Remedies for Telecom Recovery Project
- Managerial Strategies Recommendations –
Final Report

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Research program “Remedies for the Telecom Industry”
Columbia Institute for Tele-Information
Columbia Business School

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I. BACKGROUND AND APPROACH:

The objective of the Managerial Strategies Module of the “Remedies for Telecom Recovery” project was to identify possible management actions that could be taken to address some of the industry’s problems. The module’s underlying premise was that the widespread poor performance of the industry cannot be blamed on specific management teams, and has to be consequently related to fundamental structural factors. With this objective in mind, a group of industry executives and academics\textsuperscript{1} was assembled to discuss potential management initiatives.

The discussion was organized around four broad categories. Each category was the topic of a workshop to which concept papers were submitted and discussed\textsuperscript{2}. Topics addressed in each workshop included the following:

- **Workshop I:** Is there a need to develop a new industry structure?
  - Value of scale and scope
    - Vertical/horizontal integration (value of the merger)
  - Inter-player collaboration
  - Value chain fragmentation (wholesale/retail)
    - Role of the regulatory framework

- **Workshop II:** Can the industry achieve an adequate return on invested capital?
  - The telecom industry compared to other industries (historical analysis)
  - Drivers of operator performance (Why some players perform better than others?)
  - Prescriptive analysis of ROIC improvement
    - Restructuring debt, including declaring bankruptcy
    - Reducing operating expenses and capex
    - Top line growth

- **Workshop III:** Can the industry achieve profitable growth?
  - Enterprise market needs
  - Consumer market needs
  - Value of convergence (infotainment/telecom, fixed/mobile, content/mobile)

- **Workshop IV:** Is there a need to develop a new operating paradigm?
  - Targets of performance
  - Achieving the benefits of scale and scope

\textsuperscript{1} See list of advisory committee in Appendix A
\textsuperscript{2} List of concept papers, and workshop minutes are included in Appendices C and D
II. UNDERSTANDING THE PROBLEM:

In the last three years we have witnessed the emergence of fundamentally different telecommunications industry dynamics resulting in increasing pressures across both the wireline and wireless segments:

• **Slowing growth**: Basic access line growth has been negative in 2002 (-2.2% in 4Q, 2001) for the first time since 1932, and has stagnated ever since (see exhibit 1).

Exhibit 1: US Access Line Growth
(1Q01-1Q03, %)

```
<table>
<thead>
<tr>
<th>Quarter</th>
<th>Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>1Q01</td>
<td>0.6%</td>
</tr>
<tr>
<td>4Q01</td>
<td>-2.2%</td>
</tr>
<tr>
<td>1Q02</td>
<td>-2.8%</td>
</tr>
<tr>
<td>4Q02</td>
<td>-3.8%</td>
</tr>
<tr>
<td>1Q03</td>
<td>-3.8%</td>
</tr>
</tbody>
</table>
```

*Source: Booz Allen Hamilton*

Incremental wireless penetration has been decreasing since 2000-01, with the last two quarters of 2002 already showing clear signs of slowdown in subscriber growth (see exhibit 2).
On the other hand, while wireless traffic keeps on growing, this is driven primarily by price elasticity.

- **Severe price-based competition in all industry segments:** Pricing in basic local, long distance, wireless, and enhanced data services has been consistently declining. For example, price per wireless minute has fallen from 56 ¢/min in 1995 to 11 ¢/min by the end of 2002 (see exhibit 3). Similarly, long distance pricing has been falling at a compound rate of 6% in the past eight years. Acceleration of UNE-based competition in the local exchange is also triggering price reductions in major metropolitan areas.
• *Acquisition and retention of customers has become more expensive:* The cost to acquire a new customer in the US wireless market has reached $360, the highest in the world. In the case of a broadband customer (e.g. DSL), acquisition costs amount to approximately $350. On the other hand, customer churn remains approximately 2.5% per month, which means that a large portion of sales and marketing resources of telecommunications carriers are assigned to limiting subscriber attrition (see exhibit 4).

**Exhibit 4: US Wireless Churn**

<table>
<thead>
<tr>
<th>Year</th>
<th>Monthly Churn Rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1997</td>
<td>2.1%</td>
</tr>
<tr>
<td>1998</td>
<td>2.4%</td>
</tr>
<tr>
<td>1999</td>
<td>2.6%</td>
</tr>
<tr>
<td>2000</td>
<td>2.7%</td>
</tr>
<tr>
<td>2001</td>
<td>2.6%</td>
</tr>
<tr>
<td>2002</td>
<td>2.5%</td>
</tr>
<tr>
<td>2003</td>
<td></td>
</tr>
<tr>
<td>2004E</td>
<td></td>
</tr>
<tr>
<td>2005E</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Churn Rate</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>3.2%</td>
</tr>
<tr>
<td>Low</td>
<td>1.9%</td>
</tr>
</tbody>
</table>

Source: Company reports; BAH analysis

These trends have put a severe pressure on margins, which are down from a healthy 45% in 1995 to an expected 33% in 2002.

Furthermore, capital investment pressures to deliver the next generation of services (e.g., 2.5 G in the case of wireless, and DSL in the case of wireline) while maintaining the existing plant and accommodating the growth in traffic have been growing. Total capital spending by the wireless industry this year is expected to be $23.3B, which is slightly higher than the spending last year of $22.7B. Capital spending as a percentage of revenues among telecommunications carriers has historically ranged between 25% and 34%, and is currently at its lowest point of 22% (due to the significant reductions by the Incumbent Local Exchange Carriers). However, this is still above the
threshold of 20% typically required to generate sustainable returns on any investment\(^3\). In Exhibit 5 we can see that the historical ratio of capex/sales of around 17-18% seen in the early ’90s, accelerated to a peak of 34% by 2000. We should remember, moreover, that the earlier ratio corresponded to a much more controlled competitive environment, whereas the latter corresponded to a much higher level of competition (both within the telecommunications industry, and from outside players such as cable operators). The implication is that increased supply combined with reduced price controls impacts industry performance doubly.

**Exhibit 5: Capex/Sales Ration - US Telecom 1990-2002E**

How quickly this excess capacity will be absorbed is a function of two factors: how aggressively will the industry ramp-down future capex, and how fast will demand grow to absorb all this available supply. Although there are positive signs on the capital side – with most major operators announcing capital expenditure levels below expectations (see Exhibit 6A and 6B), we are concerned that revenue growth will also slowdown significantly (Exhibit 7), given that two of the main growth drivers (wireless and data) are seeing substantial price erosion, and that traditional local service is facing quarterly declines in subscriptions. Furthermore, as capital spending deteriorates without resolving more fundamental issues (such as hypercompetitive industry structure), it is likely to accelerate consumer dissatisfaction and hence increase the level of industry churn, thus further perpetuating low performance.

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\(^3\) Endicott, D., *Is Low Telecom ROIC Here to Stay, and How Long Will Investors Bear This?*, New York, Program on Telecommunications Recovery, Columbia University, March 2003
Our view is that in the near term, excess capacity will continue to drive pricing pressure in the wireless and data sectors, and fixed-line displacement for the ILECs, thus making it hard for the telecommunications industry to improve its performance. This situation takes place as the capital markets – both equity and debt – have turned away from the telecommunications industry, and have, consequently, rendered capital very expensive.

Telecommunications companies have been trying to respond to the industry pressures and the demand for profitable growth with short-term management actions. Recent efforts have been focused on slashing capital expenditures, but this could seriously limit future growth potential and, hence, might not be a sustainable solution. Other actions, such as specific functional area-focused cost reductions, have only short-term benefits and, in the long run, can actually increase costs in other areas. For example, an indiscriminate reduction in customer care staff, may result in unsatisfied customers who tend to make more customer service calls and, potentially, churn faster, leading to an eventual increase in future acquisition costs in order to continue growing the subscriber base. As a consequence, while operating costs and capital expenditures
have to come down, the question remains where to cut without hampering the chances of continue growing.

The situation described above has led to an extremely difficult situation, which can be characterized as follows:

- With very few exceptions, the industry is not returning its cost of capital
- The industry structure resulting from lowering the barriers to entry and the consequent wave of investment is one where there are too many players struggling to gain a share of a market that is not expected to grow as fast as expected
- The pressure for preserving projected performance, compounded with the lack of appropriate governance processes has resulted in an unusual level of corporate malfeasance and management turnover

We will review each of these outcomes in turn.

II.1. The US Telecommunications industry is not earning its cost of capital:

Most of the players in the US telecommunications industry today return below their cost of capital. Return on Invested Capital (ROIC) is one of the key performance indicators measuring the profitability of an enterprise. While approaches to its calculation may vary\(^4\), overall estimation can be defined as follows (see exhibit 8):

\[
\text{ROIC} = \frac{\text{Net Operating Profit after tax}}{(\text{Total assets} - \text{current liabilities})}
\]

ROIC is an important metric because if an enterprise Weighted Average Cost of Capital (WACC) is higher than its ROIC, the company exhibits negative economic performance (i.e. its return on capital remains below its cost of capital). WACC varies by company and also tends to change over time. If the cost of capital for a given enterprise rises substantially, then the company will be constrained in its acquisition of assets, resulting in a marginal increase in earnings, because, as assets shrink, revenues might decline.

