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CAPITAL REQUIREMENTS FOR EXPANSION OF THE ELECTRIC UTILITY INDUSTRY IN LATIN AMERICA

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` I

In the rapidly expanding economies of Latin America, one of the bottlenecks to exonomic development and social betterment has been the shortage of
electric power. Since the end of World War II, there has been an unprecedented
expansion of the electric power industry in the less developed countries of the
world. Despite this, however, existing facilities continue to lag behind the
increasing demand. The necessary expansion of the electric power industry has
required huge capital investments, both on the part of the privately-owned segment of the industry and by the governments concerned.

In order to finance this program, enormous amounts of new capital have been required. The amounts available for expansion from operations, though substantial, have not been large in relation to the need. A complex of factors has deterred new investments in the industry, locally and abroad. The low and uncertain return in the electric power industry, as compared with returns avail able in unregulated enterprises, has inhibited local investment. The low return available, plus the uncertainty of remitting earnings, have prevented private foreign capital from making new investments in these situations. Under these circumstances, electric power enterprises have had to rely more and more for new local capital on public funds, sometimes the proceeds of excise taxes on electricity sales or other special taxes, but more often the result of extension of government credit. The chief sources of foreign funds to finance expansion in the case of both private and public enterprises have been the International Bank for Reconstruction and Development ("World Bank") and the Export-Import Bank (Eximbank). The recently created Development Loan Fund of the United States and the Inter-American Development Bank are additional sources of such capital.

The needs for capital by the electric power industry in the less developed countries will continue with the progressive development of the nation al economies. The magnitude of the problem is indicated in the report of the Economic Commission for Latin America entitled "Energy in Latin America" (UN. 1957) wherein it was estimated that the Latin American countries would require the installation of 11,080,000 kw of additional capacity in the period 1955-1965. The estimated cost of this program, together with the necessary transformation, transmission and distribution facilities, was approximately \$5 billion. Any estimate of requirements for the period 1960-1970, giving effect to the same growth rates as that taken in the 1957 study, would probably result in somewhat higher requirements for the present decade. In the light of these requirements and the nature of the industry, the problem of obtaining funds is not one of emergency financing; long-term policies are called for. If the privately-owned companies in a country cannot attract capital or are deterred from doing so by political and economic uncertainties, then the government must either assume the burden of furnishing new capital to the industry or undertake to construct new power facilities itself. Either course places electric power in competition for the government's limited capital resources with schools, roads, harbors, sanitation and other non-income producing needs of a developing economy. Further, unless governments are to finance the neces sary expansion by inflationary methods, they must obtain a larger share of the nation's private savings, either through the sale of government securities or through increased taxation.

Electric utility expansion need not, however, be a stimulant to inflation or a deterrent to expansion and improvement of other facilities required for economic and social betterment. A government may determine that it is in its national interest for electric power enterprises to be self-supporting. In that case the industry, whether publicly or privately-owned, must be allowed to earn such rates as will:

- 1) permit internal generation of cash through appropriate depreciation accruals and retained earnings to aid substantially in financing expansions; and
- 2) attract fresh capital from investors, not once, but repeatedly.

Whether the electric industry in Latin America can be established on a self-supporting basis depends in great part on the regulatory conditions under which the industry must operate. Regulation which has as its principal objective the lowering of rates without regard to the economies involved is self-defeating.

Difficulties in obtaining sufficient capital to finance the necessary expansion of the electric power industry is not limited to the Latin American countries but has also been experienced by countries with a higher degree of economic development. Thus, the Organization for European Economic Cooperation, in describing the problem of O.E.E.C. countries stated: (X)

[™]Since the war, the financing of capital expenditures in the electricity sector seems to have been affected mainly by the following factors:

- (a) The higher cost of living and heavier taxes have reduced private savings and, consequently, the supply of money available from all sources for investment;
- (b) Owing to the currency devaluations which have occurred in various O.E.E.C. countries and, in some cases, threaten to continue, private investors are reluctant to finance long-term projects. As electricity supply undertakings must mainly rely on long-term loans, they have been particulary affected by this cautious attitude on the part of the investor:
- (c) The economic policy adopted by government in several countries has checked the rise of electricity prices and kept them below the level indicated by other economic factors[™].
- (X) Organization for European Cooperation (Electricity Committee)
 The Price of Electricity and its Relation to Investment in the Electricity Supply Industry, 1953).

