Data communications in 1980—A capital market view

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INTRODUCTION

Communications industry revenues presently represent approximately 2 percent of the GNP and are growing substantially faster than the GNP. The important question thus arises as to what capital resources will be available to support continued growth in the Seventies—a question of particular interest to the data communication user, whose needs are projected to expand at an explosive rate. By 1980, this growth could occur in any of the following areas:

- Continued use of the existing analog telephone network as well as new data services on the Picturephone network;
- New digital private line facilities offered by the existing carriers;
- Expansion of Western Union facilities and service offerings;
- Domestic satellite systems;
- Private line and switched facilities of the special service common carriers;
- Possible joint use of data on CATV systems.

This paper examines the capital resource needs of each of the major communications industry segments, and then, in the light of the likely expansion of the GNP and the consequent expansion of funds available from the capital markets, projects what data communication facilities are likely to be available by 1980.

While it is obviously difficult, if not impossible, to accurately project ten years into the future, we hope that the estimates made in this paper will provide a basic understanding of the problems and opportunities confronting the industry in the coming decade.

CAPITAL REQUIREMENTS TO 1980

The capital requirements of the communications industry for 1971-1980 are developed in this section for each of six market segments. Projections of operating revenue and gross plant, based primarily on industry expectations, are shown in Table I. Plant investment provides an indication of total financial requirements which, in turn, leads to our estimates of capital market demands shown in Table II.

Telephone

In terms of revenue and capital requirements, the telephone companies, and the Bell System in particular, have dominated and will continue to dominate the communications industry. The present telephone network, including the independents, serves a total of about 125 million telephones, which is up from 74 million in 1960 and 94 million in 1965. Interstate messages handled per year have increased from 1.0 billion in 1960 to 1.6 in 1965 to 2.7 billion by the end of last year. Gross plant investment has increased 134 percent in the decade of the Sixties, and today stands at over $66 billion. Annual revenues during the same period grew from $7.8 billion to $16.8 billion, or an increase of 215 percent.

In looking ahead to 1980, several factors should be kept in mind. AT&T has shown that local telephone service growth correlates closely with the growth in new family formations, and that demographic statistics indicate that with those entering the 18-to-25-year marriageable age category in the coming ten years, local telephone growth is expected to average 8 percent yearly. Toll service revenue, which grew an average of 11.5 percent yearly in the 1960s, finished the decade with growth of 15.2 percent in 1969. In 1970, during the economic downturn, network long distance revenues grew close to 8 percent for Bell. Interstate telephone message volume, excluding WATS, is expected to increase to about 10 billion messages per year by 1980 and Bell expects the number of private line circuits to more than double. We thus believe that total revenue growth...
From the telephone sector of communications can be reasonably expected to grow at an 8.5 percent to 10 percent compound rate through 1980.

Certainly, additional revenues generated by such growth areas as data communications and the Picturephone network will augment this growth. Bell has forecast growth in data transmission revenues from $500 million in 1970 to $5 billion in 1980. A Picturephone network of from 500,000 to one million terminals can be safely assumed for 1980, with data usage estimated at 25 percent of total network usage.

The telephone industry has conservatively estimated annual revenues approaching $50 billion by 1980. This would imply gross plant investment of over $160 billion in the industry by 1980. Based on our models of the industry, we estimate a need for about $53 billion in outside financing to fund this telephone plant investment. This includes roughly $5 billion in 1971, which accounted for almost all of the communication industry’s capital demand.

**CATV**

CATV today serves over 6 million homes in over 4500 communities. Growth from 650,000 homes in 1960 and 1.3 million in 1965 has been at an annual rate of about 25 percent. With the projected implementation of the recent FCC proposals, growth to 25–30 million subscribers by 1980 is indicated. Revenues, up from an estimated $39 million in 1960 and about $80 million in 1965, reached $360 million in 1970. We believe revenues can reasonably be on the order of $1 billion by 1975 and $3.1 billion by 1980, reflecting greater channel usage and two-way services. Gross plant investment from a $900 million level in 1970 should be at about the $2.6 billion level in 1975 and $7.8 billion in 1980. This will require an estimated $5.7 billion in outside financing.