\(^4\) Shuper (2003) defines it as operating profit margin multiplied by operating asset turnover, or, more simply, operating profit net of taxes divided by net operating assets at the beginning of the year; Governalli (2003) measures ROIC in terms of Return of Capital Employed, which is calculated as Net Operating Profit after tax (NOPAT) or EBIT minus taxes plus amortization divided by Total Capital Employed (TCE) which is calculated as Current Assets plus Operating Cash minus current liabilities plus gross goodwill, licensing costs and other assets,
Industry ROIC metrics indicate a consistent financial underperformance (see exhibit 9):


<table>
<thead>
<tr>
<th></th>
<th>ROIC</th>
<th>WACC</th>
<th>ROIC-WACC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Verizon</td>
<td>7.0%</td>
<td>7.7%</td>
<td>(0.7%)</td>
</tr>
<tr>
<td>SBC</td>
<td>8.4%</td>
<td>8.5%</td>
<td>(0.1%)</td>
</tr>
<tr>
<td>BellSouth</td>
<td>10.9%</td>
<td>6.5%</td>
<td>4.4%</td>
</tr>
<tr>
<td>Qwest</td>
<td>0.8%</td>
<td>6.8%</td>
<td>(6.0%)</td>
</tr>
<tr>
<td>Alltel</td>
<td>8.4%</td>
<td>7.9%</td>
<td>0.5%</td>
</tr>
<tr>
<td>AT&amp;T</td>
<td>2.5%</td>
<td>10.0%</td>
<td>(7.5%)</td>
</tr>
<tr>
<td>Sprint FON</td>
<td>6.1%</td>
<td>6.6%</td>
<td>(0.5%)</td>
</tr>
<tr>
<td>Wireline Aggregate</td>
<td>5.4%</td>
<td>8.0%</td>
<td>(2.6%)</td>
</tr>
<tr>
<td>Sprint PCS</td>
<td>5.3%</td>
<td>11.0%</td>
<td>(5.7%)</td>
</tr>
<tr>
<td>AT&amp;T Wireless</td>
<td>2.6%</td>
<td>10.5%</td>
<td>(7.9%)</td>
</tr>
<tr>
<td>Cingular</td>
<td>10.2%</td>
<td>7.5%</td>
<td>2.7%</td>
</tr>
<tr>
<td>Verizon Wireless</td>
<td>6.3%</td>
<td>7.7%</td>
<td>(1.4%)</td>
</tr>
<tr>
<td>Nextel</td>
<td>7.5%</td>
<td>11.0%</td>
<td>(3.5%)</td>
</tr>
<tr>
<td>T-Mobile</td>
<td>(3.4%)</td>
<td>8.2%</td>
<td>(11.6%)</td>
</tr>
<tr>
<td>Wireless Aggregate</td>
<td>3.7%</td>
<td>10.8%</td>
<td>(7.1%)</td>
</tr>
</tbody>
</table>

Note: ROIC in this case is calculated according to the methodology provided above. Data sources are, for most cases, company annual reports and guidance for 2003; WACC has been compiled primarily from Shuper (2003) or estimated for Cingular, Verizon Wireless and T-Mobile by relying on WACC for parent companies.

*Source: Company Reports; Shuper (2003); Booz Allen Hamilton Analysis*

A comparison between our estimates and those of other analysts provides a validation of the industry’s lack of capability to generate a return on capital in excess of its cost of capital (see exhibit 10):
Exhibit 10: Comparisons in Wireless ROIC Estimations

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>AT&amp;T Wireless</td>
<td>2.6%</td>
<td>4.7%</td>
<td>3.0%</td>
<td>1.6%</td>
<td>10.5%</td>
</tr>
<tr>
<td>Cingular</td>
<td>10.2%</td>
<td>6.5%</td>
<td>...</td>
<td>7.2%</td>
<td>8.4%</td>
</tr>
<tr>
<td>Nextel</td>
<td>7.5%</td>
<td>9.9%</td>
<td>7.9%</td>
<td>6.5%</td>
<td>10.0%</td>
</tr>
<tr>
<td>Sprint PCS</td>
<td>5.3%</td>
<td>5.8%</td>
<td>2.6%</td>
<td>2.8%</td>
<td>11.0%</td>
</tr>
<tr>
<td>T-Mobile</td>
<td>(3.4%)</td>
<td>(2.9%)</td>
<td>...</td>
<td>...</td>
<td>8.2%</td>
</tr>
<tr>
<td>Verizon</td>
<td>6.3%</td>
<td>3.7%</td>
<td>...</td>
<td>4.9%</td>
<td>8.9%</td>
</tr>
<tr>
<td>Aggregate</td>
<td>3.5%</td>
<td>3.4%</td>
<td>4.5%</td>
<td>...</td>
<td>11%</td>
</tr>
<tr>
<td>Wireless</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Shuper (2003); Governalli (2003); Booz Allen Hamilton Analysis

Differences between the four estimates reflect the slightly different approaches to estimating ROIC. For example, Governalli (2003) makes adjustments in order to exclude assets and revenues associated with international, non-consolidated and non-wireless businesses. Shuper (2003), on the other hand, uses net operating assets at the beginning of the year being measured.

The data in exhibit 10 has been plotted in the scattergram of Exhibit 11 to depict graphically the overall industry situation.

Exhibit 11: U.S. Telecommunications Players WACC vs ROIC 2002

Note: ROIC in this case is calculated according to the methodology provided in the introduction. Data sources are company annual reports and guidance for 4Q02. WACC has been compiled primarily from Shuper (2003) or estimated for Cingular, Verizon Wireless and T-Mobile by relying on WACC for parent companies.

Source: Company reports; Shuper (2003); Booz Allen Hamilton analysis
As exhibit 11 indicates, the US LECs, in aggregate, are performing better than the rest of the sector. While BellSouth, SBC and Alltel are the only carriers in the industry exhibiting a ROIC above the WACC, Verizon remains relatively close. On the other hand, the long distance and wireless carriers are significantly under performing on an aggregate basis. Some wireless carriers, such as Cingular and Nextel, exhibit lower ROIC to WACC gap. This is due to their lower spectrum costs. On the other hand, T-Mobile’s negative returns reflect the carrier’s large capital base relative to its market share, coupled with its low ARPU and worse than industry average churn.

We have also compared the US sectors performance to that of other sectors and countries (see Exhibit 12):

**Exhibit 12: ROIC-WACC Worldwide Comparison (2003)**

ADD TO THIS CHART THE POINTS FOR US WIRELINE AND EUROPE WIRELINE WHICH WERE IN THE CHART YOU HAD BEFORE

![Graph showing ROIC-WACC comparison across regions]

Source: Shuper (2003), Booz Allen Hamilton analysis

When comparing the performance of the US telecommunications industry by sector to that of other regions around the world, several observations can be made. First, the ROIC performance of both the wireline and wireless sectors in the United States remains consistently negative in that, with the few exceptions mentioned above, neither sector is returning its cost of capital. The surprising consistency of results across carriers in the US, contrary to the case in other regions of the world would indicate that structural variables external to specific company performance are at play. In particular, we are pointing to the strength of the economic recession, the impact of the US
telecom/internet meltdown, the hyper competitive environment brought by the industry structure and, last but not least, the regulatory framework. The wide variance in performance in Europe might indicate that, assuming a consistent economic environment than by the industry structure and regulatory framework across Europe, company-specific levers of performance are still very important. Nevertheless, the performance of Telecom Italia, TIM, and Telecom New Zealand confirm the hypothesis that return on capital is directly related to industry structure (natural oligopoly) and regulatory framework.

The differences between the wireless sectors in the US relative to Europe and Asia reflect three specificities for the US: 1) relatively high capital intensity due to the fact that traffic per user in the US is two times the global average, 2) a disadvantaged spectrum position, and 3) high levels of goodwill, resulting from a growth-by-acquisition strategy (Governalli, 2003).

Is this a new situation? In fact, ROIC in US telecommunications began to consistently decline after 1999. In the wireline world, ROIC peaked in 1999 and has been declining ever since except for AT&T (see exhibit 13):


<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Verizon</td>
<td>9.4</td>
<td>11.9</td>
<td>8.0</td>
<td>7.1</td>
<td>7.0</td>
<td>7.7</td>
</tr>
<tr>
<td>SBC</td>
<td>12.3</td>
<td>11.3</td>
<td>9.8</td>
<td>8.6</td>
<td>8.4</td>
<td>8.5</td>
</tr>
<tr>
<td>BellSouth</td>
<td>12.1</td>
<td>13.3</td>
<td>11.3</td>
<td>10.2</td>
<td>10.9</td>
<td>6.5</td>
</tr>
<tr>
<td>Qwest</td>
<td>13.8</td>
<td>12.5</td>
<td>1.8</td>
<td>0.8</td>
<td>0.8</td>
<td>6.8</td>
</tr>
<tr>
<td>Alltel</td>
<td>6.8</td>
<td>9.4</td>
<td>9.2</td>
<td>9.2</td>
<td>8.4</td>
<td>7.9</td>
</tr>
<tr>
<td>Sprint Fon</td>
<td>10.9</td>
<td>10.4</td>
<td>7.9</td>
<td>6.2</td>
<td>6.1</td>
<td>6.6</td>
</tr>
<tr>
<td>AT&amp;T</td>
<td>16.6</td>
<td>5.2</td>
<td>1.4</td>
<td>1.6</td>
<td>2.5</td>
<td>10.0</td>
</tr>
<tr>
<td>Wireline Aggregate</td>
<td>11.6</td>
<td>9.2</td>
<td>5.3</td>
<td>5.2</td>
<td>5.4</td>
<td>…</td>
</tr>
</tbody>
</table>

*Source: Company 10Ks; Morgan Stanley; Booz Allen Hamilton Analysis*

At the same time that ROIC declined across the board, the cost of capital has increased significantly, reaching, at one point, a 200-basis point increase in borrowing costs. This is a significant surge, especially since operating earnings have leveled off in the 8-10% range.

Given the decline in cash flow as a multiple of interest costs, wireline carriers are facing a combination of higher debt costs, market pressure to reduce debt, and the imposition of higher equity premiums (Hyman, 2002). For example, credit premiums
have increased and will continue to result in very real capital and expense constraint for the wireline players (see Exhibit 14).
This holds true even in the face of decreasing revenue growth targets. Higher debt-to-earnings ratios should hinder carriers in acquiring the assets needed to support growing revenues. One could hypothesize that until wireline carriers can turn around their ROIC performance and begin to reduce debt, enterprise value will remain at risk. Why is this so important for wireline carriers now? Because we believe the industry is within 12-18 months of the next scale and scope expansion. To prepare them for this next stage, it is crucial that carriers demonstrate their potential for scale creation and capability building alongside a corresponding enterprise valuation.