The basic problem of the electric power industry in countries going through the development stages such as those of Latin America may be stated as an imbalance in the relationship between the regular annual rate of increase in demand and the availability of funds to finance the necessary installations. In most areas the successful execution of electric expansion programs has been jeopardized because of:

- 1) An undue emphasis on low rates with resultant inability of the enterprises to obtain adequate earnings and adequate annual allowances for depreciation.
- 2) A very serious and progressive inflation and a demonstrated inability or unwillingness to allow compensatory adjustments to the electric power industry.
- 3) A steadily deteriorating position in the foreign exchange value of the local currency with associated difficulties in the remission of adequate earnings and interest to foreign investors.
- 4) A rapid pace of industrialization with attendant large profits to investors in those industries and consequent greater demands on the already over-burdened electric power enterprises.

Among the characteristics of the electric power industry which have a profound effect upon the financial needs of the industry are:

- 1) The high annual average rate of growth of the industry of 8%-10% per year.
- 2) The capital-intensive nature of the industry. It requires about \$4.00 to \$5.00 of capital to produce \$1.00 of revenues. This may be compared with the usual manufacturing industry where 50 \$ to \$1.00 of investment will produce \$1.00 of revenues.
- 3) Property used in the electric utility industry has an extremely long life. This has two consequences:
 - a) Monies generated by depreciation accruals represent only a small part of the expansion needs of the company. For example, properties having a 40-year life will have an average annual rate of depreciation of 2-1/2% on a straight-line basis. This may be compared with general manufacturing where property may have a useful life of ten years with a consequent annual average depreciation rate of 10%.
 - b) In contrast with manufacturing industries, there is no turnover of inventory. In effect, the installed plant of a company constitutes the inventory of the company. This immobility and the long life of plants results in the need of making long-term commitments. The electric utility entrepreneur cannot just pick up and go home or sell off his properties.

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- 4) The electric utility industry is allowed a lower rate of return that is, a lower profit ratio than that enjoyed by non-regulated industry. Those who attempt to justify this low rate of return do so on the theory that the operations of an electric utility are secure; that it is a riskless business and, therefore, the profit may be kept down. In point of fact, the risk element has been greater in the electric utility business in many of the Latin American countries than that in many non-regulated businesses because of the inflexibility of regulation in the light of persistent inflation.
- 5) As compared with manufacturing, the electric utility industry must pay out a relatively high percentage of its earnings as dividends. Thus, in the United States the average payout is about 70% of the earnings available for the common stock. In manufacturing industries, the payout ratio is much lower, thus making available more funds internally for expansion. As a corollary, the electric utility company must obtain more funds from outside sources.

II

In many of the countries of Latin America, the rates of electric utilities have been kept at ridiculously low levels while the prices of all other commodities and the cost of labor have spiralled with inflation. The situation of unduly low rates in the electrical sector of the economy with severe inflation generally have had serious effects on the electric industry, some of which are:

- 1. Depreciation accruals in terms of constant purchasing power have been so low as to provide little capital for expansion.
- 2. Unduly low profits in relation to the profits that could be realized out of business, manufacturing or real estate, have prevented invest ment in the electric utility industry.
- 3) Since currency constantly depreciates in an inflationary environment. preservation of its value depends on its being put to work. Hence, in these circumstances, investment gives rise to speculation where assets purchased may be quickly converted or where there is a hedge against inflation.
- 4) The low price of electricity in relation to competitive fuels for heating and cooking further increases the demand for electricity. thus further aggravating the shortage situation.
- 5) The shortage of electricity inhibits industrial development and economic growth.
- 6) At this point, governments concerned over the electricity shortage, instead of reaching the obvious conclusion that there is something wrong with the rate structure in the electricity sector, often decide that the answer lies in the governments supplying electricity.