**Special service common carriers**

The special service common carriers, both DATTRAN and the MCI types, are obviously starting from scratch. Construction permits are being issued by the FCC in accordance with the broad general policy laid out in the final order in Docket 18920. Estimates vary as to the impact these carriers will have on the industry. Forecasts of 1980 revenues range from $750 million (Arthur D. Little) to $2 billion (Frost and Sullivan). Taking a conservative approach, an estimated gross plant investment of at least $1.5 billion by 1980 and an external financing requirement of $1.2 billion is indicated.

**Western Union**

Western Union is rapidly moving to become the major provider of computer-enhanced record com-

<table>
<thead>
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<th>TABLE II—External Financing Projections (Billions of Dollars)</th>
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<td>1971-75</td>
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<tr>
<td>---------</td>
</tr>
<tr>
<td>Telephone</td>
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<tr>
<td>CATV</td>
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<tr>
<td>Special Service Common Carriers</td>
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<tr>
<td>Western Union</td>
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<tr>
<td>Domestic Satellite</td>
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<tr>
<td>Refinancing</td>
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<tr>
<td><strong>Total Est. Annual Requirements</strong></td>
</tr>
<tr>
<td>1975</td>
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<tr>
<td>1980</td>
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Source: Salomon Brothers’ estimates.
munication in the United States. The concept of providing a fully integrated family of common user and private line message switching services took a giant step forward with the cutover in January of this year of the first of its Phase II ISCS Centers at Middletown, Virginia. This center, with a capacity of over one million prime time business messages per year, is currently being used to provide a wide variety of data communications services. Based on projections of growth for these varied services, revenues are likely to grow from the current $400 million level to over $1.5 billion by 1980. Since Western Union’s computer-enhanced communications services provide an inherently efficient utilization of transmission and message switching facilities, this revenue level can be supported with a gross plant investment of only an estimated $3 billion, with $1.1 billion of external financing required.

**Domestic satellites**

Domestic satellites represent another exciting potential source of facilities for the data communications user in 1980. Here, however, it is necessary to realize the type of data communications which lend themselves feasibly to Domsat carriage. Due to the inherent time delay involved in an approximately 45,000-mile earth station-to-earth station path, these facilities are not really suitable for interactive types of data communications. Bulk transfer of one-way information, similar to the type of electronic mail currently being offered by the joint Postal Service/Western Union Mailgram service, is ideal, and certainly must be viewed as technically and economically feasible. Based on a projection of three operational systems carrying a variety of communications services by 1980, potential revenues of $400 million with a gross plant investment in both satellite and earth station facilities of about $1.2 billion seems reasonable. Taking into account the high depreciation rates on the satellites, we estimate that $0.8 billion will have to be raised from the capital markets.

**Total requirements**

The sum total of our projections shows a demand for new external capital of over $71 billion which must be raised in the ten-year period from 1971 to 1980. Additionally, over $5 billion must be raised to refinance telephone company bonds that will be maturing in the same period. The total capital requirements of the communications industry, therefore, exceeds $76 billion.

**TABLE III—Capital Market Overview**

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<tbody>
<tr>
<td>GNP</td>
<td>$504</td>
<td>$632</td>
<td>$977</td>
<td>$1300-1450</td>
<td>$1800-2200</td>
</tr>
<tr>
<td>Total Credit &amp; Equity Market Supply</td>
<td>35</td>
<td>68</td>
<td>92</td>
<td>120-140</td>
<td>150-200</td>
</tr>
<tr>
<td>Source: Salomon Brothers’ estimates.</td>
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</table>

This amounts to an annual rate of approximately $7 billion a year in 1975 and $10 billion in 1980. As shown on Table II, the telephone companies will use about 90 percent of this capital.

**CAPITAL MARKETS THROUGH 1980**

To fully understand the significance of these demands by the communications industry on the capital market, it is necessary to examine trends in both total money supply and demand in competing sectors of the economy.

