilized only for agreed goods and services covered by Category I. However, should, contrary to current expectations, the import cost of items eligible under Category I be less than the US$31.5 million made available for them (US$26.0 million plus US$5.5 million), a part of the loan, equivalent to the resultant reduction in the total foreign exchange cost of the project, will be cancelled.

7.11 A forecast of estimated quarterly disbursements is given in Annex 7-6.

VIII. FINANCIAL ANALYSIS

A. Revenue and Operating Cost Estimates from the Project

8.01 Under the project, production volume would increase from its 1976 level of 20.0 million bearings to the full capacity level of 33.5 million in 1985, and the average sales price, in constant 1976 terms, would increase marginally from 46.5 to 49.2 lei/unit, due to the shift in the product mix toward slightly larger and higher-priced bearings. Total revenues from the project would increase from Lei 986 million (US$49.8 million) in 1976 (including bearing parts sales) to Lei 1,650 million (US$82.5 million) in 1985, as described in detail in Annex 8-1.

8.02 As mentioned earlier, a key objective of the project is to increase production efficiency and reduce production costs. After project completion, unit production costs are expected to decrease by 8% despite the planned shift to heavier and thus more expensive bearings. For the high-volume type bearings, variable production costs as a percentage of revenues would decrease by 13% in spite of the assumed 5% per annum wage increase; this is mainly a result of mass production technology which is expected to substantially reduce direct labor costs (by 41%) and material consumption (by 17%). The low-volume type bearings are also projected to show a small (6%) decrease in cost of production, because of an expected 35% decline in maintenance costs and a 28% decrease in indirect labor costs primarily due to economies of scale. The projected reduction in operating costs is discussed in Annex 8-2.

8.03 Detailed operating results forecasts for the project are given in Annex 8-3 and summarized below:

Brasov: Selected Operating Results for Project Components
(Millions of Current Lei)

	1976 (Est)	1978	1980	1982	1985
Production (m. bearings)	20.0	20.2	25.2	28.5	33.5
Total Revenues	986	1,008	1,245	1,410	1,650
Cost of Goods Sold	543	644	708	737	847
Gross Profit	442	364	537	673	802
Depreciation	75	80	139	176	101
Benefit After Interest (Profit)	184	166	274	315	532
COGS/Revenues (%)	55%	64%	57%	48%	51%
Benefit/Revenues (%)	19%	16%	22%	22%	32%

B. Financial Projections for the Enterprise

8.04 Detailed projections of Income Statement, Working Capital Needs, Balance Sheet, and Sources and Applications of Funds for Brasov Enterprise, including results of operations relating to needle and cardan bearings, are given in Annexes 8-4, 8-5, 8-6 and 8-7, respectively, and summarized in the following table.

Brasov Enterprise: Summary of Financial Projections
(Millions of Current Lei)

Income Statement and Cash Flow	1975 Actual	1976 Est.	1978	1980	1982	1985
			---------Projected---------			
Production (millions of bearings)	28.5	27.8	34.0	43.0	49.0	53.0
Revenue /a	853	1,103	1,208	1,518	1,732	1,953
Cost of Goods Sold /a	NA	625	725	801	837	942
Depreciation	79	95	106	212	260	166
Interest	-	-	-	-	53	34
Benefit after Interest	93	163	223	336	401	628
Benefit/Revenue (%)	11%	15%	18%	22%	23%	32%
Cash Flow Before Interest	172	258	329	548	714	828
Debt Service Coverage	-	-	-	-	5.5	7.5
Balance Sheet						
Current Assets	335	512	517	604	686	770
Current Liabilities	155	53	45	135	143	151
Current Ratio	2.2	9.7	11.4	4.5	4.8	5.1
Net Fixed Assets	835	901	1,297	2,088	2,354	1,715
Long Term Debt	-	-	146	394	532	304
State Funds for Fixed Assets	835	901	1,142	1,561	1,641	1,229
Debt/Equity Ratio	-	-	5:95	11:89	13:87	9:81

/a From 1976, both unit revenues and costs increase due to the recent price resetting.

8.05 Benefit as a percentage of revenues (rentability) declines from 24% in 1977 to 18.6% in 1979 because of initial inefficiencies in the project after start-up. As productivity improves and the interest burden falls, the rentability climbs to a level of 32% in 1985. The (notional) debt service coverage on the Bank loan remains ample throughout; similarly the current and debt/equity ratios remain satisfactory during the forecast period.