- 7) But, the standard adopted has often been not that electricity was needed, but that CHEAP electricity was needed.
- 8) This conclusion has solved nothing except to further foster inflation. Printing press money pumped into the economy to finance such expansion, plus a continued low rate policy finally result in -
- 9) Nobody not even the governments being able to raise money for expansion unless the rate situation is straightened out which is what should have been done in the first place.

III

The argument that cheap electricity - without regard to its cost to the producer - is necessary for economic development does not stand analysis in the light of the relationship of electricity costs to the costs of manufacture and the costs of a household budget. Numerous studies have been made in many countries concerning this question and they all come to the same general conclusion, namely:

- 1. The cost of electricity in the usual household budget represents no more than one to one-and-a-half percent of the total of that budget; and
- 2. The cost of electricity in normal manufacturing operations, excluding extractive and chemical industries, amounts to no more than 1% to 2% of the cost of the manufacture.

These relationships surely indicate that the great hue and cry made by politicians concerning the cost of electricity is absolute demagoguery.

In view of these relationships, an increase in the price of electricity by as much as 50% will not materially increase the cost of the manufactured product. Hence, electricity prices cannot be material in furthering inflation. But, the absence of electricity in adequate amounts does substantially further inflation by resulting in either a scarcity of goods or deficit financing.

IV

With this brief sketch of the financial background of the electric utility industry, we may now consider the problems of financing expansion and the effect of certain regulatory practices on those problems.

The starting point in determining whether a proposed construction program can be financed is the past earnings record and the anticipated earnings of the company. The past earnings record constitutes the most reliable criterion as to the future earnings potentialities of the enterprise. However, such history cannot be relied on entirely for a future projection since effect must be given to any new or foreseable factors that will affect revenues and expenses. The prospective investor will generally not give full effect to possible changes until they have been tested by actual experience.

In the normal operations of a utility, certain rule-of-thumb relationships may be established. Thus, if the composite depreciation rate is 2-1/2% of gross plant, the rate of expansion is 10% per year, prices are steady and depreciation monies are used entirely for expansion, then depreciation funds

will supply 25% of the total cost of construction of new plant. Using data derived from operations of electric utility companies in the United States, we see that the average return on net plant amounts to over 6%, and the average return on the equity (the sum of common stock and surplus, excluding preferred stock) amounts to over 10%. With an average interest cost of under 4% (reflecting present interest costs of around 5%, and historical costs of around 3%), an average existing equity ratio (the relationship of common stock and surplus to total capitalization including long-term debt) of about 37%, and a dividend paid out of ratio of about 70%, retained earnings will produce about 10% of the cost of expansion. On this basis, 65% of the cost of expansion will have to be raised from outside sources - that is, new money must be acquired for this purpose. In Latin America, with higher interest rates, the rates of return on overall plant and on the equity must be considerably higher than in the United States and, because of the scarcity of capital, retained earnings must contribute a greater amount to expansion.

Before discussing the sources of this new money, let me make certain observations concerning the amount of depreciation and the rate of return.

Stated in the simplest terms, depreciation represents reimbursement made by the ultimate users of a product for the consumption of plant entering into the manufacture of that product so that it may be replaced at the end of its useful life. In the normal course of amnufacturing, the exhaustion and obsolescence of machinery and plant constitute an expense of operation and, hence, figure in the cost charged by the manufacturer for his product. In this respect, there is no difference between the normal manufacturing process and the generation and distribution of electricity. Absent proper charges for depreciation, the investor would find that at the time of exhaustion of plant his capital would be completely dissipated. The only way that he could protect himself then would be by earning such a high profit that part of the profit constituted a return of capital so that, upon scrapping a plant, he would still have recovered his capital investment. Obviously, no one will invest money where his capital is going to be completely dissipated.

The proper allowance of adequate amounts of depreciation is essential from three viewpoints:

- 1. To the extent that there is not a proper allowance for depreciation, the capital of the investor is confiscated.
- 2. In an expanding industry, depreciation monies constitute a very important source of funds for expansion. At this point, let me emphasize that while these funds come from consumers, as do all the revenues of any enterprise, they do not constitute an investment by consumers but a reinvestment by the investor of part of his own capital.
- 3. New investors will not risk their funds in an enterprise where depreciation allowances are not adequate unless the profit is high enough to compensate for the partial confiscation of capital.

