THE PHILIPPINE CEMENT INDUSTRY

By

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INDUSTRY REFERENCE NOTE

1. *NATURE OF CEMENT*

Cement is used as one of the materials in making concrete buildings, roads, bridges and other structures. It is one of the ingredients of concrete —the others being gravel and sand.

The term *concrete* seems to have been used in Roman times to indicate any bonding agent, and was applied to mortar. Mortar materials may be classified as follows:

1) Common limes
2) Hydraulic limes;
3) Natural cements;
4) Portland cement;
5) Pozzolan cement; and
6) Plasters.

Portland cement is made by heating to incipient vitrification an intimate mixture of limestone and clay or shale. It is generally understood to be a high-grade bonding agent which sets when mixed with water and hardens in air as well as under water.

The name Portland cement was given by Joseph Aspdin in 1824 to a cement that he developed. When hardened, it produced a gray mass resembling in appearance the stone from the famous quarries of Portland, England.

There are five types of Portland cement according to the classification of the American Society for Testing Materials (ASTM). (See Exhibit 1). Type I is for general concrete construction. Type II has a moderate heat of hardening. Type III exhibits high early strength characteristics. Type IV has a low heat of hydration. Type V exhibits high resistance to sulfate action.

For special architectural uses, white Portland cement is produced, differing from regular cement chiefly by its very low content of ferric oxide.

The different types can be made by the same set of machinery. What are required are changes in operating conditions and proportioning of raw materials.

In the Philippines, the cement plants produced practically all Type I Portland cement, because the bulk of the demand was in general construction work.

All locally made cement passed the ASTM specifications in Exhibit 1. However, different brands exceeded the minimum requirements by different amounts. Some companies said that their cement results in a stronger concrete structure. Others said that theirs are more economical to use in hollow block manufacturing. Brands like Apo, Rizal and Republic have been the pioneers and they enjoyed a kind of quality image among some customers. This perceived difference in quality could command a ₱0.05 to ₱0.10 higher retail price/bag of ninety-four lbs. in certain areas of the country.

In big urban areas like the Greater Manila area, buyers were less willing to pay the higher price of the pioneer brands. The big users, like the contractors, gave importance to price, reliability of supply, and credit in making the buying decision. There was a growing feeling among the big users that one brand was just as good as another.

The low value per unit weight of cement makes handling and transportation important considerations in plant location and plant size decisions. In spite of the large economies of scale of cement manufacturing, there would be a point wherein the decrease in the unit production cost would not be sufficient to offset the increase in the transportation cost when the additional production had to be sold in far places.

Bulk transport will be more economical not only from the standpoint of volume, but also from the savings in the paper bag amounting to ₱0.40 each. However, bulk handling will require more elaborate facilities.

In storing cement moisture, control will be an important requisite because the product will harden. The consensus in the industry was that three months will approximately be the maximum storage duration of cement in the Philippines.

2. *HISTORY OF THE CEMENT INDUSTRY IN THE PHILIPPINES*

The Ynchausti firm set up in 1914 in Binangonan, Rizal was the country's first cement plant. The rated capacity was 2,000 bags of 94 lbs./day or 600,000 bags/year of 300 operating days. Soon thereafter, the factory closed shop because of difficulties in producing cement of uniform quality.

In 1921, the Philippine government contracted an American to organize a cement business, which became known as the Cebu Portland Cement Company (CEPOC). Initial operations of the plant in Tina-an, Cebu started in 1924 with a daily capacity of 4,000 bags. Besides having an excellent source of quality raw materials, the plant was situated adjacent to railroad and harbor facilities.

In 1928, Madrigal and Company purchased the Ynchausti plant and after making major repairs resumed operations in 1930. The plant has been called Rizal Cement since then. Except for a break during World War II, production has continued up to the present time.

In 1938, CEPOC increased production to 10,000 bags/day or 3 million bags/year.

During the war, the Japanese ran the CEPOC plant.

In 1946, the industry capacity stood at about 4 million bags/year. At that time, CEPOC and Rizal Cement were the only plants in operation. Shortly thereafter, CEPOC expanded capacity to 20,000 bags/day or 6 million bags/year of 300 operating days.

The postwar rehabilitation required a considerable amount of cement, so that in 1949 consumption reached 10 million bags. The shortage of local supply was made up by importation.

In 1949, import and exchange controls were instituted by the government. This made it difficult to import cement and other construction materials; hence, construction activity was dampened. Industry capacity remained practically at 8 million bags/year up to 1953.

In 1952, a third local plant was established by the Philippine Portland Cement Company at Guimaras Island off Iloilo in Western Visayas. The daily capacity was 2,000 bags.

In 1954, CEPOC inaugurated a new cement plant in Bacnotan, La Union. The capacity was 8,000 bags/day.

While capacity rose from 8 million in 1949 to about 11 million bags in 1954, consumption dropped to about 7.2 million mainly because of exchange controls. At the same time, the local plants seemed unable to operate at higher-capacity utilization because of difficulties in importing spare parts.

In 1956, consumption spurted to 11.3 million, with imports amounting to 1.4 million bags. (See Exhibit 2).

The pent-up demand for cement in 1949 to 1955 was being felt in the rapidly increasing consumption from 1956 to 1961. In this period, Bacnotan Cement Industries, Inc., which bought the CEPOC plant in Bacnotan, La Union, undertook an expansion program. In 1957, Republic Cement started up its 10,000 bags/day plant in Bulacan. The following year, it added 10,000 bags/day to its capacity. In 1960, Universal Cement Company was established. It constructed a 10,000-bag-per-day plant in Northern Cebu using equipment obtained from Japanese reparations. That year, industry capacity stood at 20 million bags/year, whereas consumption was 19 million.

In spite of the surge in demand from 1956 to 1961, the significant expansion of industry capacity, plus importations made by the government enabled supply to cope up with the demand. As a result, prices decreased. (See Exhibit 3). After 1961 and up to 1964, the only expansions were at Rizal Cement (10,000/bags per day) and at Republic Cement (10,000/day). In 1961, decontrol of foreign exchange was instituted by the government resulting in the de facto devaluation of the peso. Importation of cement was significantly reduced and a raise in retail prices followed.

In 1964, Filipinas Cement Company started operations with a 10,000 bags/day capacity. Were it not for the delay in securing the equipment from the Japanese war reparations, start-up could have taken place much earlier. That same year, an ambitious expansion program was launched; and every year thereafter capacity expanded until a 14.4 million bags/year capacity was attained in 1967.

