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FINANCIAL RESOURCES FOR TELECOMMUNICATION DEVELOPMENT

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FINANCIAL RESOURCES FOR TELECOMMUNICATION DEVELOPMENT

ABSTRACT

Telecommunication utilities operating efficiently on commercial lines are able to generate a very high proportion of investment funds for maintaining a high growth rate of telecommunication facilities with reasonable tariffs, and therefore to provide good quality service promptly on demand to all segments of the population with little or no net outside funds. Notwithstanding the above, telecommunication service is very poor and the investments grossly inadequate in most developing countries. The paper explains that such continued underinvestments cause an adverse spiral which simultaneously leads to a worsening of the quality of service and a rapid increase of the net outside fund requirements. To bring the situation back to normal, and how this situation is a direct result of the lack of a commitment to develop telecommunications rather than resources.

The paper then outlines a strategy for reversing the adverse spiral with a relatively modest investment over a period of about five to seven years after which the funds for further expansion can be met mostly from the revenues of the telecommunication utility. Experiences of some countries have been described to show that the strategy outlined is realizable. The paper then deals with the foreign currency requirements for provision of telecommunication facilities and the justification therefor. Finally, the paper deals with the implications of the above findings to the borrower and the Bank.

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FINANCIAL RESOURCES FOR TELECOMMUNICATION DEVELOPMENT

by C. P. Vasudevan 1/

Introduction and Summary

1. Telecommunication services in many developing countries are grossly inadequate. Convenient access to service through telephone connections in business or residential premises is confined mostly to the principal cities and towns. While service through public call offices is provided at some of the smaller towns and larger rural communities, the numbers of such call offices are small. Basically, access to telecommunication services usually covers only about 10% or less of geographical area in most developing countries. Even in localities where telephone connections at business and residential premises are provided, the waiting time to get connected often takes several years. The quality of service in the metropolitan areas is generally poor, caused by chronic congestion and overload. The long-distance and international services are also very often subject to congestion and delays. The need for expansion is obvious. Telecommunication projects are generally well conceived and provide a high rate of return. Despite these considerations, investment in this sector in developing countries has over the years generally lagged well behind demand. The single major cause of poor and inadequate service in developing countries is inadequate investment continuing for long periods of time.

2. The chronic underinvestment of this sector in many developing countries cannot be explained by normal project analysis, but seems to be due partly to inadequacies in the national process of allocating resources between sectors in developing countries and partly to a lack of appreciation of the nature and distribution of benefits from telecommunication investments. In addition, the national planners seem to be unaware of the ability of telecommunication utilities to meet most or all of the investment requirements from user-based resources 2/ without needing budgetary contributions. These are discussed below.

1/ The author is Telecommunications Adviser, Energy, Water and Telecommunications Department. The opinions expressed in this paper should not necessarily be taken as reflecting the views of the World Bank. The author acknowledges helpful comments from Messrs. R.H. Sheehan, J.J. Warford, J. Davis, R.J. Saunders and C.R. Dickenson.

2/ The term "user-based resources" throughout this paper comprises of all the elements of the financing plan which are based on internally generated funds (net operational surplus plus depreciation) less debt service (interest and amortization of standing debts) together with new borrowings and in a few cases small amounts of equity. Specifically, this term excludes provision of any government budgetary contributions.
3. In developing countries the allocation of resources to different sectors is done by the national planning agency. Because of the difficulties of making intersectoral comparisons caused by difficulties in quantifying benefits from different investments, decisions by national planners are largely based on practical, intuitive or ad hoc considerations. Further, the incidence of benefits from investments in this sector is difficult to trace and isolate since telecommunications function in effect as the nervous system of the economy and its use is multipurpose and its impact pervasive. 1/ Direct correlation between the size and scope of telecommunication development and national goals is inherently difficult to establish. Further, telecommunication investments, unlike for example those for electricity projects, appear indivisible; that is, if capital is limited, fewer telephones can be provided instead of delaying the entire project. 2/ Therefore, discussions on whether all or only part of the demand should be met become endless and inconclusive.