C. Major Risks, Breakeven Point and Financial Returns

8.06 Because of the centrally planned economy, many of the normal risks of operation of a business do not exist in Romania. Risks of work stoppages due to strikes are absent. The process and technology being adopted for the project components have been successfully used in other parts of the world for many years and also in other enterprises within Romania. Therefore, the process risks are believed to be small, though some of the equipment to be supplied to the project would be manufactured in Romania for the first time and thus entails some technical risks. Moderate risks exist for possible delays in project completion and for cost overruns due to increases in the cost of imported items; in case the Government tries to accommodate such increases by shifting some items from imports to local supply, it may increase the technical risks. The Bank plans to closely supervise the project to minimize such risks. Regarding market risks, the major consumers of bearings in Romania are committed to buying the agreed output at fixed prices through the mechanism of Five Year Plans; the risk of losing market share to other producers is also non-existent. Planned sales to centrally planned economies are also assured through COMECON agreements. Of course in case these economies, as a whole, grow slower than expected, bearing sales would also suffer. However, the domestic market forecasts are considered conservative and should be easily achieved barring an unexpected major disruption in the Romanian economy. The major risk is linked to the export markets in the Western countries. However, considering the small proportion of bearings to be exported to convertible currency countries (by volume about 15% of Brasov's production in 1980-1985 and by value even less), its impact on the Enterprise's total revenues and profitability is small. Moreover, it is estimated that over half of these export sales will be to international bearing companies through already agreed product buy-back or other long-term sales agreements. Therefore the project's market risk is considered acceptable and, as a consequence also, its financial risk moderately low.

8.07 The variable costs as a percentage of total production costs are estimated at 66%, giving a profit breakeven capacity utilization level of 40% or 13.2 million units. A detailed break-even analysis of the two project components is given in Annex 8-8.

8.08 The financial rate of return for the project is estimated at 14.5% in current terms (Annex 8-9). However, considering that in Romania all prices are administered, the internal rate of return is not a criterion for investment decisions and, since all productive enterprises are state-owned, it is also less meaningful than the project's impact on the State's fiscal resources discussed below and an analysis of the project's economic rate of return (Chapter IX).

D. Fiscal Impact Analysis

8.09 In most Bank projects, a financial analysis of the borrower is undertaken to determine if the borrower can bear the additional debt service burden imposed by the financing needs of a project. In Romania, the State not only bears the ultimate risk and responsibility of servicing the foreign borrowings, but also has a policy of insulating its enterprises from the impact of any such borrowing. Therefore, an analysis that measures the impact of the proposed project on the State budget, along with the ability of the budget to service the debt out of its cash flow from the project, is considered more relevant. A projected fiscal impact statement for project components is given in Annex 8-10 and summarized in the following table. The project would contribute substantial amounts of cash to the State budget. The lowest net contribution from the project would be in 1979 at Lei 60 million, increasing to Lei 565 million by 1985. The debt service coverage by the cashflow derived by the State from the project would be lowest at 4.8 times in 1982.

Summary of Fiscal Impact Statements 1976-1985
(Millions of Current Lei)

	1976	1978	1980	1982	1985
Total Cash Inflows to State Budget					
- with project	308	361	618	620	743
- without project	308	329	329	329	329
- Incremental	0	(32)	389	291	414
Total Cash Outflows from State Budget					
- with project	5	273	527	202	178
- without project	-	9	(10)	-	-
- Incremental	5	282	537	202	178
Net Impact on State Budget					
- with project	303	88	91	418	565
- without project	308	320	340	329	329
- Incremental	(5)	(232)	(249)	89	236
Debt Service Coverage	-	33.8	14.1	4.8	6.7

E. Auditing and Reporting

8.10 Romania has a fairly elaborate control and audit system under which enterprises submit periodic operational and financial reports to their Central, the Technical Ministry and the banks concerned. The Centrals and the Technical Ministries, as well as a special unit in the Ministry of Finance and the National and Investment Banks, conduct extensive audits of these reports to ensure achievement of Plan targets and proper use of funds. Though the presentation and contents of some of these reports is somewhat different from those normally received by the Bank, it is not very difficult to adjust them to provide sufficient information for the Bank to adequately monitor the progress of project implementation and operations. It has been agreed that Brasov will submit quarterly and annual project progress and financial statements in a

format satisfactory to the Bank and that the Bank will receive copies of annual audit reports prepared by the Ministry of Finance, within 45 days of the end of the reporting period.

IX. ECONOMIC ANALYSIS

A. Economic Benefits and Costs

9.01 For calculating the economic benefits and costs, international prices have been used for tradeable goods and services, and domestic prices for non-tradeables. Economic benefits for bearings consumed within Romania were calculated after considering the cheapest alternative source of bearings supply. Since the cost of bearings imports from COMECON countries is slightly less than from market oriented economies and also because Romania has a surplus in its trade with COMECON countries, the least cost source for domestically consumed bearings is considered to be COMECON, which can supply most types of the bearings to be produced under the project. The bearings for export to COMECON are priced at actual OCIR prices as used in the financial analysis, and those to convertible currency countries at their estimated actual export price to these countries but with an adjustment for the additional export revenues expected due to the projected quality improvement. The calculation of these economic benefits and costs is detailed in Annex 9-1.

9.02 In determining economic costs, special steel, which is the primary raw material representing about half of total production costs, was priced at international prices since: (a) even after the recent price resetting, the domestic steel price is still about 22% lower than the cost of imported special steel; and (b) Romania is a net importer of special steel. The financial costs of other inputs (e.g. labor, maintenance materials, etc.) are considered to fairly represent their economic costs and were therefore used in determining the economic operating costs. In calculating the economic investment costs, BAZA's additional working capital needs (38% of sales) have been added to the cost of the project.