Meanwhile, in 1963, CEPOC sold its plant in Cebu to Apo Cement Corporation, a private firm. This was in line with the government policy of withdrawing from businesses that the private sector could handle.

Exhibit 4 shows that the 1964-1965 projections of industry capacity for the years 1965 through 1968 were consistently above the actual. On the other hand, the Cement Association of the Philippines (CAP) had been projecting a pessimistic demand, and an optimistic supply situation. In effect, it had been predicting a glut situation. Industrialists were therefore hesitant to enter the industry.

During 1964 and 1965, while the CAP had been predicting a glut, existing cement companies were making considerable profits. Prices remained high. Many of these companies were either carrying out or starting their own expansions. The only newcomer in 1966 was Mindanao Cement, a new plant that went through considerable technical difficulties that delayed start-up.

In 1964, the start-up in 1966 of four newcomers: Marinduque, Pacific, Luzon and San Jose was projected. Yet in 1966, these plants were not operating. They were having difficulty negotiating for the equipment. Except for Marinduque, which was a going mining concern that was diversifying into cement, these companies had very little equity (20% of total assets). Buildings, equipment and installation were often financed by loans. Supplier loans on equipment had to be guaranteed most of the time by government financial institutions. And further delays were often encountered.

Meanwhile, the existing cement plants continued to make high profits. As a result, more newcomers came in. They started negotiating for the equipment and its financing. HI Cement, Diamond Cement, Tayabas Cement and many more came into the picture. It was possible that the newcomers stopped believing the projection of oversupply. The tight supply situation then existing was also reinforced by the industry capacity uitlization of about 80% largely because of production problems.

The consequence was that as the tight supply situation persisted, more plants were planned. And because of the difficulty and the delays

in starting up new capacity installations, increased supply was slow in coming. Meanwhile, the amount of new capacity under construction grew.

Some firms, such as Diamond Cement, backed out. And as supply started to catch up, more firms wanted to back out, but it was too late. Once the letter of credit for the equipment was opened, it was very difficult to discontinue.

In 1964 to 1966, it was difficult to predict the future industry capacity, because many cement companies were being organized. (See Exhibit 5). Some were serious in putting up a plant, whereas others did not appear to be. The weak technical and financial capabilities of most newcomers contributed to the uncertainty.

Although Exhibit 5 refers to the situation in 1968, many of the names under proposed cement plants have appeared since 1965. Notice also that only five of the proposed plants in 1965 were operating in 1968.

In 1964, a number of American firms, notably Lone Star and Koppers, were interested in establishing cement operations in the country. However, they met strong opposition from existing firms. The latter claimed that the industry had been pioneered and developed by Filipinos, so that it was unfair to allow foreign firms to come in at that stage. Many felt that foreigners should pioneer into new industries. The National Economic Council (NEC), after a series of hearings, passed Resolution No. 77, which discouraged foreign firms from entering the cement industry. Although Lone Star and Koppers could have insisted in coming in, they decided not to.

In early 1969, there were thirteen cement plants in operation. (See Exhibit 5). The installed capacity of these plants was about 85 million bags/year. However, on the assumption of 85% utilization on account of operational problems, the supply would be 72 million bags. Iligan Cement was expected to start-up in late 1969 and Northern Cement in early 1970. Marinduque was expected to double its capacity to 18 million bags in early 1970; and Universal to more than double to 15 million. On the other hand, the proposed expansion of Filipinas Cement in 1970

was set back. In the final analysis, the delays in the negotiation for financing and in the construction of the plant will determine the actual balance of supply and demand beyond 1969. Other than those already in the final negotiation stage and in the construction stage, no new plant or expansion of an existing plant was expected until the mid-1970s.

3. *AVAILABILITY OF RAW MATERIALS*

Limestone and clay (or shale) deposits were found in large quantities in most parts of the country. The proved reserves of most plants were said to be from 50 to 100 years at current capacity. Because of the plentiful supply, plant location was dictated less by raw material consideration but by the market location. However, a few plants have been located in places where a major stockholder owned large deposits of raw material. In such situations some attempts were made to establish that the nearby market was satisfactory, though not optimal.

4. *SUPPLY OF PLANT EQUIPMENT*

During the postwar period, Japan and Germany have supplied most of the plant machinery. The principal reason for their dominance appeared to be the low price and the liberal terms of payment, normally calling for a 10% down payment and the balance in ten years. Interest had been about 6 to 8%.

The indebtedness for the equipment has been guaranteed by local banks, particularly the DBP. A guarantee fee of 11½% p.a. was charged on the outstanding balance of the amount covered by the guarantee.

Some Japanese suppliers granted construction loans that were used in the construction of the civil works and buildings. The terms were about 8% interest over a five-year period.

Other plants were purchased on a turnkey basis, that is, the company will get the plant after it had been start-up. Turnkey projects were favored by financial institutions because of the reduced probability of delays that will strain the company's cash position.

Although the supplier could design and make a plant of any reasonable size, he will usually have standard sizes to offer. Standard sizes differed from one supplier to another. And suppliers encouraged customers to buy the standard sizes and also the bigger ones.

5. *TRENDS IN PLANT SIZE SELECTION AND MANUFACTURING TECHNOLOGY*

In the 1950's a plant size of 10,000 bags/day (3 million bags/year) was considered the economic plant size. In the early 1960's, the generally accepted minimum economic plant size became 20,000 bags/day. The reasons given was the reduction in the total production cost per bag, assuming full-capacity utilization. There was also a growing confidence among Filipino industrialists in being able to operate bigger plants.

The trend has been towards a bigger plant size. Many plants established after 1965 had capacities in the neighborhood of 30,000 bags/day. In 1968, a plant with a kiln capacity of 50,000 bags/day was constructed.

There was no evidence that the choice of size considered thoroughly the balance between economies of scale and transport cost. At the time most plants were planned, there was an undersupply situation so that every additional capacity appeared to contribute to profits.

The more recent plants had more sophisticated control equipment. They required less people. In fact, the trend has been towards having a central control room from which the whole plant could be run. There has also been more dust control equipment.

Since the Philippines bought the cement plants from advanced countries like Japan and Germany, the tendency was to adopt the same type of equipment in use in these countries.