The trend in declining ROIC in the wireless industry has been even more accentuated, partly resulting from the high CAPEX this sector experienced in the past three years (see exhibit 15):


<table>
<thead>
<tr>
<th>Carrier</th>
<th>1998</th>
<th>1999</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT&amp;T Wireless</td>
<td>-2.5%</td>
<td>0.5%</td>
<td>-1.5%</td>
<td>0.9%</td>
<td>2.6%</td>
</tr>
<tr>
<td>Sprint PCS</td>
<td>-13.9%</td>
<td>-12.5%</td>
<td>-5.4%</td>
<td>0.0%</td>
<td>5.3%</td>
</tr>
<tr>
<td>Cingular(*)</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
<td>10.5%</td>
<td>10.2%</td>
</tr>
<tr>
<td>Nextel</td>
<td>-8.9%</td>
<td>-3.8%</td>
<td>0.2%</td>
<td>2.6%</td>
<td>7.5%</td>
</tr>
<tr>
<td>Verizon Wireless</td>
<td>7.5%</td>
<td>6.6%</td>
<td>3.9%</td>
<td>4.2%</td>
<td>6.3%</td>
</tr>
</tbody>
</table>

*Source: Company Reports; Booz Allen Hamilton Analysis

(*) Cingular was created in 2000
In general terms, differing profiles reflect specific carrier situations. For example, Cingular, Nextel and Sprint PCS exhibit lower license costs and lower acquisition-generated goodwill than Verizon, which has sizable acquisition premiums embedded in its capital base^5.

II.2. The industry structure comprises too many players:

At the core of the industry’s performance shortfall is a situation of excessive competition in major sectors of the industry. Exhibit 16 presents a partial list of players by sector:

Exhibit 16: Partial List of Industry Players by Segment

<table>
<thead>
<tr>
<th>National Players</th>
<th>Local</th>
<th>Long Distance</th>
<th>Wireless</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Verizon</td>
<td>• AT&amp;T</td>
<td>• Verizon</td>
</tr>
<tr>
<td></td>
<td>• AT&amp;T</td>
<td>• MCI</td>
<td>• Nextel</td>
</tr>
<tr>
<td></td>
<td>• Sprint</td>
<td>• Sprint</td>
<td>• Cingular</td>
</tr>
<tr>
<td></td>
<td>• MCI</td>
<td>• ITD</td>
<td>• Sprint PCS</td>
</tr>
<tr>
<td></td>
<td>• SBC</td>
<td>• Equant</td>
<td>• AT&amp;T Wireless</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Level3</td>
<td>• T-Mobile</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Regional Players</th>
<th>Local</th>
<th>Long Distance</th>
<th>Wireless</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Broadwing</td>
<td>• US Cellular</td>
<td>• US Cellular</td>
</tr>
<tr>
<td></td>
<td>• Bellsouth</td>
<td>• Alltel</td>
<td>• Alltel</td>
</tr>
<tr>
<td></td>
<td>• Qwest</td>
<td>• Western Wireless</td>
<td>• Western Wireless</td>
</tr>
<tr>
<td></td>
<td>• CenturyTel</td>
<td>• Metro PCS</td>
<td>• Metro PCS</td>
</tr>
<tr>
<td></td>
<td>• Citizens</td>
<td>• Leap Wireless</td>
<td>• Leap Wireless</td>
</tr>
<tr>
<td></td>
<td>• Commonwealth</td>
<td>• Price</td>
<td>• Price</td>
</tr>
<tr>
<td></td>
<td>• Time Warner Tel</td>
<td>Communications</td>
<td>Communications</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Centennial</td>
</tr>
</tbody>
</table>

According to this, in any major market today, one finds 6-7 wireless operators, and 6 major LECs integrated with long distance, without counting CLECs, both in the telephony and cable/telephony domains.

Many industry observers believe that consolidation could substantially improve ROIC by reducing the level of competition and overall invested capital. In fact, the international experience indicates that operating profits in wireless are directly dependent on the number of players (see exhibit 17).

^5 Intangible assets represent over 60% of the total asset base in the case of Verizon, and 35% in the case of Cingular
According to exhibit 187, stable wireless industry structures with sustainable margins are typically oligopolies with moderate competition. Industries with more than four wireless players witness their operating margins drop significantly, not only due to irrational price competition but also to the inability of players to leverage economies of scale.

Contrast for example, the metrics of the US wireless industry, which has 6-7 competitors per market, with those of the European wireless industry, which has typically 3-4 players per market. In Exhibit 18 we can see that the US industry not only spends substantially more capex per subscriber or per pop, but also suffers from higher acquisition costs and churn, with better ARPU as the only metric in which it is superior to Europe.
Despite the wisdom of consolidation, a number of major constraints could potentially limit the degree of expected consolidation in the competitive areas of the US telecommunications industry:

- **Regulatory and Bankruptcy constraints.** Current interpretation of the bankruptcy codes is allowing uneconomic competitors to resurface after Chapter 11, with lean structures and limited debt. MCI is the most notable example, but others include a host of smaller firms. In wireless, where for now the threat of bankruptcy has been alleviated, there is still uncertainty around how supportive the FCC and DOJ will be to the necessary mergers.

- **Ownership models - consolidators.** Looking at the potential buyers is not much more encouraging. Many of the buyers face the combination of substantial debt levels with many competing demands for their scarce capital (e.g. do we expand into enterprise or entertainment or do we consolidate wireless?), which may inhibit them from an aggressive consolidation role. In addition, the top 3 RBOCs have only partial ownership of their wireless properties, at a time when they are also looking to link more closely their wireline and wireless businesses.

- **Ownership models – sellers.** Among the potential sellers, the delaying factor is of a different nature. For example, there is some potential benefit in delaying a sale by some players in order to drive up subscriber numbers to increase the company valuation. In other cases, delay could allow a company to improve its operating efficiency, and hence also its future valuation. Nextel has shown that through the combined effect of financial discipline, improvement in its operating metrics from outsourcing and other factors, and strong customer
growth, it has shifted market sentiment from inevitable bankruptcy to potential niche survivor or prized acquisition target.

The combination of the factors mentioned above is leading to a prisoner’s dilemma type of stalemate, whereby while everyone agrees on the need to consolidate, no one takes the first step. In the meantime, the industry continues spiraling down to even lower levels of performance.

Competition in wireless is not only hurting performance in this sector but also harming other more stable telecom markets such as local access. The combination of low wireless prices and regulatory-induced reselling (via UNE-P) has been driving an increase in competitive intensity in the local exchange of major metros and their periphery. Local exchange carriers have witnessed the emergence of pockets of hyper competition, which have fostered a dramatic decline in prices. The local service sector is being increasingly fragmented, with challengers controlling approximately 13% of the market (see Exhibit 19):

**Exhibit 19: Local Service Market (2002, $Bn)**

<table>
<thead>
<tr>
<th>Segment</th>
<th>Market ($Bn)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ILECS</td>
<td>$118</td>
</tr>
<tr>
<td>CLECS</td>
<td>$14.7</td>
</tr>
<tr>
<td>AT&amp;T, WorldCom</td>
<td>$10.2</td>
</tr>
<tr>
<td>All Others</td>
<td>$4.5</td>
</tr>
<tr>
<td>(e.g., McLeod, Allegiance, MFN, Choice, etc.)</td>
<td></td>
</tr>
<tr>
<td>CABLE TELEPHONY</td>
<td>$1</td>
</tr>
<tr>
<td>TOTAL</td>
<td>$134</td>
</tr>
</tbody>
</table>

In fact, aggregate market share data could be misleading since a large portion of the local challengers (approximately 55%) tends to focus on the more lucrative business segment. Competition in local services has driven relative prices down between 1996 and 2001, albeit not at the same rate as in wireless or long distance (see Exhibit 20):

---

6 We do not believe that temporary bouts of price discipline that have surfaced in the wireless sector since January 2003 are sustainable given that the potential for spoilers among six national players and/or regional operators remains too high.
The results of the recent Triennial Review have accelerated the competitive intensity. Local service challengers will continue to buy unbundled loops at UNE rates typically 50-60% lower than retail rates (e.g., AT&T’s $19.95 unlimited local calling plan in NJ, MCI “Neighborhood Plan”). When competition, based on UNE-P comes into a region, it does so based on UNE-P prices plus a margin, which is below the ILEC tariff. If the new entrant is an IXC, the margin might be smaller, since its objective is to protect its long distance business threatened by an ILEC long distance entry resulting from 271 approval. Since the new entrant pricing is lower than the ILEC tariff, the latter can respond in two ways:

- Add vertical services to the basic line offer (e.g. call waiting, caller id) in order to justify the price differential
- Introduce a promotion that matches the CLEC or IXC price

Competition from cable telephony is typically offering 10% discount on the first residential line and up to 50% on secondary lines. Even in the most dynamic segment of the local service sector, broadband DSL, subscriber growth is coming at the expense of customer value due to the competition from cable modems.

On the long distance side, incumbents will continue to suffer share erosion in the consumer segment at a rate that will not be proportional to their gains in UNE lines. Additionally, price erosion in long distance will continue its inexorable pace. The enterprise segment will remain the only base of business stability in the sector.
Looking forward (in a context of permanent regulatory uncertainty), the wireline sector remains both capital and cost-constrained, at a time when new revenue streams do not have the momentum or the scale to sustain any noticeable growth. The availability of low-cost capital and aggressive build-out by new entrants stimulated unprecedented capital spending in the late 90s (see Exhibit 21).


So far, this approach to driving revenue growth has not paid off. In fact, capital spending growth outpaced revenue growth from 1998 to 2002. The nearly $216 billion carriers have spent over the past four years to upgrade network infrastructure has yielded limited increase in earnings. With lower investment turns and slower-than-expected demand driven by technology substitution, the wireline industry is at a crossroads. Revenues of incumbents are expected to continue to drop, albeit less than in the past years, leading to further earnings declines.

The extrapolation of the current situation implies a worsening of market conditions. For example, if the wireless industry continues operating in a hyper competitive environment with six national players, it is safe to assume that customer churn would remain at current levels (between 2.7% and 3% per month), the price per minute would continue to decline (from 11c/minute today to approximately 8c/minute in 2007), although the cost to acquire a customer (CPGA) could be somewhat reduced if competitors agree to put pressure on national retailers and reduce commissions, and
put a cap on handset subsidies (consequently reaching $290 vs. $330 today). On the other hand, revenues per user would be expected to remain stable due to the price elasticities driving an increase in minutes of use. Under this scenario, the aggregate ROIC would not be expected to increase substantially beyond the 4%-5% range, making the industry unsustainable from an economic standpoint. This situation is the natural result of inordinate price declines combined with the need to increase capex to upgrade a network capable of supporting the ever-increasing MOU traffic fueled by the price elasticities.