**GNP and net new capital**

The GNP in current dollar terms stood at $504 billion in 1960, $632 billion in 1965, and $977 billion in 1970. This represents a growth in current dollar terms of over 6.8 percent per year. Looking out to 1975 and 1980 real growth in constant dollar terms of between 3.5 percent to 4.0 percent is estimated, with inflation of 3.0 percent to 4.5 percent yearly, yielding a growth in current dollar terms of 6.5 percent to 8.5 percent. It is estimated that the 1975 GNP will fall in a range of $1300 billion to $1450 billion, and the 1980 GNP will be between $1800 billion and $2200 billion (Table III).

In the late 1960s the average percent of the GNP saved and invested by government, business, and individuals ranged between 8.1 percent and 9.9 percent, with 9.0 percent as an average. Using the late 1960s as a representative model of what is likely to be encountered in the 1971-1980 time period, the total supply of debt and equity available for funding growth in the U.S. economy will likely be between $120 billion and $140 billion in 1975, and between $150 billion and $200 billion in 1980.
TABLE IV—Selected Demands Segments

<table>
<thead>
<tr>
<th>Percent</th>
<th>1961-65</th>
<th>1966-70</th>
<th>1971E</th>
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<tbody>
<tr>
<td>Private Mortgages</td>
<td>41.6</td>
<td>26.3</td>
<td>32.3</td>
</tr>
<tr>
<td>Total Corporate</td>
<td>12.4</td>
<td>22.7</td>
<td>23.5</td>
</tr>
<tr>
<td>State &amp; Local</td>
<td>16.8</td>
<td>14.1</td>
<td>16.5</td>
</tr>
<tr>
<td>Federal Agencies</td>
<td>2.5</td>
<td>7.7</td>
<td>2.6</td>
</tr>
<tr>
<td>Sub-total</td>
<td>67.3</td>
<td>70.8</td>
<td>74.9</td>
</tr>
<tr>
<td>All Others</td>
<td>32.7</td>
<td>29.2</td>
<td>25.1</td>
</tr>
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</table>

Source: Salomon Brothers' estimates.

Market demand

The total demand for funds can be categorized as follows:

A. Debt
   1. Privately held mortgages
   2. Corporate bonds
   3. State and local securities
   4. Foreign bonds
   5. Business, consumer, and bank loans
   6. Open market paper
   7. Privately held Treasury and Federal Agency Securities

B. Corporate Equity
   1. New cash offerings
   2. Sale of stock options
   3. Conversions of bonds

Of these categories, total corporate demand, mortgages, and certain governmental segments are of particular interest. The historic trends for these selected demand segments are shown in Table IV.

In the early 1960s corporations were relatively modest demanders of capital. In the 1961-65 period, corporate demand represented $35 billion, or 12 percent of the total demand for capital. By contrast, privately held mortgages consumed $117 billion, or 42 percent, of the total available funds. In the 1966-70 timeframe the comparable figures were $56 billion and 14 percent. For 1971, state and local governments required about $30 billion, or 16 percent, and demand from this sector is expected to continue to increase.

Another factor to consider is the growth in Federal Agency financing. In the 1961-65 timeframe these agencies funded $7 billion of debt—only 3 percent of the funds available. By the 1966-70 period total Agency demand had increased over four times to $31 billion or almost 8 percent of the total. The 1971 Agency demand is estimated at only $3 billion, or 3 percent.

CONCLUSIONS

Financial competition

Based on the above analysis, projected communications demands can now be placed in perspective, comparing them to the rising demand for corporate funds as a whole. In the 1961-65 period the communications industry required $7 billion in outside financing or some 20 percent of all corporate demand. Comparable figures for the 1966-70 timeframe were $13 billion and 14 percent. In both 1970 and 1971, however, annual requirements exceeded $5 billion and accounted for 17-18 percent.