One other observation should be made with respect to depreciation. I mentioned earlier that, given constant prices and with the other assumptions,

depreciation monies would account for about 25% of the expansion costs. Now, if there is a material increase in the price level, the amount of goods purchasable with depreciation monies is substantially decreased. For example, a 100% increase in the price level means that depreciation monies, instead of accounting for about 25% of the expansion costs, will account for only 12-1/2% of the expansion costs.

These observations on depreciation lead directly into the question of rate base and the rate of return, since these are among the most important factors considered by a potential investor in an electric utility.

It may be useful to compare very briefly the rate base and rate of return situation in the United States with that of some of the Latin American countries. In the United States, most of the individual states observe what is known as a net rate base-original cost principle. The average rate of return applied to this rate base is around 6%. Some of the states allow what is called a fair value rate base and some a reproduction cost rate base.

A net original cost rate base is a perfectly appropriate method of regulation, provided that the rate of return is increased with changes in the price level. This, however, is the great difficulty. With serious inflation, the rate of return can become so high applied to the original cost rate base as to produce an illusion of great profit while, in fact, the earnings may not be at all compensatory. In the United States, an original cost rate base has worked well in recent years for several reasons, among the most important of which are:

- 1. The rate of inflation in the United States has not been so serious in view of the expansion of the industry as to seriously jeopardize earnings.
- 2. At the same time, as inflation progressed in the United States, interest rates went down, thereby leaving more earnings available for the common stock and thereby, making up somewhat for the inroads of inflation. Incidentally, this trend of decreasing interest rates has now been sharply reversed with the result that new rates must reflect these increased costs and, as a result, regulatory commissions are now granting higher overall rates of return.
- 3. Together with lower interest rates and a rapid rate of expansion of plant, there has been an increase in technological efficiency. One example of this is improved thermal efficiency resulting in reductions of as much as 25% in the consumption of fuel per kwh.

The rate of return of 6% is a misleading figure to those not fully conversant with American regulation. The rate of return, as that term is used in the United States, produces an amount of money designed to cover all interest charges, dividends on preferred stock and earnings on the common stock. With the existing overall interest costs mentioned previously, and the average equity ratio mentioned previously, a rate of return of 6% on the net rate base produces a return on the common stock equity of slightly over

10%. This is the actual record of the privately-owned electric utilities in the United States. Obviously, with higher interest rates in Latin America, the return on the common stock equity must be substantially higher if capital is to be attracted to electric utilities.

In the Latin American countries, there are differing systems of regulations. Those which base the return on an original cost rate base have found that the limitation on the rate of return has completely inhibited the investment of private funds in the electric sector of the economy. Perhaps, the outstanding example of this situation is Brazil where the rate of return for electric utilities is limited to 10% on a rate base expressed at historic cost in the local currency. The consequences of this limitation are apparent when it is considered that in 1960 the purchasing power of the cruzeiro was approximately 3-1/2% of its 1939 purchasing power, and the cost of living was over 2,800, using 1939 as 100.

Under these conditions, non-regulated industries have been free to revalue their assets in accordance with currency depreciation so that the return to their investors has tended to approach the historic return in terms of purchasing power although even here inflation makes inroads on capital. The electric utility industry, on the other hand, with long-term investments valued at a fraction of their true worth for rate purposes and without the ability to revalue its assets is, in effect, steadily confiscated.

The result of this disparate treatment of regulated and non-regulated businesses is revealed in a comparison of returns on investments made in non-regulated and regulated businesses in Brazil for the period 1948-1958. This shows that the return on non-utility investments in terms of constant purchasing power increased by 63% over a 10-year period, while the return on utility investments shrank by 77%. Any wonder then that Brazilian investors in recent years have not placed their funds in electric power securities?