II.3. There are significant shortfalls in corporate governance:

Shortfalls in corporate governance in the telecommunications industry have made headlines. Issues range from lack of independence of Board of Directors (Worldcom), to obscure accounting and reporting (Qwest, Global Crossing). On one hand, these issues are not common to all telecommunications operators. In general terms, the carriers that exhibited governance and accounting problems had been promising high growth targets to the capital markets, in many cases fueled through acquisitions. While these factors are not specific only to the telecommunications industry, the higher concentration of malfeasance raises the need of defining a new approach to corporate governance as a means of rebuilding investor confidence.

III. SPECIFIC MANAGERIAL STRATEGIES:

The development of a consensus list of recommendations regarding managerial strategies is non trivial. Prima facie, no company engaged in a competitive struggle as the one the telecommunications industry faces will spontaneously share particularly useful managerial strategies. In fact, the “last man standing” syndrome would naturally lead all competitors not to divulge any initiatives. On the other hand, as described in the prior section competitors are facing a prisoner’s dilemma in the sense that if each company develops and implements strategies judged to be optimal for itself, added together they could potentially lead to the destruction of the industry. The example of the airline industry in this regard is quite enlightening. In light of the current situation, it is critical for carriers to rise beyond the prisoner’s dilemma and search for some consensus on a set of strategies that could lead to restore investor confidence and build a basis for the future.

Consensus across players for the recommendations included below could vary. For example, we expect that most carriers will agree with a set of collaborative strategies aimed at sharing infrastructure or development costs, insofar that does not

7 Governalli (2003) estimates CPGA to currently be $368, while the cost to serve a customer would remain stable (or increase slightly due to the higher costs of servicing a data user

8 Goldman Sachs assumes ROCE to reach 5.7% by 2007. Goldman Sachs estimates assume no consolidation, with per minute yields likely to undergo pressure and difficulty to reduce churn and acquisitions cost. Under these assumptions, Goldman Sachs concludes that ROCE will remain well below carrier cost of capital throughout 2012
equalize competitive advantage. Similarly, recommendations regarding cost reduction are widely shared and are not expected to raise any contention. On the other hand, strategies aimed at modifying the industry structure by means of mergers and acquisitions are expected to be more contentious. However, independently from the fact that in a consolidation process there will be winners and losers, it is widely agreed that in the current industry situation (too many players destroying the value of sunk costs), unless barriers to entry are raised, both from a regulatory and a competitive standpoint, the long term sustainability of the business is at stake.

The following list of managerial strategies comprise recommendations which range from ones that should be logically shared by all players to some that will be more contentious. We have grouped them into five categories:

- Consider industry consolidation around a few vertically-integrated operators
- Fundamentally change the operating paradigm of service providers, with the consequent impact on operating expenses, capex, and company efficiency
- Promote intra-industry collaboration
- Uphaul the operators’ governance infrastructure and processes
- Achieve a step-function growth in revenues

Each of these categories will be reviewed in turn.

III.1. Consider industry consolidation:

As described before, we believe that the industry has too many players and that consolidation needs to occur. We believe that the industry restructuring needs to occur at three levels:

- Horizontal consolidation of wireless service providers
- Integration between local, long distance and wireless carriers
- Emergence of an intermediate market for goods and services purchased by the telecommunications service providers (e.g. systems integration, outsourcing, etc.)

We believe that it is only under these conditions, that the industry long term sustainability will be ensured. We will review each of these consolidation processes.

III.1.1. Achieve horizontal consolidation in wireless:

Horizontal consolidation in the wireless sector would result in three potential benefits:

- Rationalize pricing
- Reduce churn
Consolidation in the wireless industry needs to occur at two levels:

- Mergers of service providers in complementary or adjacent footprints have substantial scale benefits
- Consolidation of national players are beneficial in terms of reduction of price competition and churn, as well as the potential for a return to scale in sales, advertising and distribution

Economies of scale in the wireless industry are very high: approximately 80% (see exhibit 22).

Exhibit 22: Cost per Sub vs. Subscribers (National Operators)

![Chart showing cost per sub vs. subscribers for national operators.](chart.png)

Note: 2000-2001 Operator Data, only one observation labeled by carrier
Source: Katz et al. (2002)

It is important to point out, however, that many of the scale-related benefits have already been achieved through the gradual consolidation and operational improvements the industry has been implementing in the past ten years (see exhibit 23).

Exhibit 23: Operating Expense Per Subscriber Per Month
Wireless Scale Curves

REPLACE THE NEXT CHART WITH SPRINT AUG 27, 2003 P. 13
A cross-sectional time series analysis of cost behavior of national wireless carriers indicates that, with growth those carriers are reaching a point where the increase in subscribers does not result in an automatic reduction in unit operating costs. Nevertheless, the US wireless industry still comprises a number of smaller/regional carriers whose assimilation within any of the national carrier systems would provide the opportunity to reduce unit costs, particularly in the case of mergers of overlapping and/or adjacent footprints. The potential for cost reduction resulting from a merger of complementary wireless footprints is significant (in the case of the consolidation of Voice stream and Powertel, a reduction of 15% operating cost per subscriber was achieved six quarters after the merger).

In the case of focused acquisitions (incremental geographic coverage, additional product portfolio, etc.) benefits exist across the value chain (Exhibit 24).

Exhibit 24:
Operating Cost as a Percentage of Revenues for Target Company
These benefits are achieved primarily via either the transfer of best practices to the target company or scale related benefits, and while they are realized across all elements of operating cost, sales/marketing and advertising are more prominent. Much of this cost reduction comes from spend consolidation (e.g., media buying) and more efficient utilization of resources (e.g., sales force reorganization).

Combining multiple entities into a single efficient organization post-merger which is suitably positioned to capture the maximum scale benefits possible, is a complex process. However it can be achieved by following a sequenced transition path, which makes the interim steps realistic and implementable. Exhibit 25 illustrates the transition path when combining the operations of three independent operators operating in three adjacent regions.

**Exhibit 25:**
Sequenced Transition Path to Merge Multiple Organizations
In the context of mergers of complementary properties, the implementation of a shared services model supporting the merged carriers can result in up to 20% savings in operating expenses. The savings accrue primarily from headcount reductions and moving shared services functions to the most cost-efficient location. Further transition to a Single Company Model provides the opportunity to rationalize staff within each region. Reduction in operating expenses can be between 5-10% from this consolidation (Exhibit 26).
Exhibit 26:
Sequenced Transition Path to Merge Multiple Organizations  
(Opex Per Sub)

<table>
<thead>
<tr>
<th>Budget</th>
<th>Headcount Reduction</th>
<th>Movement to Different Cost Base</th>
<th>Other Consolidation Related Savings</th>
<th>Opex Achieved by End of Year</th>
<th>One Time Costs</th>
<th>Final Opex</th>
</tr>
</thead>
<tbody>
<tr>
<td>$180</td>
<td>$14</td>
<td>$8</td>
<td>$5</td>
<td>$153</td>
<td>$9</td>
<td>$144</td>
</tr>
</tbody>
</table>

- Reduction mainly from Customer Service
- Combining of rationalization and relocation
- Additional scale efficiencies in collections, bad debt, billing, IT maintenance
- Adjustment for one-time severance and relocation

Source: Booz Allen Hamilton analysis

Therefore, the impact of a consolidation program focused on absorbing regional carriers to leverage all scale benefits can deliver significant cost reduction and EBITDA improvement benefits.

On the other hand, the assumptions behind a merger of national carriers would be the ability to develop a new set of advantaged sales and marketing costs, reduce the level of churn and/or limit yield decline by introducing price discipline across a smaller number of players. This strategy, while intuitively attractive, raises two issues:

- Limited economies of scale: as mentioned above, players of both the wireline and the wireless industries have attained a size beyond which unit cost decreases are marginal. Furthermore, achieving economic efficiencies based on promoting best practices across merged corporations of the size discussed here is quite complex and requires significant time and effort.

- Regulatory risk and free-rider syndrome: the approach of reducing churn and price decline by means of a merger has two problems. In the first place, one merger would not be enough to have a significant effect, particularly in the wireless industry. Destructive price competition could only emerge with a balanced oligopoly of 3-4 players. Reaching this point would require significant M&A activity, which would entail significant Department of Justice approval risk. Secondly, a merger strategy needs to overcome the
free-rider syndrome, whereby a carrier would rather let someone else incur the distraction, risk

and complexities of a merger while reaping the benefits of a reduction in price competition. Under this understanding, a carrier that attempts a merger could be faced with the resulting complexities and little ability to reduce churn and limit price competition.

We also recognize that consolidation in wireless faces two implementation difficulties:

- Low valuations delays the completion of transactions
- Shareholder agreements stand in the way of mergers

In the light of the concepts reviewed above, implementing a horizontal merger strategy in wireless aimed at yielding an economic advantage entails some risk. Having said this, if a merger triggers a wave of consolidation benefits could be derived after at least three large mergers (see money center banking merger wave in the 90s). If that were to happen, the wireless industry could raise its ROIC to approximately 6%. The net impact of those transactions would be a reduction in 2007 churn to 2.7% (from an average of 3%), and a stabilization of the price yield at 8.9c/minute (rather than 7.9c/minute). Conversely, a single merger would not have significant impact on ROIC lift. However, it is important to mention that other important motivations could still drive a carrier to merge (e.g. gaining access to needed spectrum, gaining access to new markets).

III.1.2. Promote integration across wireless, Local and Long Distance:

The integration across wireless, long distance and local has several benefits for the industry as a whole:

- It builds on economies of scope and bundling efficiencies
- It allows for the reintegration of Long Distance players
- It rationalizes intermodal competition and substitution between wireline and wireless

In the case of the local exchange, economies of scale are relatively limited in the aggregate (see exhibit 27).

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9 We disagree with Governalli (2003) when he considers that wireless consolidation will have an economic impact mainly through operating efficiencies rather than stabilizing prices
According to the data in exhibit 25, regardless of the increase in active access lines operated by each individual ILEC, operating expenses per line tend to remain constant. It is only at some of the smallest ILECs, Rochester Tel and Cincinnati Bell that operating expenses per access line are somewhat higher. This is partly due to the diseconomies of complexity inherent to an ILEC's operation:

In addition, the diseconomies facing ILECs engaged in mega-horizontal mergers point to difficulty of achieving more advantageous cost position in the short and medium term. An analysis of the Bell Atlantic-GTE merger shows that the additional cost synergies to be captured by the merger are limited or at least take time to be captured (see Exhibit 28).
In this context, the opportunity to derive further economic benefits for the ILEC industry in the aggregate through horizontal mergers is limited. In fact, a cross sectional analysis of the ILEC merger experience in the US indicates only modest -after the fact scale- benefits (see exhibit 29).