4. To remedy this unsatisfactory situation, the general approach by the borrowers, Bank and others has been to intensify the study of benefits from telecommunication services and on how these benefits are distributed among the different groups. Apart from being difficult, such studies require several years and considerable effort. Even then, these studies deal with benefits at the micro-level over the short term, because the sequence of benefits at the macro-level or over the long term are too complex and indirect to visualize empirically. As a result, even in the best of situations the anticipated short term benefits to the different groups are the only factors available for decision making. Despite the above, it is essential that such studies be pursued to reinforce the other arguments supporting adequate investments in this sector.

5. This paper addresses the problem from a new and different approach by looking into the extent of financial resources required for meeting the objective, as in all public utilities, of providing good quality telecommunication services to all customers who are willing to pay adequately for such services. In this connection, the paper analyzes the situation in three groups of countries, namely the industrial and some developing countries which provide good quality service and meet the demand promptly, and many developing countries where the service is poor and the waiting time to get connected very long. The paper notes that all industrial countries and some developing countries—the latter expanding at very high growth rates—committed to providing good quality service are able to finance their expansion largely or wholly through user-based resources. On the other hand, in countries where inadequate investments are continued over the years, the quality of service is poor, the waiting time for connections long and in addition substantial amounts of funds other than from user-based funds are required for overcoming the gap between demand and supply. Further, the paper explains that the

1/ See PUN-17 Brief on Bank Group Lending for Telecommunications.

2/ This is however incorrect. The deterioration of service and other ill effects caused by inadequate expansion is progressive; when continued for some years, the cumulative effect is catastrophic (see para. 11).
continued underinvestment causes an adverse spiral which simultaneously
leads to a worsening of the quality of service and a progressive increase
of the fund requirements to bring the situation back to normal.

6. The obvious conclusion from the above is that the net outside
funds--other than from user-based resources--is either nil or minimal when
the gross investments are adequate through the years to expand in line with
demand, while on the other hand the net fund requirements continually in-
crease if the gross investments are inadequate over the years. In effect,
telecommunication utilities can normally meet the demand promptly and pro-
vide good quality service through expansion largely or wholly financed from
user-based resources without budgetary contributions. The problems of poor
service and delays in meeting demand are not related to financial constraints
but to poor management and lack of commitment by government and the utility
to allow the facilities to expand in line with demand.

7. This paper suggests a short term plan to remedy past deficiencies
and to bridge the gap between demand and supply in countries which have under-
invested over the years, based largely on the successful strategies followed
in recent years by countries such as Singapore, Taiwan, Korea, Brazil, etc.
The plan calls for only a modest infusion of budgetary contributions for about
five to seven years after which the telephone utility will be able to expand
rapidly with financial self-sufficiency. It is also expected that after some
more years, these utilities will be able to make significant financial contribu-
tions to government after meeting its expansion needs. The paper also deals
with the foreign currency requirements for the provision of telecommunication
facilities and the justification therefor.

Status of Telecommunication Development in Different Countries

8. Governments and telecommunication utilities in industrial countries--
hereafter called Group 1 countries--have always believed that telecommunication
answer basic social and economic needs. The utilities in these countries
now provide good quality service to all the communities in the country and
connect new subscribers promptly to the network—at present, all business
users and about 30% to 90% of all households have telephones. These utilities
are now encouraging the remaining households to get connected and are also
taking steps to stimulate the use of all forms of telecommunication. Because
almost all of business-related demand has been met in earlier years, the
annual rate of growth of demand and of supply is from 3% to 10%. These
utilities are generally able to finance all their expansion from user-based
revenues 1/ without need for outside equity funds, viz., internally generated
funds—depreciation and surpluses after debt service—provide a large part of
the funds for expansion (e.g. 100% in the case of Sweden and over 80% in AT&T
of U.S.A.), the balance being found from borrowings, which in turn are serviced
from revenues. Tariff levels are set to achieve the dual objectives of extend-
ing service progressively to almost all of the residences and of maintaining a
sound financial position through adequate generation of internal funds for
capital investments. Thus while the gross investments in telecommunications

1/ See footnote on page 2.
generally are about 4% of the Gross National Capital Formation (GNCF), the net outside funds are generally nil; in many countries, the telecom entities actually contribute to the rest of the economy through dividends, direct subsidies to postal operations and taxes.