6. *NATURE OF THE MARKET*

The market for cement was highly dependent on the construction industry, which was in turn very sensitive to the credit situation and government policies on public construction. Credit was dependent on Central Bank (CB) policies as well as those of the Government Service In-

surance System (GSIS), the Philippine National Bank (PNB) and the DBP—all government institutions. For example, because of tight credit, private construction in 1968 dropped from ₱562 to ₱444 million.

A. Market Segmentation

The cement market might be divided into domestic and export. The former in turn might be divided into the government sector and the private sector.

The private sector was composed of the residential and the nonresidential segments of the market. In residential construction, concrete and hollow blocks have been increasingly the favorite materials.

The figures below indicate that the demand for cement in residential construction increased from 7 million bags in 1960 to 13.3 million in 1965. However, its share of the market declined from 47.1 to 40.9%.

Cement Consumption

	Percentage to Total Final Demand		Final Demand in Million Bags	
	1960	*1965*	*1960*	*1965*
Private				
—Residential	47.1	40.9	7.0	13.3
—Nonresidential	40.8	33.9	6.1	11.6
	87.9	74.8	13.1	24.9
Government	12.1	25.2	1.8	8.2
Total	100.	100.	14.9	33.1

In 1966, a study by the Private Development Corporation of the Philippines (PDCP) indicated that by 1980 the demand by nonresidential construction was expected to exceed that of residential.

Nonresidential (commercial-industrial) construction has been concentrated in the Greater Manila area, principally Makati and Quezon City. So far, concrete, rather than structural, steel has been the favorite material. The reasons were that concrete structures were cheaper up to

about fifteen stories high, cement and reinforcing bars were locally available; whereas structural steel had to be imported, and that concrete structures needed less skilled labor. On the other hand, a structural steel building was faster to construct.

The architect with the approval of the owner normally decided whether or not to use concrete structures. The contractor usually determined the brand of material to use and from whom to buy.

The key elements in selling cement to a contractor were price, reliability of supply, and credit terms. Since all brands passed the ASTM standards, few contractors gave preference to a single brand on the basis of quality.

The intermediate demand for cement consisted of manufacturers of concrete hollow blocks, prestressed and precast concrete and other concrete products. These manufacturers bought in bulk and their demand has been rising.

The government sector consisted of cement needs for highways, ports, airports, national buildings, community development, etc. Most of the funding came from the national government; hence, it was highly sensitive to budgetary limitations and government priorities. A recent development in funding was to let private firms look for the financing, say abroad, and the government would then guarantee the loan. When the project would be finished, the private firm would collect tools to pay for the funds borrowed and to cover profits.

In the second half of the 1960's, a vigorous infrastructure program was pursued by the government, resulting in a tremendous increase in cement consumption by the public sector.

Several countries in Southeast Asia have been importers of cement. (See Exhibits 6 and 7). It appeared that because of the location of the Philippines relative to the importing countries, only Indonesia and South Vietnam presented really attractive export possibilities. In fact, some companies, with the help of the CAP, have started to export to Saigon and Indonesia in 1969.

Although Malaysia is near the Philippines, it had strained diplomatic relations with the latter; hence, trade could not be expected to be satisfactory.

The CAP launched an export program in 1969. It made a study on export possibilities and submitted bids to supply cement to foreign countries. It represented the cement companies in requesting for government export subsidies and tax relief.

In June 1969, a plan to organize a cement exporting firm was announced by the CAP. The said firm was supposed to do the exporting for the industry. Also envisioned was a mechanized loading terminal at the Manila South Harbor.

Cooperation of all cement companies will be crucial in the above plan. Since export prices were expected to be lower than domestic prices, there will be a temptation to allocate only a small amount of a firm's output for export.

A study by CAP showed that ex-plant price had to be ₱1.67/bag of ninety-four lbs. in order to compete with Japan, Taiwan and South Korea. This will be equivalent to ₱2.67/bag after adding the ₱1.00/bag of export incentives granted by the Board of Investments (BOI).

Sources close to the CAP disclosed a plan to export 5 million bags in 1969 and 40 million in 1970. Based on the progress as of October 1969, it was doubtful whether these quantities could be attained.

Exhibit 8 shows past and projected figures of consumption in the various market segments.

B. Regional Nature of the Market

Cement has a low value per unit weight, so that transportation over long distances will be difficult and costly. In the Philippines, this reality was compounded by the inefficient, and hence, costly transportation system. (See Exhibits 9 and 10). Most roads were not well paved; interisland ships were of World War II vintage. There was very little bulk-handling facilities. Such a situation suggested a regional orientation of the market

Although the Ilocos Region is geographically near the Cagayan Valley, the two will not constitute an economic unit because of the high cost of transportation between them. Central Luzon will make a natural pair with either the Ilocos Region or the Cagayan Valley, because transportation was less costly between the former and either of the latter two regions.

Southwestern Mindanao was a relatively isolated region from the other areas because of the costly transportation. Hence, the Bacnotan plant in Davao had a regional supremacy in the area.

C. Composition From Other Materials

Concrete and hollow blocks have been increasingly the favorite materials in residential construction. One reason was that prices of wood have steadily risen, whereas the price of cement has declined. Another reason was that concrete was much easier to maintain than wood. The rising income of many families, including those in the farm, enabled people to construct more permanent structures instead of makeshift houses.

One factor that might prove a boon to housing was the government policy of encouraging low-cost housing. The National Housing Corporation (NHC) was set up for this purpose. The estimated cement requirements of this government firm must have been large, because there was talk of putting a cement plant to supply the firm with cement.

Some insurance companies and savings banks have put up housing projects for their middle-income clients.

The growing popularity of cement in commercial and industrial construction might be challenged by structural steel with the start-up in 1969 of Iligan Integrated Steel Mill (IISM). The problem of importation shall have been eliminated, and the price of structural steel might be reduced.

Plastics was not likely to become a threat to cement as a building material because of price, and the unfamiliarity of the people with the material.

The use of prestressed and ordinary precast concrete has been very limited—confined largely to recently constructed bridges such as the ones along the North Diversion Road. The reason was the reluctance of architects, building owners and government building inspectors to try more sophisticated technology because of the fear that the structure might collapse. So far, only the manufacturers have been pushing for their market acceptance.

The use of transit mix among contractors has become more widespread. For large projects, it has proven to be more economical than on-site mixing; and it has enabled construction to go on during the rainy season. This was so because mixing would be done indoors in the batching plant.