### Exhibit 29: ILEC MERGER SYNERGY EFFECT

<table>
<thead>
<tr>
<th></th>
<th>PAC/SBC (’00)</th>
<th>AIT/SBC (’03)</th>
<th>BEL/NYN (’00)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenue Synergy</td>
<td>3%</td>
<td>2%</td>
<td>2%</td>
</tr>
<tr>
<td>Expense Synergy</td>
<td>5%</td>
<td>3%</td>
<td>4%</td>
</tr>
<tr>
<td>Capital Synergy</td>
<td>5%</td>
<td>3%</td>
<td>3%</td>
</tr>
</tbody>
</table>

Source: Annual Reports, press, company statements

Having said this, wireline economies of scale remain important at the micro-functional company level.
As it is in the wireless horizontal consolidation case, scale in wireline can be better captured in the case of mergers of geographically adjacent carriers due to the ease with which functional consolidation can occur. We consider these cases to be close to a focused horizontal merger model despite their size. The Bell Atlantic-Nynex is an appropriate example in this regard. The merger was a focused consolidation of properties in contiguous market areas, and hence the transition was relatively smooth. Overall, cost benefits derived from synergies amounted to approximately $1.1 Billion. However, the subsequent merger of GTE (based in Dallas) with Bell Atlantic (based in the North East) brought together not only disparate market territories, but also different business processes, systems and organization cultures. The announced expense synergy to be achieved by 2003 (which include wireless) amounts to $2 Billion. Organizational consolidation is underway even today with many systems and sub-groups within the organization in the process of achieving full coordination. The post merger complexity of mega mergers also compounds the difficulty in capturing the scale benefits.

Despite the limited scale impact, the economic benefits of mergers include cross-organization adoption of best practices in real estate management, outsourcing, reengineering of outside plant, procurement, and elimination of redundant G & A functions. However, until now, carrier efforts to derive merger synergies have focused primarily on the adoption of best practices in order to reduce costs. The relative lack of attention paid thus far to scale creation suggests that the unrealized potential for merged entities may be especially significant. However, as we indicated elsewhere (Katz and Sarma 2003) demonstrations of meaningful scale economies at a micro level (within company, across time or regions).

Much less quantifiable, but perhaps more significant, are potential scope-driven opportunities on the revenue side. To date ILECs have created little to no revenue synergy. Although there are many reasons for this, one of the fundamental causes has been the difficulty to align strategic objectives across functional, product and geographic organizations. As a result, unresolved conflicts emerge and prevent players from fully realizing post-merger benefits. Among these conflicts are:

- Cost-focused network and operations tension with revenue-focused market/channel organizations
- Geographic tensions – central vs. decentralized, national accounts vs. regionals, etc.
- Product-focused tensions between wholesale and retail, wireless and wireline, legacy and next-generation

Buffeted by new technologies (e.g., wireless substitution) and competition, ILECs must look to offset challenges with services such as enterprise long-distance, wireless/wireline convergence, high-speed Internet access, and bundling of broadband and application solutions. This strategy is essential for all incumbent carriers that are now confronting for the first time net declines in total number of access lines. The key to improving the ILEC's current financial structure lies in relieving the underlying
tensions across functional and product organizations – and thereby gaining access to untapped economies of scale and scope. In sum, ILECs need to focus simultaneously on cost and revenue synergies (Hyman, 2001).

These changes will require the ILECs to create a new operating model that will drive revenue with enhanced customer-acquisition and delivery capabilities (e.g., a knowledge management platform to improve sales efficiency) and the ability to rapidly innovate and effectively sell higher-return, value-added solution-based offerings (e.g., outsourcing, out-tasking/professional services). In addition, the operating model should reduce organizational tension and foster cross-functional approaches to creating new offerings and serving customers effectively.

While horizontal mergers in the wireline industry might not be necessarily beneficial, by distance, local and wireless integrators could prove to become a powerful ROIC boost. A merger that aims at achieving integration across sectors, resulting in tight linkages between local, long distance, and wireless, both voice and data, could potentially result in additional market power derived from economies of scope benefits. Among these, we can mention the ability to target a customer base with a multiplicity of products bundled around price discounts, distribution, customer care, and seamless solutions concepts. Among the product concepts, carriers will consider wireless/wireline minutes bucket price plans, reach me/follow me single phone numbers, unified wireless/wireline messaging, single bill, etc. According to this, we believe that the potential for revenue impact of bundling elasticities and customer retention could be important. In addition, the potential to achieve cost reductions based on back office synergies (e.g. billing, collections, care, G&A, and even network operations) could also be significant. This could trigger a lift in ROIC for vertically integrated carriers.

Having said this, bankruptcy laws, shareholder agreements and intra-organizational tensions (wireless/wireline divisions) could stand in the way of achieving this objective.

III.1.3. Promote development of markets for intermediate services:

The consolidation of the industry into a few oligopolies would face the risk of perpetuating economic inefficiencies in the provisioning of a number of support functions, either through the perpetuation of legacy infrastructure or the limited implicit innovation (de Fontenay, Savin & Kiss, 2003). Given the ongoing margin pressure incurred by telecommunications operators, it is critical to foster the development of intermediate markets for the efficient provisioning of services, from engineering, network deployment, to systems development and maintenance, and data center and network operations.

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10 The majority of wireless operators in the US are subsidiaries of the leading wireline operators (Verizon Wireless, Cingular, Sprint PCS, and Alltel).
We believe that the need to reduce expenses is so important that incumbents will be incentivized to enter into outsourcing agreements that would result in an economic benefit, despite the potential for loss of marginal competitive advantage. Additional benefits of this objective would be to gain cost flexibility and access a more efficient provisioning of services.

However, two issues could stand in the way of promoting these arrangements:

• Fear of loss of control over key cost elements or differentiations of the customer experience

• Executional complexity and transaction costs

III.2. Implement a new operating paradigm:

According to the estimates provided above, while a massive consolidation and migration to a natural oligopoly structure could yield a boost in ROIC, this would not be enough for the industry to return its cost of capital on the aggregate. To address this imperative, carriers need to fundamentally transform the telecommunications enterprise with the objective of achieving a step-function change in production economics. Aimed at developing a drastically different operating model, this transformation should result in reducing operating expenses by 30% and capex by at least 30%. Achieving this kind of operating performance improvement requires implementing a fundamentally different operating model.

This new operating model represents a combination of three approaches:

• Dramatically reduce operating expenses and design the organization for cost flexibility
• Introduce changes in the organization that promote internal cross-functional cooperation
• Build flexibility and adaptability in the organization structure and business processes

III.2.1. Reduce operating expenses and design the organization for cost flexibility:

A reduction in the pace of revenue growth in the industry should lead to a reduction in overall operating expenses. The recurring costs burden of carriers is having a sizable impact of the operating performance of carriers. Furthermore, regulatory initiatives (i.e. UNE-P tariffs) have a significant impact on the ILEcs financial performance. The industry is currently spending in the aggregate $xxx billion in operating expenses. Specific cost categories such as Information Technology, Finance, Sales and Marketing are strong contributors to the overall burden. While carriers have all attempted to cut costs in the past three years, aggregate impact of this efforts have rarely exceeded 15% of total expenses. A parametric analysis of cost reduction impact
indicates that in order for carriers to return their capital in rates that exceed their cost of funds, operating expenses need to be reduced in approximately 30%.

As a consequence, in order to reduce the pressure on margins by the rate indicated above, telecommunications carriers need to substantially change their cost structure by simultaneously implementing, in a convergent fashion, a number of cost reduction initiatives:

- Outsource functions that are not critical to building competitive advantage, potentially including portions of network operations
- Resize general and administrative costs by delayering the organization structure, socializing best work practices, leveraging scale by consolidating regional units, as well as standardizing and automating discrete tasks
- Optimize the supply chain both in equipment and non-product related inputs, by centralizing the management of supply arrangements across functions and business units
- Reduce costs of the retail distribution networks

Each recommendation will be reviewed in turn.

III.2.1.1. Outsource functions that are not critical to competitive advantage:

An option for leveraging scale that is increasingly being considered nowadays is the outsourcing of key value chain functions of operators. The underlying economic assumption determines that by outsourcing a function, the operator leverages the economies of scale of the supplier of the service. Outsourcing, in this context, appears as the creation of a competitive market for the acquisition of services within an extended enterprise framework. In a reversal of Coase’s argument for vertical integration, the total costs (transaction and production) incurred in relying on an outside supplier are less than the costs of organizing the given function through direct management control. Markets would then be more efficient than vertically integrated carriers.

Research conducted among service providers indicate that outsourcing of even activities hitherto perceived as mission-critical is being seriously considered today. Having initially outsourced peripheral activities such as logistics and facilities management, carriers are increasingly seeking to outsource call center operations, data center operations, some support for IT applications development and maintenance (administrative and ERP systems) and billing operations. Network operations are still generally regarded by most operators as one of the key in-house activities, but even this area is under serious consideration for outsourcing. In general terms, outsourcing is becoming increasingly prevalent in functions with intense infrastructure impact (network operations, IT, billing) where separation is possible (operations rather than planning and development) (see exhibit 30).
Exhibit 30: Outsourcing Opportunities Along the Value Chain

A detailed view for one specific function – network operations for wireline carriers – indicate a number of activities likely to be outsourced (see Exhibit 31).

Exhibit 31: Network Outsourcing Opportunities
Among the opportunities that leverage scale economies of the supplier, we have identified:

- Network deployment, maintenance and operations for emerging technology platforms (e.g. VoIP, C2P)
- Field operations and maintenance for sub-scale markets
- Network construction, maintenance and operations for legacy infrastructure (e.g. circuit to packet migration)
- Force augmentation for large-scale network deployment (e.g. DSL installation)
- NOC support (24/7 or after hours only)

In the wireless industry, outsourcing of network operations is being increasingly considered. Even under the most cautious approaches to outsourcing, which entail subcontracting of maintenance and logistics for regional network equipment, while keeping supervision, data center and enabling mid-layers in house, significant scale economies can be achieved (see Exhibit 32).