9. Some developing countries, e.g. Taiwan, Korea, Brazil and Singapore—hereafter called Group 2 countries—have a commitment to expand telecommunication facilities to all segments of the population, similar to those in Group 1 countries. Telecommunication utilities in these countries have maintained very high annual growth rates of 16% to 28% for many years—partly to wipe out arrears in meeting demand in earlier years and partly to meet the high surge in new demand—and are providing good quality service to connected subscribers. Much of the accumulated waiting lists for connections have been cleared and the delay for connecting new subscribers is only a few months. The required investments are being met largely or wholly from user-based resources 1/ without outside equity or budgetary contributions, and in some cases the utilities subsidize postal services, contribute to government, pay taxes, etc. as in the case of some Group 1 countries. But, since tariffs are high in relation to incomes as compared with industrial countries, 2/ the penetration of telephone services extends at present to many but not all of small businesses and to only a relatively small proportion of households; the service is also now largely confined to the cities, towns, and larger rural communities. These deficiencies are being rapidly overcome.

10. However, in many developing countries—hereafter called Group 3 countries—there is little or no commitment to adequate development of telecommunication facilities. The quality and extent of service is grossly inadequate—congestion, poor quality of service, several years of waiting time to get a telephone connection, large areas of the country without service, etc. Telecommunication surpluses are often diverted to subsidize postal operations or provide budgetary support at the cost of inadequate telecommunication development. The allocation of resources to this sector has over the years been grossly inadequate.

11. In direct contrast with utilities in Group 1 and Group 2 countries where the quality of service and financial self-sufficiency in this sector is steadily improving, the position of utilities in Group 3 countries is bad and worsening largely because of the following:

- Continued lag in investment over the years has progressively increased the gap between demand and supply of telecommunication services resulting in a progressive deterioration of service. 3/

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1/ See footnote on page 2.
2/ In absolute terms, generally lower than in industrial countries.
3/ With fewer than necessary telephones available to businesses and government, the usage of the available telephones progressively increases. Hence other subscribers trying to call these telephones increasingly get busy signals and make repeat attempts to establish the call. These repeat attempts overload the call handling equipment in the telephone exchanges leading to a rapid deterioration in the quality of service and in turn to loss of revenues.
Since the amount of internally generated funds is related to the number of subscribers and the size of the network, a slower of growth caused by under-investment has resulted in less generation and investment of such internally generated capital over the years; the size of such internally generated funds foregone as a result of slower growth has become very large as a result of compounding from year to year, particularly because of the high financial returns usually 15% to 25% on investments in the sector.

The longer such underinvestment has been allowed to continue, the greater the financial resources required to bridge the gap between supply and demand, requiring even more commitment from the national planners and more resources than was required but not provided in earlier years; this increase in fund requirements is a result of the internally generated funds foregone in earlier years.

Due to increased unit costs of providing service caused by not having been able to avail of possible economies of scale, which is quite high in this sector, the size of expansion is further eroded to a significant extent.

Denial of telecommunication facilities to government, business, industry, agriculture, transportation, etc. leads to gross diseconomies and distortions.

12. The experiences in the countries of Groups 1 and 2 above demonstrate clearly that telecommunication utilities are able to meet the demand promptly and provide good quality service through expansion largely or wholly from user-based resources without budgetary contributions or outside equity. The problems of poor service and delays in meeting demand in many developing countries (Group 3 countries) are not related to financial constraints in this sector but to poor management and lack of commitment by government and the utility to allow the facilities to expand in line with demand. Further, the underinvestment in earlier years in Group 3 countries has to be made up by large outside equity or budgetary contributions sooner or later to improve service and close the gap between supply and demand (see para 11 above), as compared with little or no fund requirements in the case of Group 1 and 2 countries. In effect, the policy of providing adequate investments over the years to keep in line with demand represents the least cost solution; this solution also maximizes the benefits by providing good service and prompt subscriber connections.