By way of contrast, the ability of electric utility companies in the United States to attract capital for expansion is accounted for by the data in the attached table setting forth the earnings and ratios of 25 companies located in different sections of the country. These results may be summarized by company groups as follows:

<u>Return on Net Plant</u>	Number of Companies
*	
6% to 6.5%	4
6.6% to 6.9%	7
7.0% to 7.5%	7
7.6% to 7.9%	3
8% and over	4
	25

Turning to the return on the common stock of these same companies, we find the following dispersion and range of earnings:

% Return on Common Stock Equity Number of Companies under 10% 1 10%-10.9% 4 11%-11.9% 5 12%-12.9% 4 13%-13.9% 4 14%-14.9% 4 15% and over 3

Taking the same twenty-five companies, we find that in terms of earnings and dividends, the investors have had the following experience over the past five years:

% Increase in Dividends (per share)

	No. of Companies
Under 10%	2
10%-20%	\cdot $oldsymbol{ar{2}}$
20%-30%	$\ddot{2}$
30%-35%	5
35%-40%	4.
40%-50%	5
50%-70%	2
70% and over	3
	25

% Increase Earnings (per share)

•	No. of Companies
15%-20%	2
20%-25%	4
25%-30%	4
30%-35%	4
35%-40%	2
40%-50%	$ar{2}$
50%-60%	$\overline{2}$
60%-70%	2
70%-80%	3
	2 5

I have gone into the United State's experience for the purpose of showing that electric utility companies can successfully compete with industrial undertakings for the investor's dollar where the companies are given the conditions necessary for security of earnings and a modest growth potential. The other end of the scale is shown clearly by the Brazilian experience which is not a typical of electric utility companies in Latin America.

In view of the fact that investment risks are greater in Latin America, it would be expected that the return on investment would be greater there than in the United States- and this is recognized in the non-regulated areas of business. Since the actual experience is that earnings are lower for Latin American utilities than those of the United States, it is no wonder that private capital - both local and foreign - is not available for investments in Latin American utility operations.

Not only must regulation allow an adequate return if capital is to be attracted, but rate relief must be prompt. Undue delays in granting rate relief impose earnings attrition on the affected companies from which they may never recover if inflation persists. These delays, sometimes referred to as time lag in an inflationary situation, are like a dog chasing its tail. The electric utility never catches up. Rate relief is no sooner granted than it becomes obsolete and new rate relief must be sought which, again, is obsolete at the time of its effectiveness.

The seriousness of this problem of earnings attrition has been recognized by many commissions in the United States and various methods have been adopted to provide a measure of relief. In some states, a percentage amount is added to the rate of return to compensate for delay. In others, (at least 21 states) effect is given to the year-end balances to determine the rate base rather than to the average of the beginning and end of the year. In still others, a forward-looking rate base—that is, one beyond the period under review—is assumed as the basis.

The fact that electric utility securities have not generally received wide acceptance in most of the Latin American countries may be attributed to a number of reasons, among the most important being:

- 1. Where inflation is serious, the inability of electric utilities to adjust their rates in accordance with inflation has resulted in a constant lowering of the actual or real return on capital. By this, I mean that if an electric utility investor started with a rate of return of 10% on the common stock and there has been a very serious inflation, in terms of purchasing power his return may be no more than 2, 3 or 4%.
- 2. The opportunities for profit in unregulated industry, real estate and business have been much greater than those in the electric utility sector. Hence, funds have been attracted where opportunities of profits are the greatest. In this connection, it may also be noted that the fundamental concept of a limited return in the electric utility industry is that such a company enjoys a monopoly situation and that, therefore, the risks of loss are insubstantial and the return is assured. This is theoretically sound but, in practice, it means that in an inflationary climate without proper inflationary adjustment provisions the electric utility is assured of a market and, hence, a greater burden to raise more capital is imposed on it while, at the same time, it is assured of constant confiscation of the capital invested in the business. And I need not tell you that, under these circumstances, capital cannot be attracted to the business so that the so-called security, or absence of risk in this situation becomes an absolute myth.

3. Capital markets in many of the countries are not very well organized. It is generally stated that there is a shortage of capital for investment in these countries. It is my own view that it is not so much a shortage of capital as it is a misdirection of capital. For example, in the United States, the principal investors in bonds of electric utility companies are life insurance companies and, among the principal investors in equity securities are pension funds, insurance companies and investment companies. In many of the Latin American companies, in lieu of life insurance funds and pension funds as we know them here, there are various "cajas" whose funds are invested most often in government securities or low-cost housing.