D. Pricing

Exhibit 5 shows the average retail prices from year to year. People in the industry felt that price was highly sensitive to the balance between supply and consumption, because cement is an undifferentiated product and because of the high plant investment that will exert pressure to keep the plant running. A study by the Economic Development Foundation (EDF) in 1969 revealed that price was highly correlated with the ratio of consumption over industry production capacity. As a result, ex-plant price very much below that prevailing in 1969 might become a reality unless there would be significant exports. (See Exhibit 11).

In the past, cement was priced at what the market could bear. For example, price in the north was based on price in Manila (where many plants were located), plus transportation cost from Manila even if the cement came from the Bacnotan plant in the north. For Visayas and Mindanao, the basing point was Cebu where two plants were located. Sometimes, Manila would be used as the basing point.

When the buyer's market started, price-cutting also started. This time, prices seemed to be determined by the production cost. High-cost producers felt the pressure to match the price of the more efficient plants, even if it meant sustaining a loss. The alternative was to shutdown. Being a capital intensive business, a shutdown could be more expensive.

The bigger plants felt that because of economies of scale, they could afford to underprice the others, and hence, get a bigger share of the market, which was necessary to achieve high capacity utilization. Since the other plants would rather match the low price than shutdown, the bigger plants could not increase their share of the market. At low-capacity utilization, they could not achieve the economies of scale.

The forecast of national demand that most firms use was the World Bank (WB) forecast (sometimes referred to as the Robuck forecast) of Philippine cement consumption. This was an extrapolation of a growth trend of about 15% annually. Up to 1969, actual consumption has been close to the forecast since recent consumption has been at prices lower than those prevailing at the time the forecast was made, cement demand might not be as elastic as some cement companies thought. Many contractors and management consultants tended to agree with this observation.

7. *GOVERNMENT POLICY*

In the years 1965 through 1968, a more aggressive infrastructure program was pursued by the government. There was also a strong preference by the government for cement in highway construction. In 1966, 127 kilometers of concrete-paved roads were laid out. The following year the figure rose to 380 and in the first half of 1968, 281 kilometers were completed.[1] Construction of permanent concrete bridges was also accelerated.

For fiscal years 1967-1970, a total public works investment of ₱3.09 billion was programmed.

In terms of financial assistance from the government, the DBP and the National Industrial Development Corporation (NIDC) have extended guarantees to the mortgages on machinery obtained from foreign suppliers. In addition these government institutions, together with the Government Service Insurance System (GSIS), have subscribed to the preferred shares of several newly established cement firms.

[1] *The Manila Times,* 24 August 1968.

Some firms acquired their plant machinery from the Japanese war reparations. Japan supplied these equipment as part of her reparations payment to the Philippine government. The cement company in turn became obligated to the government.

About the middle of 1968, the DBP, which made the bulk of the foreign loan guarantees, stopped accepting applications for new cement plant financing. It felt that there was already enough capacity in the industry for the next few years.

Prior to the establishment of the BOI in 1968, government lending institutions were guided by the investment priorities set up by the CB and the NEC. These priorities were in accordance with the economic plans of the government. Up to 1967, cement manufacturing was encouraged by the government. Project viability was another criterion followed by government lending institutions.

Before 1968, several firms were able to get government financial assistance. The record thus far indicated that the government tends to be late in discouraging new industries to an industry. The Investment Incentives Law of 1967 sought to minimize the chance of industry over capacity by giving incentives in areas where there is undercapacity and disincentives for entry in industries where there is overcapacity.

In 1969, the BOI awarded export incentives to the cement industry in the amount of ₱1/bag. Such amount was in the form of the following:

a. Double deduction of promotional expense;

b. Double deduction of shipping costs on Philippine vessels—150% of shipping costs on foreign vessels;

c. Special tax credit on raw materials; and

d. Accelerated depreciation.

8. *DISTRIBUTION*

The marketing method varied among cement companies. Exclusive distributors such as Amon Trading, Theo H. Davies, Filipinas Marketing,

Apo Cement Marketing, Luzon Commodities Corporation (LCC) were practically owned by the owners of the cement plants. One advantage of having a marketing company and a manufacturing company was the savings in income tax because of the lower tax bracket each will be in than in the case of a consolidated company. Specialization of function may be another advantage. By controlling the transfer price, the profit could be made in either company depending on the wish of the owners. This situation could be a disadvantage to the small stockholders who owned stocks in only one company.

In a study by one cement firm in 1966, the percentage of total bags that reached the contractors was estimated to be 41%. The figures were 24% to the government, 23% to owners of private houses and 12% to the processors.

Based on the prices prevailing in June of 1967, the mark-up at the different levels in the distribution system were approximately as follows:

	Mark-up
Distributor	9%
Wholesaler	9
Retailer	5

The distributor got the cement ex-plant and delivered it to the wholesaler. The wholesaler in turn would make the delivery to the retailer. In cases where the wholesaler got the cement from the distributor's warehouse, a transportation allowance would be given him, thereby increasing the wholesaler's mark-up. There were a number of wholesalers who performed the logistics function from the distributor's warehouse to the retailer. They would carry inventory. They owned delivery trucks. When the trucks were not used to deliver cement, they were used to haul other commodities.

Some distributors had regional warehouses in order to facilitate distribution. With increasing competition, the trend seemed to be for more regional warehouses.

For interisland transportation, barges were more economical than interisland shipping—about 50% less expensive.

Companies like Universal Cement and Pacific Cement used a lot of barge transportation. The former owned many of the barges used, whereas the latter leased them.

The retailers consisted of hardware stores, construction supply stores —including sand and gravel dealers. They carried very little inventory, and they usually sold on cash. Many carried competing brands.

The main function of the retailer was to keep cement available to consumers when needed. There was practically no sales talk nor point-of-sale advertising.

During the seller's market, cement companies sold a big portion of their output on a cash basis. Some even required advance payment. However, starting late 1968, industry supply started to catch up with demand and credit became an instrument for making a sale. In 1969, credit sales of up to ninety days had become common; and many companies felt the strain on their cash flow.

Sales to large contractors and processors were usually done on a negotiated price basis. And whenever possible, bulk deliveries were made. In June of 1967, when the average retail price was about ₱4.35/bag, the price given to these big users was in the range of ₱3.50 to ₱4.00, which was about the price given to distributors.

9. *COST STRUCTURE*

The nature of the cement business was such that many of the costs were fixed. These were depreciation, interest on long-term loans, maintenance, salaries and wages and insurance. The variable costs were the paper bag, gypsum and to some extent—power. Exhibit 12 shows the relative magnitude of variable production cost; fixed cost, exclusive finance charges; and finance charges. The same exhibit also shows the prices of the different sizes of plant machinery.