Strategy for Development

13. Thus in Group 3 countries which have underinvested over the years, the remedy is to turn the problem round and break the adverse spiral by adopting a short term strategy designed to bridge the gaps in developmental, financial, organizational and operational areas and to bring them to the
position of Group 2 countries. This strategy is based on the successful plans adopted in recent years in several Group 2 countries—Singapore, Taiwan, Korea, Brazil, etc. 1/—where the telecommunication utilities have significantly increased the rate of growth of telecommunication facilities while simultaneously achieving self-sufficiency for financing expansion at a high growth rate (see paras 9 and 17).

14. The principal elements of a successful strategy are:

(i) A program of expansion to be completed say in five to seven years, designed to improve service, increase the rate of growth of connections to a level higher than the expected growth rate of demand to catch up with past arrears, and maximize incremental revenues (see para. 15 below).

(ii) A financing plan such that the entity will be in a sound financial position at the end of the program period. The financing during this period should be largely through equity (including if necessary some selective increase in telephone tariffs for increasing internally generated funds) and with some long term borrowings, so that future debt service charges are modest in relation to gross internal cash generation.

(iii) Organizational changes and improvements to improve efficiency of operations and productivity, to effect procurement of goods and services at lowest cost and to control operational expenditures; and training of staff.

15. To realize the objectives of para 14 (i) above, the expansion plan must give special priority to meet the demands for international, long-distance and local calls in the shortest possible time and thereby to provide prompt and reliable service. These services provide a very quick and high incremental financial return on the investments—the cost recovery period for incremental investments to handle international calls is only a few months, for long distance calls from 6 months to 30 months and for local calls from 24 to 36 months—and thus quickly and significantly contribute to improve financial performance. In addition, a steady expansion in the number of subscriber connections is essential to sustain a steady increase of the above profitable calls because without such an increase the connected subscriber lines tend to get overused with the increasing traffic causing problems of repeat calling 2/ and loss of revenues. Further, experience in all countries

1/ Telecommunication Services of Ethiopia is another example of what can be achieved with good management. Though its goal and performance are not as spectacular as the countries named, it has managed to provide an adequate quality of service and to finance all of its expansion from its beginnings in 1955 to the present entirely from user-based resources without any contribution from government. Its rate of growth has been about 14% annually in the last decades.

2/ See footnote on page 4.
shows that improved service directly stimulates traffic to a significant extent and that the demand for new connections spurs as soon as the delay in providing connections is reduced to reasonable periods. In planning for the initial expansion, the infrastructure such as buildings and the installations of long-distance and international facilities should be such that these take account of the expected surge in demand and is designed to permit further expansion quickly, if necessary, to meet possible higher than expected demand.

16. An essential requirement for success is full commitment of government and the utility to such a program. The time, effort and financial resources required to complete this program will depend on the circumstances in each case. However, based on the experience of many countries (see paras 17 and 18 below), the tasks can be completed in a majority of instances in about 5 years or so with outside funding (mostly equity) of the order of about 4% of the Gross National Capital Formation (GNCF) initially tapering to 1% or less towards the end of the period—a small amount considering that it is a one-time investment of outside funds which would enable the utility to finance further expansion largely or wholly from internally generated funds and commercial borrowings which will be serviced from revenues.

17. As examples of achievements possible in this sector, the performance of the telecommunication utilities in Taiwan and Singapore 1/ is examined in some detail. The situation about a decade ago in 1967 or thereabouts in these countries typically reflected the general situation now prevailing in Group 3 developing countries, namely low growth rate (12% in Taiwan, 8% in Singapore) in relation to demand, long waiting time for connections, poor quality of service, etc. The financial position, while being reasonably good relative to many developing countries, was still weak and could barely support the low growth rate of expansion. These countries have followed a general strategy similar to those outlined in paras 14 and 15 above. As a result these utilities have grown substantially in the past decade (Taiwan 6.3 times, Singapore 4.2 times) and are expanding at a growth rate of over 25% per year in Taiwan and 27% in Singapore at this time with a financing plan in which the internally generated funds (14 times in Taiwan and 15 times in Singapore as compared with a decade earlier) not only meet the construction and associated expenditures but also make significant payments to government. Subscriber applications for being connected are met more or less on demand. Current expansion uses SPC electronic systems to provide maximum subscriber facilities, the quality of service is very good, and a complete range of telecommunication services are available, viz., mobile services, data, facsimile, international subscriber dialing, etc.