Outsourcing of network operations offers substantial savings as a result of leveraging scale of the service provider, particularly if the provider manages more than one network. Among the key drivers of scale, we can mention:

Exhibit 32:

Exhibit 33:
Key Drivers of Economy of Scale With Partner(1)

- Reduce travel time due to increased density of sites per work-area (or even by performing work for two network operators BTSs at the same site)
- Merge quality control teams (same measurement cars/teams for multiple networks)
- Reduce amount of employees “on call” by merging work-areas and leveraging synergies with other stand-by services provided by outsourcer
- Reduction of over-capacity/capacity safety margin
- Merge warehouses - resulting in consolidated spare part stocks and reduced facility cost
- Reduce capital investments in maintenance & measurement equipment (reduced CAPEX)
- Reduced need for management and overhead functions

(1) We assumed partners maintain a second network of similar size

Source: Booz Allen Hamilton analysis

Three models depicting the relationship between carrier and outsourcing firm have emerged as likely (see exhibit 34).
Along these lines, outsourcing models are beginning to consider not only cut-and-dry transfer of functions from the carrier to the outsourcer firm, but also the reengineering of processes and redefinition of boundaries between the carrier and the outsourcer. According to this, not only would the carrier benefit from the scale of the outsourcer, but it would also reduce some of its internal redundant costs. For example, if the carrier outsources switch maintenance the equipment manufacturer that supplied the switches, why not extend the utilization of the field engineers to provide maintenance to ancillary equipment (e.g. DSLAMs not manufactured by the switch supplier) co-located with the switches? In reengineering the process of maintenance of network equipment, this approach is tackling Williamson’s argument that legacy-based vertical integration tends to restrict an industry’s ability to achieve the kinds of efficiency that could result from economies of scale and scope.

A problem that is potentially emerging that tends to neutralize part of the scale benefits of outsourcing refers to a situation where the outsourcer that profits from the scale by virtue of being an incumbent supplier of a given service might begin to raise transaction costs as a result of its market position. Under this situation, the aggregate costs (production and transaction) resulting from relying on an incumbent outsourcer might exceed the costs of performing that function internally. This situation has emerged in areas with strong outsourcing markets such as systems integration and ancillary IT services, where carriers are increasingly considering bringing those services in-house due to what they perceived as monopoly rents being extracted by the outsourcer.
III.2.1.2. Resize General and Administrative Costs:

With stagnant growth and increased price pressure, telecommunications carriers must quickly shift their focus to achieve step-change improvement in cost structures to yield attractive margins and returns on invested capital. In particular, demand-driven support functions (e.g., Finance, Human Resources and IT) must be oriented towards bottom line improvement. This requires a disciplined approach to cost reduction following lessons to be learned from other industries that have faced similar pressures.

In addition to deploying functional organization, carriers that aim at optimizing the cost imperative tend to rely on shared support services\(^\text{11}\). Companies in industries such as utilities, automotive, aerospace and consumer products are turning to shared services organizations to wrestle with the provision of administrative and technical services. Several telecommunications carriers have also implemented shared services in some key functions (e.g. ATT and Verizon). The shared services model provides companies with significant opportunities to reduce cost and hone business unit focus. However, Shared Services have also received a fair amount of criticism, as many companies that claim to have implemented these models have not realized the desired benefits. Typically, we find that most companies misuse the term “shared services” to refer to centralized and fully insulated staff support functions rather than independent, market-focused, accountable service providers. In fact, “shared services” should not be just a new name for a cost center.

When a company chooses to organize around shared services, it tends to consolidate support functions from headquarters and business units into a single organization. Rather than functioning as an arm of the central hierarchy with costs allocated to the rest of the organization (as in the case of the majority of the functional organization structures currently in place at most telecommunications carriers), this new support services delivery organization collaboratively plans requirements and pricing with its internal business unit “customers.” The fundamental principles of shared services noted in exhibit 35 impose market-like discipline and incentives (via increased contestability of services and the use of price) in the provision of internal support services.

\(^{11}\) Kocourek, P, Couto, V., Hyde, P. and Dunn, L. Getting Shared Services right: capturing the promise. Booz Allen Hamilton, 2000
Exhibit 35: Successful Shared Services Relies on Market-Like Mechanisms

<table>
<thead>
<tr>
<th>Shared Services Principles</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price Transparency</td>
<td>Each service has its price. The business unit determines how much, if any, it wants at that price.</td>
</tr>
<tr>
<td>Business Management</td>
<td>The service is managed as a business, not a fixed overhead. It exists to serve internal customers.</td>
</tr>
<tr>
<td>Market Responsiveness</td>
<td>Service levels are determined by what the users want, not by what support staff thinks they need.</td>
</tr>
<tr>
<td>Best Practices Proliferation</td>
<td>Internal and external best practices are continually identified and, if appropriate, incorporated.</td>
</tr>
<tr>
<td>User Governance</td>
<td>Users have the dominant voice in setting standards and processes for commercial interaction.</td>
</tr>
<tr>
<td>Service Culture</td>
<td>Support services exist to serve the business needs of the users, proactively as well as reactively.</td>
</tr>
</tbody>
</table>

Commercial discipline keeps shared service providers in line, while also tempering out-of-line demands of internal customers. No longer a “free” good, services are now products with costs and benefits. Corporate and profit center customers make tradeoffs accordingly, with an explicit appreciation for the true economic impact of their choices. The service providers become not only vendors to the internal customers, but also expert advisers on what services may best suit the business needs of the customer and whether they should be sourced internally or externally.

III.2.1.3. Optimize the supply chain:

**Inefficient supply chain.** The wireless supply chain continues to be cumbersome and inefficient, with each operator managing an excessive number of touches, SKUs, and points of sale, as well as supporting low-value activities such as in-store replacement and customer care. Having six to seven competitors by market also ensures a significant degree of duplication in logistics functions, such as warehousing and inventory management. Finally, standard practices to increase the levels of efficiency in the supply chain, such as Sales and Operations Planning (S&OP), Collaborative Planning, Forecasting, and Replenishment (CPFR), which are common in other industries, are only just beginning to be practiced in wireless.

**Redesign the supply chain.** By our calculations, the wireless industry generates between $2B and $3B in excess costs and uses up to $5B more working capital than it needs, due to the complexity in its supply chain structure. In addition, demands on the supply chain are increasing as more returns, repairs, and upgrades (all of which require reverse logistics) must be handled for ever-growing replacement sales. Operators, working with suppliers and retailers, have an opportunity to apply many of the lessons that other categories have been pursuing for many years. Supply chain management approaches such as Sales & Operations Planning (S&OP), which balance the conflicting
objectives of Sales, Distribution, and Finance, help to minimize inventory for desired customer service levels. The wireless industry can adopt collaborative manufacturer-retailer practices pioneered by the packaged goods industry such as Efficient Consumer Response (ECR) and Collaborative Planning, Forecasting and Replenishment (CPFR). These approaches have delivered tremendous improvements in cost, service and replenishment time.

III.2.1.4. Reduce costs of retail distribution networks:

The list of problems that need to be resolved at the interface between the operator and the channel is large. To state a few:

- **Uneconomic company-owned stores and agents.** Many operator-owned stores are rapidly becoming uneconomic, as sales volumes slow down while fixed costs remain unchanged. Similarly, traditional agents are becoming less profitable and less effective relative to the marketing and sales support provided by operators to support them. Nevertheless, in the absence of an alternative channel, they are still maintained as a critical driver to generate new subscriptions.

- **Subsidy model unsustainable but hard to eliminate.** The practice of indiscriminately subsidizing phone sales is increasingly unprofitable for operators. The majority of phones now sold are for replacement purposes, while the small quantity of strictly new subscribers are likely to generate lower revenue and higher costs than their predecessors. Despite this reality, the high churn rate in the industry combined with the differing objectives of the various players, means that any operator that moves away from the subsidy model risks losing an unacceptable share of subscribers to more aggressive competitors.

- **Redefine role of company-owned stores.** Whereas in the growth years, company-owned stores could easily pay for themselves, in this new environment it will be critical to sharply define the different kinds of roles they play, and the mix of product and service delivered to each. We can consider a range of options:

  a) **Business-focused stores.** One important category will be stores refocused around the business customer. Business users are early adopters of many of the new wireless technologies and are increasingly in need of services - from linking their e-mail and time management apps to wireless through to enabling a secure WiFi connection. These were the early voice customers 10 years ago, and if operators can rediscover how to serve them out of selected stores, they will find a highly attractive proposition (high ARPU, low churn). In particular, for operators who are part of a fixed-telephony group, there may be value
in returning toward a model in which some of the stores carry multiple telephony products, aims at a selected target market.

b) Anchor stores. Certain stores will remain critical for brand-building purposes and to be at the vanguard of new products and trends, similar to the role that Nike stores have in supporting the overall positioning of its products. They would generally be located in major consumer traffic areas.

c) Niche/franchise stores. In certain markets it might make sense to have small, very focused stores, potentially leveraging a franchise model, that allow operators to generate sales with lower capital expense and requiring less volume to break even.

d) Distributors/hubs. In some industries, certain stores have become regional distribution hubs, in essence helping to support smaller stores in the area. This might be appropriate for markets that are small and hard to reach, or where there is a strong agent base that requires a lower-cost distribution channel.

e) Closed/shared stores. Ultimately, a number of the stores cannot be effectively repositioned, based on their volume. In this case, operators may need to close them or perhaps consider some radical solutions around sharing.

III.2.2. Redesign the organization structure:

In addition to responding to the economic pressure, telecommunications carriers need to improve their ability to respond to marketplace demands. Today consumers across the board are searching for integrated products and services. In the enterprise market, customers value the opportunity to build a relationship with an integrated supplier of telecommunications services that can provide a set of solutions that wrap the communications functionality around information technology within a single package. In the consumer market, customers are looking forward to the purchasing of bundled products, unified billing and single channel and customer service delivery.

The emergence of new customer requirements is putting pressure on the operating model of telecommunications carriers, since, in order to provide a seamless view of offerings to the customer, they need to build linkages across business units that have grown apart over the years.