Among the variable costs, fuel and paper bag were the large items. The former ranged from ₱0.30 to ₱0.60/bag, depending on the type, and operating efficiency. Paper bags cost about ₱0.40 each.

Exhibit 13 shows the investment cost per unit of capacity among plants of different sizes and in different countries. The relatively low investment per ton of capacity in the Philippines was believed to be caused by lower construction cost and less sophisticated equipment.

10. *FINANCIAL PICTURE OF THE INDUSTRY*

Exhibit 14 shows both the profitability and the financial structure of the industry. Years 1966 through 1968 were profitable with Republic showing the most profitable performance. Its long experience in the business and its two strong distributors—Amon Trading and Theo H. Davies, were some of the reasons for the good record.

Exhibit 14 shows growth in sales, profits and assets of the six companies represented. In 1968 equity was only 40% of total liabilities, an indication of the very high leverage situation. Current liabilities exceeded current assets. Companies not represented in the exhibit, except for Rizal Cement, were likely to be more leveraged and cash-short.

The 1967-1968 *Annual Report* of the CAP indicated that by 1970, total investment in cement plants will reach ₱1 billion.

A very significant portion of the industry's long-term debt was from government financial institutions—mostly in the form of foreign supplier loan guarantees.

11. *PROBLEMS OF THE INDUSTRY*

The biggest problem facing the industry in 1969 was the overcapacity situation. Price-cutting has brought down ex-plant prices from ₱4 two years ago to less than ₱3. Industry observers believed that price will go down some more in a year or two, unless the government steps up its infrastructure program or exports accelerate.

In July of 1970, the glut situation appeared to deteriorate further. The retail price in the Manila area ranging from ₱2.80 to ₱3.10/94 lb. bag meant an ex-plant price of about ₱2.50, a figure significantly below full cost at the prevailing capacity utilization. Demand appeared to have slackened because of the tight money situation and the reduced public

works expenditures. The estimated local consumption ranged from 69 to 82 million bags for 1970, whereas the estimated industry capacity stood at 124 million bags/year. Adding the capacity of the four projects still in the construction stage, the total industry capacity will be about 160 million bags/year. Assuming the past growth rate of consumption of about 15%, full industry capacity utilization might be expected in 1975, neglecting exports.

The floating rate, which devalued the peso vis-a-vis the US dollar by 50%, has worsened the problem of foreign debt service. In addition, the cost of paper bags, fuel, power and wages rose by 30 to 50%.

12. *CONCLUSIONS*

1. In future capacity decisions, the importance of estimating industry capacity utilization should be realized. The estimate would be the basis of price and sales volume forecasts. As experienced lately, price seems to be highly sensitive to industry capacity utilization. Intuitively, price can be as low as the variable cost and as high as the market will bear.
2. The regional nature of the cement market has implications to the plant location and to the preparation of feasibility studies. If a plant is intended to serve several regional marktes, the forecast of price and of sales orders should be done for each region. Transport cost should then be accounted for in computing profitability.
3. Unless a cement company is just breaking into the market, initiating a price reduction does not seem appropriate. While such action might momentarily increase the sales volume, competition would be likely to match the lower price (and it makes sense to match the lower price) because of the high fixed cost of cement operation, and the undifferentiated nature of cement. Since cement demand does not appear to be highly price-elastic, each firm is likely to end up with its previous sales volume (or slightly higher) but at a lower price.
4. Export appears to be a promising alternative. First, in a glut situation, an export price (ex-plant) above variable cost will re-

sult in a contribution to fixed cost. Second, the consequent reduction in the local supply will mean less downward pressure on the domestic price. Domestic price might even rise. Third, since cement is a cyclical industry, industry overcapacity is likely to recur in the future. Therefore, any export expertise developed now is likely to be useful in the future.

If the export incentive of about ₱1/bag or more were considered, export appears to make a lot of sense at prices below $12.00/ton f.o.b Philippine port ($0.60/50 kg. bag). It will be especially so for firms having other profitable divisions, because the incentive is in the form of a reduction to the taxable income.

5. Cooperation among companies in their export efforts appears to make sense. Specifically, they might decide to export from a plant near a port, so that handling expense could be reduced. Having a single organization handle the export for the industry might result in more efficiency. This idea has been discussed by the cement firms since 1969; however, no visible progress has resulted because of distrust and the difference in goals of each firm. The DBP seems to be the only entity potentially capable of persuading firms to cooperate because of the financial lever that it can pull.

   In this regard, it would seem more appropriate to focus "cooperation" on export activity rather than the domestic market. Exports will bring in foreign exchange and will tend to improve the local supply-demand situation automatically. If "cooperation" is focused on the domestic market by limiting production to achieve at least breakdown operation, the pressure to export will decrease. Also, the domestic price might be too high such that public opinion might be aroused. Who knows what the consequence will be? Business firms need to be sensitive to their environment.

6. The cement industry seemed to be highly dependent on the government. Public works expenditures and government credit policies determine to a very significant degree the level of cons-

truction activity. On the supply side, government guarantee to equipment loans indirectly placed in government hands the decision as to level of industry capacity at any given time. Finally, the export incentives helped the cement firms compete in the export market.

Whether the government liked it or not, its policies had a tremendous effect on the health of the industry. This implied the need to formulate and implement such policies more sensibly in order to achieve better allocation and utilization of the country's resources.

Unlike the situation in 1964-1966, where there were many announcements of expansion and new plant construction, there was more certainty in 1969 as to the future additions to industry capacity. It appeared that only plants actually under construction would come in. The others that could still back out have already done so.

The other problem was the heavy debt saddling the industry. Many of the plants were new and the amortization schedules were heavy, yet the prevailing prices could not provide sufficient cash flow.

In spite of the talks and plans on industry-coordinated exports, nothing tangible has been done so far. Except for a 100,000-ton sale made to Vietnam in 1969, there has been nothing significant yet organized to do export promotions, solicitation of orders, export financing and efficient delivery.