18. Another example which vividly illustrates the improvements in the financial position, when changing from a pattern of low growth rate to one of high growth rate is that of France which has embarked on a rapid program

1/ Chosen because of Bank participation in the sector in these countries in the late 60's and the availability of the latest annual reports of the entities.
of expansion in the 75-82 period. 1/ This program will increase the number of subscriber telephone lines in France from 6.2 million in 1974 to 20 million in 1982—in other words, in eight years France will install more than twice the number of lines that she had installed in the previous 100 years raising the density of lines from 11.7 in 1974 to 35 per 100 inhabitants in 1982. The annual rate of increase in the number of connected subscriber lines, which was about 7% before this program, will exceed 18% for three consecutive years during the eight-year program period and then level off at almost 14%. The financing will be with internally generated funds and long-term loans. The internally generated funds which were close to 75% to 100% of the capital investments during the preprogram slow (6% to 8%) and steady growth period, drops to 40% when the growth rate is accelerated to 18% and goes back up to 90%—with a 14% steady growth—at the end of the program period in 1982. The financing plan also shows that with such a well-conceived plan the internally generated funds will continue to grow more than four times in absolute terms and equal 90% of the capital needs for providing 1.8 million lines in 1982, as compared with 78% of the capital needs for providing less than 0.5 million lines in 1971. While France is not a Group 3 or Group 2 country and has considerable financial, technical and managerial resources, the program illustrates the feasibility of funding a very ambitious burst of expansion wholly from user-based resources and for sustaining a high growth rate thereafter.

Foreign Costs

19. An issue frequently raised in the funding of telecommunication investments relates to the need for foreign exchange. Arguments have been advanced that the income produced once the project is completed is in local currency, so that foreign exchange must be earned in other sectors to pay for the imported goods and services for the project. Such arguments for limiting the size of telecommunication investments are invalid for the reason given in the next paragraph.

20. While the foreign costs represent in many cases about 50% to 60% of the total outlay, the foreign exchange requirements for this sector are a small proportion in the range of 0.5% to 2% of the total imports of the country. Even this foreign exchange requirement can be reduced significantly by setting up domestic manufacture of cables and equipment which are economical in many cases and provide other benefits. Secondly, telecommunication services directly improve the operational efficiency and productivity which in turn help reduce investment requirements in terms of foreign as well as total funds in many sectors, e.g. in industry, transportation, etc; telecommunication investments also increase foreign currency earnings in some sectors, e.g. export and tourism. Further, since a large part of the imports in most developing countries include consumption items, e.g. gasoline for private car travel, and capital imports often not direct—or even indirect—foreign exchange earners, the case for the allocation of foreign exchange to this sector should be straightfoward.

1/ The information in this paragraph is taken from an article in the November 21, 1977 issue of Telephony by Mr. Gerard Thery, Director General of Telecommunications, France.
Implications for Bank Operations

21. The principal findings in this paper point to an increased Bank role and Bank participation in this sector to enable governments and the telecommunication utilities in developing countries to realize the full benefits of a good telecommunication service with only modest investments of outside funds. In order to do so Bank assistance is required in three important areas. Firstly, Bank should assist in drawing up a suitable plan of expansion with a high growth rate aimed at progressively closing the gap between supply and demand and at achieving financial self sufficiency. Secondly, since such a plan to be successful calls for early improvements to the borrower’s organization and operational working over a wide area, the Bank has an additional role in helping the borrower in identifying and implementing the necessary changes. Thirdly, the Bank has to assist countries in putting together a suitable financing package which will include increased size of Bank loans to cope with the large investments needed particularly during the transition period of about seven years or so between the new increased level of investments and the realization of the increased revenues therefrom.