The need to dramatically change the operating economics, and rebuild the linkages across business units with a focus on delivering the integrated services the customer wants is prompting the need for a new operating model among
telecommunications carriers. Implementing this kind of change implies shifting much of the way a telecommunications company conducts business, including the transformation of the full set of organizational levers from structure, to performance measures, to incentives, to processes, management systems and responsibilities. This is why we refer to the need for changing the operating paradigm. This change cannot be incremental, it should be dramatic; it is not conducted within each business unit, it requires a top-down vision; it cannot be led by middle management; it has to be driven by the CEO. It comprises the following changes:

- Integrate across all points of customer contact, both in sales and customer care
- Generate a holistic view of product management
- Differentiate the customer experience via new, open and transparent customer interfaces
- Redesign distribution and customer management around a solutions approach that comprises bundling of products (see revenue strategies below)

The imperative to position a telecommunications carrier as a service provider that addresses a full set of tailored customer needs has been tackled before by other industries, such as retail banking, consumer goods and automotive. In fact, the strategic imperative to deepen penetration of the current customer base is well understood across all these industries. Building customer centric organizations requires repositioning the business around offering a seamless continuum of products within a solutions framework. For a bank, this means to transition from a provider of transaction services to a partner in wealth creation; for a telecommunications company, from a carrier to a provider of communications services “anywhere and whatever”.

In light of the experience of other industries, we believe that the critical enabler to achieve this new strategic position is the organization structure and corresponding business processes. After understanding the customer requirements (e.g., define the segments, value propositions, product sets, etc.), service providers need to modify their internal processing architecture from product to market-oriented, so they can get a really differentiated set of economics for each market segment.

There are four key thrusts are required to implement customer centric organizations:

- Differentiate the customer experience via new open and transparent customer interface
- Redesign distribution and customer management around the solutions concept
- Develop a segment aligned delivery model that has genuinely differentiated economics by segment
Differentiate service from competitors by getting execution right the first time (a bundle handicapped by poor delivery is worse than excellent discrete products)

Delivering on these thrusts implies a fundamental transformation of the enterprise. The organizational underpinnings of a customer-centric operating model are depicted in exhibit 36.

**Exhibit 36: Customer Centric Operating Model**

**Organization Model 1**

*Customer as Primary Axis*

---

**Key Characteristics**

- Market-facing activities organized into Business and Consumer business units
- Sales, Marketing and Customer Care specialized by customer segment and delivered from within customer-focused business units
- Operations delivered from a separate unit
- All scale functions consolidated into stand-alone functional organizations or in a shared services unit

Implementing a customer-segment structure represents a major departure from most of the current models in use by telecommunications carriers, requiring new roles and responsibilities at nearly every level of the business and new processes and procedures to operate effectively. It also fundamentally alters the operation of the business, as P&L rolls-up to segment heads and many functional units are subordinated to segment heads. The reward, however, is an increased focus on what may ultimately become a carrier’s greatest asset – the customer.
III.2.3. Postpone capital investments:

Rethinking the carrier organization and reducing operating expenses might not be enough to build sustainable businesses. How about a strategy whereby operators would postpone investment in their networks either because they believe the market should get what it pays for, or because they believe that investment in new network technology does not pay up?

The telecommunications industry is expected to invest in aggregate more than $50 billion in capital during 2003 either to keep up with minutes of use growth, upgrading its plant, and introducing new products (see exhibit 37):

Exhibit 37: Capital Expenditures in US Telecommunications

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>AT&amp;T</td>
<td>10,475</td>
<td>9,300</td>
<td>7,617</td>
<td>7,702</td>
<td>35,094</td>
</tr>
<tr>
<td>Sprint FON</td>
<td>4,105</td>
<td>3,751</td>
<td>2,668</td>
<td>2,180</td>
<td>12,704</td>
</tr>
<tr>
<td>Verizon</td>
<td>17,633</td>
<td>17,371</td>
<td>12,000</td>
<td>12,300</td>
<td>59,304</td>
</tr>
<tr>
<td>SBC</td>
<td>11,774</td>
<td>11,189</td>
<td>6,808</td>
<td>5,500</td>
<td>35,271</td>
</tr>
<tr>
<td>BellSouth</td>
<td>6,995</td>
<td>5,997</td>
<td>3,785</td>
<td>3,407</td>
<td>20,184</td>
</tr>
<tr>
<td>Alltel</td>
<td>1,165</td>
<td>1,232</td>
<td>1,223</td>
<td>1,304</td>
<td>4,924</td>
</tr>
<tr>
<td>Qwest</td>
<td>9,222</td>
<td>8,543</td>
<td>2,866</td>
<td>2,126</td>
<td>22,757</td>
</tr>
<tr>
<td>Total Wireline</td>
<td>63,756</td>
<td>58,927</td>
<td>36,967</td>
<td>34,519</td>
<td>190,238</td>
</tr>
<tr>
<td>AT&amp;T Wireless</td>
<td>4,425</td>
<td>5,643</td>
<td>5,475</td>
<td>3,000</td>
<td>18,543</td>
</tr>
<tr>
<td>Cingular</td>
<td>2,249</td>
<td>3,422</td>
<td>4,255</td>
<td>3,767</td>
<td>13,693</td>
</tr>
<tr>
<td>Sprint PCS</td>
<td>3,047</td>
<td>3,751</td>
<td>3,400</td>
<td>2,372</td>
<td>12,570</td>
</tr>
<tr>
<td>Verizon</td>
<td>4,322</td>
<td>5,006</td>
<td>4,562</td>
<td>4,009</td>
<td>17,899</td>
</tr>
<tr>
<td>Nextel</td>
<td>2,976</td>
<td>2,384</td>
<td>2,200</td>
<td>1,976</td>
<td>9,536</td>
</tr>
<tr>
<td>Total Wireless</td>
<td>17,019</td>
<td>20,206</td>
<td>19,892</td>
<td>15,124</td>
<td>72,241</td>
</tr>
</tbody>
</table>

Note: The total for the wireline industry includes RBOC investment in wireless properties; the wireless total excludes T-mobile; Verizon wireline excludes capitalized software.

Source: Annual Reports; Governalli (2003); Rethemeier (2003); Lehman Bros., Sanford Bernstein

Going forward, we expect the wireless industry to complete its 2.5G migration this year. Between 2004 and 2007, the industry is expected to conduct its migration to 3G, which will require an incremental capex of approximately $16 billion (Goldman Sachs, Morgan Stanley). This figure is in addition to the capital required to support traffic growth under 2.5 while the migration to 3G is completed (see exhibit 38).
Exhibit 38: US: Projected Capital Expenditures in Wireless

<table>
<thead>
<tr>
<th></th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maintenance</td>
<td>6,352</td>
<td>7,383</td>
<td>8,296</td>
<td>8,254</td>
<td>8,513</td>
</tr>
<tr>
<td>Capacity</td>
<td>11,496</td>
<td>9,761</td>
<td>7,623</td>
<td>3,768</td>
<td>3,295</td>
</tr>
<tr>
<td>Upgrade</td>
<td>2,380</td>
<td>675</td>
<td>1,133</td>
<td>5,323</td>
<td>8,806</td>
</tr>
<tr>
<td>Total</td>
<td>20,228</td>
<td>17,819</td>
<td>17,052</td>
<td>17,345</td>
<td>20,614</td>
</tr>
</tbody>
</table>

Source: Booz Allen Hamilton

Furthermore, between 2008 and 2011, at least the CDMA carriers would be considering migrating to 4G, which would require an additional $46 billion (this number includes capacity and maintenance capex). In all fairness, however, it is very early to consider whether 4G might happen by 2008, particularly in light of Japan’s delays to 2010, and Europe’s delays of 3G to 2003-4. Nevertheless, the question remains as to whether, in light of current ROIC, the industry can afford such an investment. The proposal is not to limit capacity capex since this would have and impact on service quality and consequently on minutes of use. The issue is around whether the industry can afford facing a new wave of infrastructure investment (3G) with still dubious incremental payback.

The same hard choices exist in the wireline industry. The four RBOCs are projected to spend $25.3 billion in capex (including wireless) for 2003. This represents approximately 15% of revenues, well below the 20% threshold one might consider appropriate for a capital intensive industry. Year to year decrease in capex for 2002-3 is approximately 11%. AT&T and Sprint FON’s aggregate capex represents approximately 16% of sales. In an industry where revenues are flat, the only lever to improve ROIC is to reduce CAPEX even further.

In light of this situation, it would be pertinent to consider some radical questions such as:

- Given the revenue uncertainties of wireless data (see Governalli, 2003), should the industry consider a delay in migrating to 3G, and using both 1x and GPRS to support the existing product set? This option would provide some necessary breathing space, capable of raising the anemic ROIC. The question remains whether, in doing so, the industry would be trading off the build-up of critical capabilities. The issue is particularly important because a slow-down in the process of technological innovation might not be a source of overwhelming concern. After all, it is reasonable to ask us whether the wireless industry needs to (or can) sustain the rate of innovation exhibited in the past years of expansion.
• Rather than continuing running a capex bill to support ever-increasing traffic at lower yields, should wireless carriers consider a further reduction in capital and the consequent decline in quality of service. Obviously, this could affect a carrier’s competitive position. However, if the customers attracted by low prices are willing to accommodate a certain degradation of service, the trade-off should at least be considered.

• Can the wireline industry cut its capex even further to align it with depreciation to maintain the asset base? The issue here would become where to cut. With exception of broadband, the sector is not facing a “fork in the road” comparable to 3G in wireless. However, given the relative disadvantage that DSL is experiencing compared to cable modems, would a withdrawal from DSL be an option?

III.3. Promote intra-industry collaboration:

In addition to reducing costs on a stand-alone basis, the industry needs to establish mechanisms and instances where telecommunications operators can cooperate among themselves in order to reduce costs:

• Share infrastructure
• Partner up to fulfill specific operating functions
• Build industry-wide for a that allow operators to enhance their negotiating position vis-à-vis other parties (e.g. regulators, equipment providers)

III.3.1. Pursue industry-wide network sharing agreements in wireless:

Redundant networks represent a sub optimal approach to managing capital expenditures. In this case, wireless operators are unwilling to promote sharing agreements beyond marginal areas of the network (e.g. rural highways) were network quality does not represent a key competitive advantage relative to the cost of deployment. However, if some network sharing industry-wide agreement could be defined beyond the current limited level, the industry could reduce aggregate cumulative capex expenditures between 2002 and 2007 from $ 105B to an estimated $ 103B12. In our case, we have assumed a gradual decrease ending in 4% reduction for industry-wide capex by 2007, and 2007 average operating costs from $28/sub to $26/sub13. This would represent a potential increase to 7.1% in ROIC by 2007.