EXHIBIT 1

ASTM SPECIFICATIONS OF PORTLAND CEMENT

	TYPE				
	I	III	II	IV	V
The compressive strength of mortar cubes composed of 1 part cement and 2.75 graded standard sand, by weight, prepared and tested in accordance with a standard method shall be greater than or equal to the values specified below:					
1 day in moist air	–	–	1,250 psi	–	–
1 day in moist air and 2 days in water	900 psi	750	2,500	–	–
1 day in moist air and 6 days in water	1,800	1,500	–	800	1,000
1 day in moist air and 27 days in water	3,000	3,000	–	2,000	2,200
Tensile strength of mortar briquets composed of 1 part cement and 3 parts standard sand, by weight, prepared and tested by a standard method shall have values of the following:					
1 day in moist air	–	–	275 psi	–	–
1 day in moist air and 2 days in water	150	125	375	–	–
1 day in moist air and 6 days in water	275	200	–	175	175
1 day in moist air and 27 days in water	350	325	–	300	300

Source: American Society of Testing Materials (ASTM).

EXHIBIT 2

CEMENT PRODUCTION AND CONSUMPTION
(In 94-lb. Bags)

YEAR	PRODUCTION	CONSUMPTION
1946	1,341,794	1,241,058
1947	3,140,548	3,908,919
1948	2,843,487	7,330,095
1949	5,553,847	9,500,837
1950	6,997,229	7,937,812
1951	7,394,484	6,145,713
1952	7,516,131	6,005,380
1953	7,475,856	6,686,523
1954	7,713,822	6,332,545
1955	9,501,325	7,238,625
1956	10,443,633	11,386,327
1957	12,524,504	15,867,870
1958	15,303,067	15,622,613
1959	17,988,693	18,074,160
1960	18,948,693	18,994,831
1961	23,943,427	23,888,646
1962	22,653,605	22,586,201
1963	23,480,735	27,532,871
1964	29,199,856	32,542,769
1965	35,712,681	37,315,145
1966	39,363,917	39,710,724
1967	49,747,083	52,863,657
1968	30,408,722*	32,454,095*

* Figures from January to June, 1968.

EXHIBIT 3

CEMENT SALES, IMPORTATION AND STOCKS
(Cement and Clinker)
(In 94-lb. Bags)

YEAR	SALES	IMPORTATION	STOCKS
1946	973,319	267,739	
1947	3,055,897	585,283	
1948	5,106,576	2,200,519	
1949	6,834,854	2,665,983	
1950	6,339,711	1,598,101	
1951	5,853,092	292,621	
1952	5,549,150	456,230	
1953	6,006,484	680,039	
1954	4,695,378	1,637,167	
1955	6,409,076	829,549	
1956	9,989,390	1,396,937	
1957	12,386,822	3,481,048	
1958	14,985,702	636,911	
1959	17,040,099	1,034,061	1,676,362
1960	18,966,078	28,753	2,186,804
1961	23,873,609	15,037	489,199
1962	22,534,588	51,613	397,553
1963	22,522,151	5,010,720	551,211
1964	28,163,364	4,379,405	2,281,197
1965	35,479,241	1,835,904	2,856,517
1966	37,871,982	1,838,742	1,923,777
1967	47,808,402	5,055,255	3,214,282
1968	30,557,842*	1,896,253*	1,716,432*

* Figures from January to June, 1968.

EXHIBIT 4

PROJECTIONS OF INDUSTRY CAPACITY

1965	*Actual*	*1964 Projection for 1965*
Rizal	–8.4 million bags	8.4
APOCEMCO	–4.2 " "	4.2
Phil. Portland	–0.72 " "	0.72
Bacnotan	–6.0 " "	6.0
Republic	–9.0 " "	9.0
Universal	–3.0 " "	4.5
Filipinas	–3.0 " "	4.8
Mindanao	–	2.0
	36.1	39.1
Projection over actual = 108%		

1966	*Actual*	*1964 Projection for 1966*
Rizal	–8.4	8.4
APO	–3.6	4.8
Phil. Portland	– .72	.72
Bacnotan	–6.0	6.0
Republic	–9	10.5 (portion of 6 million)
Universal	–6.0	6.0
Filipinas	–6.0	12.0
Mindanao	–3.6	3.6
Luzon	–	2.0
San Jose	–	1.5
	43.3	59.0
Projection over actual = 136%		

1967	*Actual*	*1964 Projection for 1967*
Rizal	–8.4	8.4
APO	–3.0	4.5
Phil. Portland	–0.72	0.72
Bacnotan	–6.0	6.0
Republic	–9.0	15.0
Universal	–6.0	6.0
Filipinas	14.4	14.4
Mindanao	–3.6	4.0

Marinduque	–9.0	9.0
Pacific	–4.2	3.0
HI	–9.0	–
Luzon	–	3.5
San Jose	–	3.0
Diamond	–	10.5
Tayabas	–	4.2
Bacnotan No. 2	–	3
	73.3	95.2

Projection over actual = 130%

1968	*Actual*	*1965 Projection for 1968*
Rizal	–8.4	18.0
APO	–4.0	8.0
Phil. Portland	–0.72	0.72
Bacnotan	–6.0	6.0
Republic	15.0	15.0
Universal	–6.0	6.0
Filipinas	14.4	14.4
Mindanao	–3.6	3.6
Marinduque	–9.0	9.0
Pacific	–4.2	4.2
HI	–	9.0
Luzon	–	3.5
San Jose	–	3.0
Diamond	–	10.5
Tayabas	–	4.2
Bacnotan No. 2	–3	3
Continental	–	6
	83.3	114.1

Projection over actual = 137%

Source: *CAP Annual Reports.*

EXHIBIT 5

PROJECTED AND ACTUAL PRODUCTION OF OPERATING AND PROPOSED CEMENT PLANTS
(In Million Bags)