9.03 The unit costs of inputs are expected to increase at a rate faster than the international price of bearings because increased competition in the international market, along with some productivity gains, is likely to prevent large increases in prices. These anticipated structural changes in the relative costs and benefits in real terms, described in Annex 9-1, are taken into account in the economic analysis.

B. Economic Rate of Return

9.04 The rate of return of the project is calculated at 15.6%, composed of an 22.1% return of the Hi-Volume component and one of 14.2% for the Low-Volume component. A sensitivity analysis is summarized below and detailed in Annex 9-2. The return would remain satisfactory (13.2%) even in the unlikely event of a 50% drop in export volume (or prices) to market economies, which is equivalent to an approximately 5% drop in total revenues.

Economic Rates of Return and Sensitivity Analysis

	Economic Rate of Return
Base Case (Incl. Drop in Bearings Price in Real Terms)	15.6%
Base Case & No Drop in Bearings Price in Real Terms	18.8%
Revenues Decrease 5%	13.2%
Production Decrease 5%	14.3%
Revenues Decrease 10%	10.6%
Project Cost Increase 10%	12.9%

C. Competitiveness

9.05 On the whole, the Romanian bearings industry appears competitively well-placed in its domestic market compared to bearings manufacturers in developed countries. Its basic advantage lies in the very low skilled labor costs in Romania compared to North America and Western Europe (approximately US$0.75 per hour vs. US$8.00). While this wage advantage is partly offset by much lower productivity (para. 5.14), the country still enjoys a significant advantage in total labor costs, particularly considering the total absence of strikes. The Romanian industry also has an important advantage in production planning since production enterprises are given detailed delivery schedules for the full year in advance, facilitating maximum capacity utilization throughout. Thus, despite some inbuilt excess capacity, on balance Romanian production plants can have better capacity utilization. Finally, the almost total absence of local marketing costs should result in considerable savings though the present apparent lack of application engineering does lead to some suboptimum use of bearings. Most of these cost advantages relate to the domestic market and can be realized only if the domestic product mix does not lead to poor equipment utlization (para. 5.13). But, in the competitive export markets, the lower costs alone do not appear adequate to overcome the shortcomings in the marketing effort. To take full advantage of the export potential, the Romanian industry urgently needs to improve its marketing organization as mentioned earlier in para 4.23.

D. Foreign Exchange Savings and Other Economic Benefits

9.06 The project would require a direct foreign exchange investment of about US$38 million and would annually save and/or earn foreign exchange of about US$35 million after project completion. The project would provide about 500 additional direct jobs in the Enterprise and an additional cash flow to the State budget of about Lei 236 million per year after foreign debt service, on an effective total equity investment of about Lei 312 million.

9.07 Under the project the quality of Romanian bearings would be substantially increased, thereby improving the competitiveness of the bearings industry in world markets. Indirectly, it would also improve the quality of machinery, machine tools, automobiles and other industrial goods in which bearings are a small but critical part. The project would also make Romania more self-sufficient in bearings and introduce latest production technology in an important industry, thus meeting two important objectives of Romania's current development plan.

X. AGREEMENTS

10.01 The following major agreements and assurances were obtained from the Government and the Investment Bank:

(a) Investment Bank, as the Borrower, will submit its properly audited financial reports to the Bank in an agreed form and within agreed dates (para. 3.10);

(b) Government will continue to take steps to improve the organizational arrangements for export of bearings to market economies (para. 4.23);

(c) Enterprise will undertake a review by March 31, 1978, of its product mix to establish the economics of adding bearings to its production program with an annual production of about 50,000 or less (para. 5.10);

(d) Enterprise will complete and discuss with the Bank before March 31, 1978, a review to further improve labor productivity, and subsequently take necessary steps to implement its findings (para. 5.12);

(e) Enterprise will create an industrial engineering group and develop programs to improve plant efficiency (para. 5.14);

(f) Brasov plant will comply with satisfactory environmental standards (para. 5.17);

(g) UZINEXPORTIMPORT will play the primary role in the procurement of Bank financed goods and services (paras. 6.03 and 5.14);

(h) BRASOV will complete, before March 31, 1978, a detailed study aimed at reducing its working capital needs (para. 7.04);

(i) Brasov will not make any substantial changes in the equipment, spares and services to be imported without prior agreement of the Bank (para. 7.06);

(j) Government will guarantee project completion and provision of funds to cover cost overruns and financing shortfalls (para. 7.06);

(k) Annual depreciation remittances and benefits of the Enterprise will be sufficient to cover payments of a notional 10% interest rate and principal on the Bank loan (para. 7.07);

(l) Enterprise will submit to the Bank, in an agreed form and within agreed dates, its financial and operating reports, and the Ministry of Finance audit reports (para. 8.10).

10.02 With the above mentioned agreements and assurances, the project provides a satisfactory basis for a loan to the Investment Bank, equivalent to US$38.0 million for 13 years, including 3 years of grace at 8.2% interest.

Industrial Projects Department
May 10, 1977

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JULY 1976

SOCIALIST REPUBLIC OF ROMANIA

LOCATIONS OF MAJOR BEARINGS PLANTS