TABLE V—Communications Financing Demand
(Billions of Dollars)

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<tbody>
<tr>
<td>Total Communica-</td>
<td>7.0</td>
<td>12.7</td>
<td>5.4</td>
<td>31.2</td>
<td>45.4</td>
</tr>
<tr>
<td>Percent Total</td>
<td>20</td>
<td>14</td>
<td>18</td>
<td>15-18</td>
<td>15-20</td>
</tr>
<tr>
<td>Corporate</td>
<td></td>
<td></td>
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</table>

Source: Salomon Brothers' estimates.
As shown in Table V, it is estimated that the communications industry will continue to require 15-20 percent of the total corporate needs for external financing. In the coming decade, with increasing demands from all sectors of the economy, the industry will have to make itself relatively more attractive than its competitors in the capital markets in order to continue to attract this large a share. This means good balance sheets, “clean” accounting practices, attractive rates of return on both total capital and equity, and, of course, growth in earnings per share.

Very obviously, these requirements may be very difficult to achieve for the new entrants in the communications industry. In the more competitive, less sheltered atmosphere envisioned by both the FCC and the President’s Office of Telecommunications Policy, a license to get into the business may not necessarily be a guarantee for making a profit, nor adequate collateral for obtaining capital funds. We feel very strongly, therefore, that communications in this decade will be shaped more decisively by financial constraints than by any other factor.

Data communications in 1980

In light of our view of the future of the communications industry as a whole, the following predictions can be made about the availability of data communications facilities in 1980.

A. The Bell System, with its continuing strong financial position, will continue to dominate the data communications business. Now that Bell has recognized that there will be a $5 billion data communications market in 1980, and that competition is increasing, we think you will see many more services geared to the data user. It is important to note that these services can be provided as an adjunct to voice (and, eventually, Picturephone services) with a relatively small incremental investment. Last year’s announcement of future digital services, based on a “Data Under Voice” technique, is an indication of this approach. We also believe that, with the possible congestion of microwave frequencies for use in urban distribution of data communications signals, Bell will open up its cable distribution plant to low level, direct current type signals, eliminating the need for costly modems for limited distance use.

B. CATV will not have achieved its potential as a major provider of local data interchange services by 1980. The CATV business is a particularly capital-intensive one, whose growth will be financially limited. It is our opinion that the primary industry thrust in this decade will be to use its available financial resources to expand its subscriber base in the residential entertainment market. While certain token two-way services may be offered to serve specific markets or meet FCC regulations, full-scale development in this area will be postponed until the late Seventies or early Eighties.

C. The competitive response of the established common carriers to the MCI-type carriers will sufficiently limit the financial attractiveness of new point-to-point services, and keep them from becoming a major communications factor. DATRAN’s nationwide, switched, digital system, on the other hand, is both technically unique and inherently more economical than either private line or switched analog facilities, or private line digital facilities. We feel DATRAN can be providing about 10 percent of the data communications traffic by 1980, assuming that its initially high capital requirements can be met.

D. We believe Western Union’s centralized thrust—that of providing a fully integrated computer-centered message switching and transmission system to serve the record communications needs of business, government, and the general public—is an extremely viable one. Western Union’s overbuild of its existing microwave network with full digital transmission capability very obviously allows them to make the most efficient use of their plant, with minimal capital investment. It is our feeling that Western Union will continue to aggressively market new communications services, as they have done with DATACOM, and that with the availability of their new Electronic Data Switch Network the company can be providing a whole range of switched and private line digital data services by 1975.

E. The use of satellite systems, except those provided by Bell and Western Union as fully integrated parts of their already existing and currently planned network operations, will be far too costly and far too limited for broad applicability to data communications.

The growth of data communications services and, in a broader sense, of the entire communications industry,
is governed by the technological, marketing, and financial capabilities of the competing companies. Too often, discussions on the future of data communications concentrate on its exciting technological developments and potential applications demands while neglecting the very obvious fact that facility growth must be financed. As shown by the projections made in this paper, financing communications growth in the Seventies is a non-trivial problem with broad implications for users and providers alike.