Names of Companies	Plant Sites	Rated Capacity (Present)	Actual Production		Projected Production						Proposed Expansion Production
			1967	1968	1969	1970	1971	1972	1973	1974	
A. *Operating Plants*											
1. Bacnotan	Bacnotan, La Union	6.00 (Wet)	6.835	6.597	6.00	6.00	6.00	6.00	6.00	6.00	12 Oct. 1964
2. Republic	Norzagaray, Bulacan	15.00 (Dry)	8.042	11.007	15.00	15.00	15.00	15.00	15.00	15.00	1 Apr. '68
3. Rizal	Binañgonan, Rizal	8.40 (Wet)	7.949	7.365	8.40	8.40	8.40	8.40	8.40	8.40	1 July '66
4. Phil. Portland	Guimaras Island, Iloilo	0.72 (Wet)	0.466	0.413	0.72	0.72	7.80	7.80	7.80	7.80	1 Jan. '71
5. Universal	Davao City	6.00 (Dry)	4.731	5.295	6.00	15.00	15.00	15.00	15.00	15.00	1 Jan. '70
6. Apocemco	Naga City, Cebu	3.00 (Wet)	2.772	2.883	3.75	6.00	8.25	15.00	15.00	15.00	1 Oct. '71
7. Filipinas	Teresa, Rizal	13.60 (Dry)	9.595	10.087	13.20	13.20	18.60	24.00	24.00	24.00	1 July '71
8. Mindanao	Iligan City	3.60 (Dry)	2.192	3.540	3.60	3.60	3.60	3.60	3.60	3.60	18 Nov. '65
9. Marinduque	Antipolo, Rizal	9.00 (Wet)	5.587	7.381	11.25	18.00	18.00	18.00	18.00	18.00	1 Oct. '69
10. Pacific	Surigao del Norte	4.20 (Wet)	1.578	3.501	4.20	4.20	4.20	4.20	4.20	4.20	1 June '67
11. Hicement	Norzagaray, Bulacan	9.00 (Dry)	–	2.985	9.00	9.00	9.00	9.00	9.00	9.00	1 May '68
12. Bacnotan No. 2	Davao City	3.00 (Wet)	–	.483	3.00	3.00	6.00	9.00	9.00	9.00	1 July '71
13. Luzon	San Ildefonso, Bulacan	3.60 (Dry)	–	.094	3.60	3.60	3.60	3.60	3.60	3.60	1 Dec. '68
TOTAL PRODUCTION IN BAGS		84.72	49.747	61.631	87.72	105.72	123.45	138.60	138.60	138.60	

B. *Plants Under Construction*:

1. Iligan	Iligan City	720 (Dry)		1.80	7.20	7.20	7.20	7.20	7.20	1 Oct.	1969
2. Northern	Sison, Pangasinan	15.00 (Dry)		–	11.25	15.00	15.00	15.00	15.00	1 Apr.	'70
3. Midland (Quezon)	Tanay, Rizal	10.50 (Dry)		–	–	10.50	10.50	10.50	10.50	Jan.	'71
4. Fortune	Taysan, Batangas	9.00 (Dry)		–	–	9.00	9.00	9.00	9.00	Jan.	'71
5. Floro	Lugsit, Misamis Or.	10.80 (Dry)		–	–	5.40	10.80	10.80	10.80	July	'71
6. Continental	Norzagaray, Bulacan	8.64 (Dry)		–	–	4.32	8.64	8.64	8.64	1 July	'71
	TOTAL	61.14		1.80	18.45	41.42	61.14	61.14	61.14		

C. *Projects In Advanced Stage of Negotiation or Financing:*

1. Builder	Samboan, Cebu	9.00 (Dry)					4.50	9.00	9.00	1 July	1972
2. Tayabas	Padre Burgos, Quezon	4.20 (Dry)					2.10	4.20	4.20	1 July	'72
3. Mabuhay	Montalban, Rizal	9.00 (Dry)					–	4.50	9.00	1 July	'73
	TOTAL	22.20					6.60	17.70	22.20		
TOTAL PRODUCTION CAPACITY			49.747	61.631	89.52	124.17	174.87	206.34	217.44	221.94	

EXHIBIT 6

CEMENT IMPORTS BY SOUTHEAST ASIAN COUNTRIES 1960-1964 (Million Bags)

	1960	*1961*	*1962*	*1963*	*1964*
BURMA					
Production	1.04	0.92	1.24	2.28	2.68
Consumption	3.36	3.36	4.20	2.80	2.80
(Net imports)/Surplus	(2.32)	(2.44)	(2.96)	0.08	0.12
CEYLON					
Production	2.04	1.92	2.00	1.84	1.80
Consumption	5.88	7.04	7.04	6.48	5.88
(Net imports)	(3.84)	(5.12)	(5.04)	(4.64)	(4.08)
HONGKONG					
Production	3.52	4.32	4.96	5.04	5.24
Consumption	12.08	12.64	17.68	23.88	28.36
(Net imports)	(8.56)	(8.32)	(12.72)	(18.84)	(23.12)
INDONESIA					
Production	9.08	10.40	11.96	n.a.	n.a.
Consumption	10.96	18.52	14.88	14.60	n.a.
Net imports	(1.88)	(8.12)	(2.92)	n.a.	n.a.
MALAYSIA AND SINGAPORE					
Production	6.72	7.76	7.76	8.44	8.52
Consumption	9.12	14.32	18.24	20.52	18.80
Net imports	(2.40)	(6.56)	(10.64)	(12.08)	(10.28)
SOUTH VIETNAM					
Consumption	7.04	8.72	9.28	9.28	n.a.
(Net imports)	(7.04)	(8.72)	(9.28)	(9.28)	n.a.

Source: Economic Commission for Asia and the Far East (ECAFE).

EXHIBIT 7

IMPORT POTENTIALS OF SEA COUNTRIES (Million Bags)

	1969	*1970*	*1971*	*1972*	*1973*	*1974*
Ceylon	2.3	2.8	3.2	3.8	4.3	4.8
Cambodia	2.7	2.8	2.7	2.6	2.5	2.4
Hongkong	37	39	42	44	46	49
Indonesia	6.4	7.4	6.8	0.6	–	0.8
Singapore	11.8	12.3	12.9	13.4	14	14.5
South Vietnam	11.8	13.0	14.4	15.6	16.9	18

Source: EDF.

EXHIBIT 8

DEMAND FOR AND SUPPLY OF PORTLAND CEMENT COMMODITY BALANCE AS PROJECTED FOR 1970, 1975 AND 1980

(In Thousand Bags)

I. DEMAND	*Actual*		*Projected*		
	1960	*1965*	*1970*	*1975*	*1980*
A. *Final demand*					
1. Residential dwellings	7,016	13,296	19,799	26,666	35,791
2. Nonresidential Buildings	6,084	11,042	16,515	24,759	37,180
3. Government	1,802	8,209	13,138	18,274	24,694
4. Export	[2]	[2]	12,312	9,234	15,666
5. Additions to inventory	[3]	[3]	221	331	1,105
Total final demand	14,902	32,547	61,985	79,264	114,436
B. *Intermediate demand*					
1. Concrete hollow blocks	1,139	1,458	1,809	2,346	3,098
2. Prestressed, Precast and other concrete products	2,954	3,310	3,702	4,294	5,186
Total intermediate demand	4,093	4,768	5,511	6,640	8,284
TOTAL DEMAND	18,995	37,315	67,496	85,904	122,720
II. SUPPLY					
A. Local production	18,966[4]	35,479[4]	67,496	85,904	122,720
B. Importation	29	1,836	–	–	–
TOTAL SUPPLY	18,995	37,315	67,496	85,904	122,720

[1] Actual demand is taken as total sales of the industry plus imports.
[2] No recorded exports for these years.
[3] Not included since actual consumption is taken as total sales plus imports.
[4] Represents the total sales of the industry and not total production. Total production for 1960 is 18,949,000 bags and 35,713,000 for 1965.