To fill the void created by the lack of investment funds for electric utility securities, some of the countries have developed local governmental financial institutions such as Corporacion de Fomento in Chile, Nacional Finan ciera in Mexico, and the National Bank for Economic Development in Brazil. These agencies have constituted, in varying degrees, an important source of local funds to finance expansion of the electric utility industry. But. for these institutions to be effective, they should be able to rotate their funds. Any investments in the electric utility sector by these agencies should be marketed to the general public, thereby making more funds available to the governmental lending agencies for other developmental purposes without resorting to an undue expansion of bank credit for that purpose. I mean by this that if financing by the Development Bank is regarded as permanent in character, there may be a built-in inflationary device in the country. If, on the other hand, the Development Bank makes its investments only until such time as the public investors become receptive to these securities, then it is truly fulfilling its functions of a development bank. For these reasons, it is extremely important that the Development Bank take an active and leading interest in the establish ment of a proper climate for investment in the electric utility industry.

Conclusions and Recommendations

The problem of attracting capital for expansion of electric power in Latin America has been studied in detail by Professors Cavers and Nelson in five countries. As a result of the investigations - in which I had a part - the following conclusions were reached:

"The Latin American government which is prepared to to allow the industry rates enabling it to cover the cost of the service it provides - and to do so even in a period of considerable inflation - will, it is submitted, find that the industry (whether publicly - or privately-owned) will become able to finance its own expansion - and by ways that are not inflationary. At the same time, both the correction of uneconomic rate levels and structures and the effect of drawing on savings for investment in the industry would operate as counter-inflationary influences. What does this entail in terms of regulatory policies?

First, the industry should be able to adjust its rates rapidly enough so that operating cost increases will not prevent it from realizing an adequate level of earnings.

Second, as a means of enabling the industry to compete with unregulated investment opportunities for national savings and foreign investments, provision should be made for regular adjustments in the capital accounts of electric enterprises, public as well as private, to reflect significant changes in the domestic price level and, when relevant to outstanding securities, in the exchange value of the national currency.

Third, the regulatory authority (and any financial authorities having jurisdiction) should be prepared to approve forms of securities that are adapted to the industry's needs in an inflationary economy. They should adopt measures, where necessary, to open up markets for the distribution of those securities among institutional investors and perhaps should require investment by such of the electric industry's business and even residential customers as make especially heavy demands upon its capacity.

Translating the foregoing suggestions into concrete operating terms, this means that an electric utility, in order to provide the conditions essential for the attraction of capital, should:

- 1. Cover all operating expenses and taxes plus an adequate allowance for depreciation and a reasonable return on the capital invested.
- 2. What constitutes a reasonable return must be determined in the light of what is necessary to attract capital in the country concerned and not by reference to what rates of return are permitted in other areas where capital and risk conditions are different.
- 3. The attrition in earnings resulting from time lag can be eliminated by allowing automatic adjustments in rates which result from increases in expenses where such increases are either passed upon or the result of government action or result from competitive bargaining. In other words, in those areas where the enterprise itself does not have control over costs, increases in costs should be immediately reflected in increased rates.

The objection sometimes made to this procedure that the government will lose control in regulation seems specious since sufficient safeguards can be created to prevent abuses for, in order to put the utility company on the same basis as non-regulated industries which seek capital, the regulated industry should have the same privileges with respect to revaluation of property, incorporation of free reserves, issuance of free stock and similar matters which will protect the investor. On this score, it is necessary to point out that in an inflationary environment, no investor is willing to put his money into long-term debt at a fixed interest rate simply because his money constantly loses value. An investment in a utility which does not have the ability to revalue its assets puts the investor in substantially the same position as a debt holder with the result that only a foolhardy investor would risk his capital in such circumstances.

Lest the foregoing appear to be theoretical, let me mention the fact that the new electric service law in Chile reflects some of the suggestions made above, as does to some degree the electric service law in Peru. However, no law is self-operating and achievement of the objectives of sound regulation depends on the regulatory commission's interpretation and application of the law. That interpretation should be based on the notion that the regulatory objectives of regulation are reasonable rates to consumers, adequate service and a reasonable profit to investors. If these are achieved, the problem of obtaining capital will be resolved.