EXHIBIT 9
SHIPPING METHODS AND COSTS

Cement is transported either in 94-lb. bags or in bulk. Transport costs are as follows:

1) A charge of ₱3.55/MT (₱.15/bag) for short-haul delivery within a thirty-kilometer radius.
2) A charge of ₱0.10/MT/km. (₱.004/bag/km.) for long-haul overland trips.
3) Shipping rates are fixed by the Public Service Commission (PSC). Barge rates are 20 to 40% lower.
4) Stevedoring costs at port is about ₱2.30/MT (₱.10/bag), loading or unloading.

Each bulk shipment delivery is about 14 MT and at about 5% lower than delivery in bags. As of 1965, the bulk sales of two of the three companies having bulk shipment facilities was 10 to 15% of the total value of their sales.

Source: PDCP, *Cement Industry Study,* 1966.

EXHIBIT 10
SHIPPING RATES FROM THREE MAJOR PORTS TO SELECTED DESTINATION, 19
(Pesos/Bag, 1966)

Shipping Port	*Manila*	*Cebu*	*Iligan*	*Davao*
Destination:				
Manila		.67	.94	1.40
Romblon	.44			
Iloilo	.61	.34	.53	1.00
Cebu	.67		.42	1.02
Tacloban	.74			
Butuan	1.05			
Cagayan de Oro	.88	.35	.30	1.00
Dipolog	.86	.34	.40	
Zamboanga	.90	.42	.54	.66
Cotabato	1.18	.80	.88	.65
Davao City	1.38	1.02	1.07	–

There are no regular shipping routes between certain ports so that shipments have to be routed in a roundabout way.

EXHIBIT 11

PROJECTIONS (AS OF 1970) OF DEMAND, SUPPLY AND RETAIL PRICES

Year	*World Bank Estimate of Demand (15% growth)* million bags	*Potential CAP Supply Estimate* million bags	*Retail Price*	*Prod./Demand* *
1968	62.1	61.6	–	–
1969	71.4	71.6	₱3.70	1.0
1970	82.1	99.3	3.65	1.1
1971	94.4	139.3	3.05	1.2
1972	108.6	161.5	3.02	1.2
1973	125.	170.4	3.30	1.18
1974	143.6	174	3.65	1.1

*1. The estimate of prices is based on a regression analysis between past prices and the ratio of estimated production for domestic use over demand. It is assumed that in the future, 1/2 of domestic surplus will be exported, thereby reducing the glut.

2. Estimated supply is taken as 80% of capacity, a figure based on the experience of cement plants in the past years.

3. As of July 1969, retail prices have dropped to ₱3.20 to ₱3.50, although in some remote places in the Philippines the retail price was about ₱4.00 to ₱5.00

Source: EDF, 1969.

EXHIBIT 12
COST STRUCTURE AS OF 1969

Capacity	*Fixed Prod. Cost*	*Variables Cost*	*Finance Charges*
12,000 bags/day	₱ 3,600,000	₱1.00	₱2,000,000
24,000 bags/day	5,400,000	1.00	3,000,000
30,000 bags/day	9,500,000	1.00	N.A.
30,000 bags/day	6,500,000	1.00	4,200,000
36,000 bags/day	7,500,000	1.00	5,500,000
50,000 bags/day	11,200,000	1.00	1,400,000
50,000 bags/day	9,500,000	1.00	7,500,000

Plant	*Capacity*	*Price C & F, Manila*	*Supplier*
I	14,000 bags/day	$3.6 million	Kobe Steel
II	18,000 bags/day	4.8 "	Kobe Steel
III	24,000 bags/day	5.6 "	Kobe Steel
IV	29,000 bags/day	7.2 "	Kobe Steel

EXHIBIT 14
INDUSTRY FINANCIAL CONDITIONS

	1968	*1967*
Profit and Loss (x ₱1,000)		
Net sales	₱143,118	₱111,025
Cost of sales, incl. interest	107,479	79,200
Net income	19,173	17,276
Balance sheet (x ₱1,000)		
	1968	*1967*
Current assets	₱ 88,064	₱ 70,831
Property, plant, equipment	450,167	346,444
Less: accum. depreciation	57,087	42,603
Net property, plant, equipment	393,080	303,841
Total assets	₱473,128	₱389,397
Current liabilities	113,635	80,438
Long-term liabilities	171,246	151,053
Equity	138,247	157,906
Total liabilities	₱473,128	₱389,397

Note: The above financial statement represents six cement companies that have been operating for at least a year, and whose total capacity represents 70% of the industry.

EXHIBIT 13

FIXED INVESTMENT RELATED TO SCALE OF CEMENT PLANT OF SELECTED COUNTRIES
(In Dollars/Ton of Capacity)

Capacity in Tons/year	Fed. Rep. of Germany		U. S. S. R.		U. S. A.		Republic of the Philippines			
	In Dollars (Dry Process Plant)	As % of Cost for 200,000-ton Plant	In Dollars (Wet Process Plant)	As % of Cost for 200,000-ton Plant	In Dollars (Dry Process Plant)	As % of Cost for 200,000-ton Plant	In Dollars (Wet Process Plant)	As % of Cost for 200,000-	In Dollars (Wet Process Plant)	As % of Cost for 200,000-ton Plant
33,000	48	200	–	–	–	–	–	–	25	104
66,000	35	146	–	–	–	–	–	–	–	
100,000	29	121	–	–	65	120	35	109	22	92
200,000	24	100	63	100	54	100	32	100	24	100
400,000	19	79	40	64	45	83	25	78	23	96
500,000	–	–	36	58	43	80	–	–	–	–
1,000,000	–	–	29	46	30	56	–	–	–	–

Conversion ratios:

(1) Rouble/dollar ratio of eight to one.

(2) ₱3.92 to $1.00.

Source of foreign data: *United Nations Studies in Economics of Industry,* "Cement Industry", 1963.