12 Our experience indicates that whole network sharing agreements (i.e. resulting from a merger) could result in a capex reduction between 4 and 6%.
13 Our experience indicates that sharing agreements could elicit a reduction of up to 48% of network access opex, which itself typically represent 34% of an operator’s opex.
Until now, major agreements involve Cingular/T-Mobile spectrum sharing in NY and California, Cingular/AWE rural highway network sharing, and wholesale roaming across CDMA operators (Verizon/Sprint and Verizon/Alltel). The proposal entails fostering universal agreements across all areas of the network and geographies across players with different standard area interfaces:

- Joint Tower sites
- Shared Radio Access network
- Share network build-out
- Spectrum sharing

Our economic analysis estimates that up to 48% reduction in access network costs can be achieved when sharing wireless networks. This depends, however, on the degree of cooperation (see exhibit 39).

Exhibit 39:
Impact Of Infrastructure Sharing On Operator's Cost Structure

Radio network sharing provides a good example of cost savings opportunities (see exhibit 40):
The level of technical sharing of networks depends on the selected level of technical integration (see exhibit 41).

**Exhibit 41: Depth of technical co-operation**

<table>
<thead>
<tr>
<th>Value Components</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Switch + Router</td>
<td>7%*</td>
</tr>
<tr>
<td>Application Server</td>
<td>10%*</td>
</tr>
<tr>
<td>Backbone Transmission</td>
<td>3%*</td>
</tr>
<tr>
<td>RNC</td>
<td>7%*</td>
</tr>
<tr>
<td>Transmission BSS</td>
<td>5%*</td>
</tr>
<tr>
<td>Node-B</td>
<td>25%*</td>
</tr>
<tr>
<td>Antenna + Cable</td>
<td>3%*</td>
</tr>
<tr>
<td>Infrastructure</td>
<td>35%*</td>
</tr>
<tr>
<td>Site rental and operation</td>
<td>5%*</td>
</tr>
</tbody>
</table>

* % der Value Chain, without Service Provisioning

Source: Booz Allen Hamilton Analysis

For RAN-Sharing* specifically, a variety of options with different level of technical integration are offered by vendors (see exhibit 42):

* Antenna, cabling, some amplifiers; assumes power supplies and major electronics are integrated units and thus not shareable

Source: Booz Allen Hamilton analysis
We consider infrastructure sharing to be a highly advantageous approach to build economies of scale. While it requires a greater complexity in terms of inter-carrier coordination than the straightforward outsourcing, its potential to create efficiencies is quite dramatic.

At a maximum, the proposal could entail the creation of network companies closely held by a group of operators who, while preserving retail independence, purchase wholesale transport services from these entities. So far, neither of the two options described above affect the overall industry structure. A third alternative to leverage structural scale, pushes the infrastructure sharing option to its ultimate consequences, thereby resulting in an effective fragmentation of the industry’s value chain. As it has been widely discussed, high vertical integration has been a historical feature of most telecommunications industries around the world. However, the argument should be put forward that, in light of endemic hypercompetitive environments and the inability of the industry to consolidate in the short term, coupled with the challenges of technology evolution, there is an alternative to leverage scale that consists on reducing the level of vertical integration.

The concept entails the separation of the network from the retailing function, allowing each arm to optimize fundamentally different objectives (3). This move goes well beyond the conventional wholesale-retail move of single carriers. The model under consideration proposes the spinning off of the network function from several carriers (most applicable case would be wireless), and the consolidation of the network functions into a single transport entity, while focusing of the carriers on the retailing of product.
According to this, the network’s objective is to design and operate manufacturing operations with the purpose of optimizing cost per minute of use and quality of delivered product (e.g. coverage, drops/blocks, etc.). On the other hand, the retail companies focus on designing and delivering a compelling consumer experience at an attractive premium over manufacturing costs, without being constrained by operating needs.

The structuring of such a model would follow a scheme such as the one included in exhibit 43.

Exhibit 43:
Wireless Network Sharing Industry Model

```
Ownership/Control

Product Purchase

Retail Carrier V
100% 70% 15% 15%
Netco II
Rationale
Nextel offers Verizon a strong business position—
Verizon provides a long-term technology
Alltel is de-facto a retailer of Verizon’s network
Verizon is the largest and most stable wireless operator

100% 35% 20% 10%
Netco I
Rationale
T-Mobile gains cash and stops current burn
Cingular is eventually forced by spectrum position
Orange leverages AWS Netco to launch entry of global brand

Vertically Integrated
Rationale
Pursuing full wireless/wireline convergence
```

The scale advantages of such a model are obvious. This concept pushes to the limit network sharing as described in the prior section. In the case of wireless, we are talking about a maximum of three national networks selling minutes to six national retailers. From an economic standpoint, three networks as opposed to the current six represent reduced capex through improved capacity utilization and lower upgrade costs, and improved efficiency of existing assets. Furthermore, a shared network would result in improved operating metrics by providing better coverage and reduced network operating expenses by means of enhanced buying power and operating efficiencies (i.e. network maintenance). From a regulatory standpoint, the advantage of this model relative to a full merger remains its low level of contentiousness, and no requirement for FCC or DOJ approval. From a strategic standpoint, given the lower level of complexity relative to a full merger, this concept could accelerate the return to scale.
Facing this, the question might be raised: how different is this concept from the original U.K. model that divided the wireless industry between resellers and network operators? First, contrary to the UK case, all the retailers have equity on the network. As a result, no retailer would have any undue advantage of vertical integration (which was precisely the case when Vodafone and Cellnet entered the service provider arena). Second, since there is still scale and scope in retailing, this structure still presents a barrier to entry to new players, therefore limiting the amount of price competition. As recalled, the lack of survivability of service providers in the British case was linked to intense price competition driven by market fragmentation combined with price squeezing on the part of the network operators and limited integration between retailers and networks in fraud and credit management processes.

Having said this, we still recognize that some significant hurdles need to be tackled to achieve wide sharing of networks:

- Carriers' reluctance to share potential sources of competitive advantage (e.g. network quality)
- Risk that large players might extend the life of marginal carriers piggybacking on their scale
- Danger of reducing network resilience by eliminating redundancy
- Potential impairment of capital value

III.3.2. Create a wireless industry sponsored technical organization in charge of conducting testing and type approval on behalf of all operators:

Until now, each operator has its own facilities and staff in charge of conducting all testing and type approval of handsets/devices being provided by equipment providers. This results on redundant expenditures for activities with no significant impact on the competitive advantage of carriers.

The proposal entails creating an institution similar to CableLabs and originally Bellcore but focused on the wireless industry;

- Funded by all wireless operators
- Certifies equipment to be deployed in the network
- Conducts all handset/device testing on behalf of wireless operators
- Interfaces with equipment manufacturers for type approval issues

Support for the creation of such an entity is expected to be widespread. The critical issue relates to the institutional arrangements to be agreed upon as a foundation. As a starting point, we recommend the consideration of the following features:

- Not-for-profit
Recipient of federal funding
Cooperating with the FCC and the ITU
Linked to the National Bureau of Standards

The benefits of this initiative comprise expense reduction and a return to scale in R&D.

III.3.3. Create a joint venture owned by a group of wireless operators in charge of purchasing and refurbishing low-end handsets:

The wireless industry spends $5 billion a year in purchasing and/or refurbishing handsets. Each wireless carrier has its own processes and staff in charge of purchasing and refurbishing handsets. The proposal aims at sharing this function across operators, at least for low-end handsets, which, contrary to high-end devices, are not susceptible of yielding any competitive advantage driven by product differentiation:

- Negotiate bulk discounts with equipment manufacturers (beyond those currently in place for each player)
- Establish a common set of specs for prepaid handsets
- Build a single reverse logistic process for equipment refurbishing

The immediate benefits of such an initiative comprise a reduction in costs of handsets as well as generating the ability to introduce an extremely low cost handset for pre-paid customers.

The implementation of difficulties include:

- Executional complexity
- Coordination of multiple players
- Different vies of industry outlook across players
- Limited benefit to large carriers

III.3.4. Promote collaboration across wireline operators to enable the search for industry-wide solutions to information systems bottlenecks (e.g. billing, financial systems)

The wireline sector has been affected by an information systems bottleneck whereby operators have not been able to adequately solve the challenge of growing complexity of information systems requirements:

- Increasing complexity
- Untenable IT costs (driven by maintenance requirements)
- Ever-growing of Finance and accounting employees to keep up with the complexities of monitoring and reporting, given the difficulty of addressing them through information technology
Companies in the industry have attempted to address these difficulties on an on-going basis and have confronted both the extraordinary level of expenditures needed to incur to develop upgraded systems architecture, as well as the level of risk that a migration of such mission critical systems entails. The net result of this situation has been spectacular failures in the implementation of large scale systems, and enormous amount of wasted resources. The corollary of this state of affairs has been that most of the incumbent carriers have continued to rely on old information systems that have been “patched” over the years, and that they have had to grow their clerical staff to deal with the growing complexities of managing the business.

We contend that finding an industry-wide solution to this problem should not be attempted by each operator independently, but that a collaborative effort be set up to fund and develop a solution to this problem. According to this, wireline operators would create a consortium that would sponsor the research and development of common information systems platforms in the areas of billing, financial management, Operations Support Systems, and others. The results of this effort would be shared across operators, thereby allowing the industry to optimize the use of resources. Once those solutions are implemented, operators would have the ability to reduce clerical staff that would be replaced by information systems.
III.4. Significantly enhance corporate governance organization and processes:

In order to address some of the limitations of the current organization models in terms of limiting the potential for corporate malfeasance, we have defined a set of recommendations regarding the role of key bodies and functions:

- **Change the Role of the Executive Team:** Telecommunications carriers need to move away from staff-heavy executive bodies and towards leaner, business-focused managing structures and systems (i.e., Executive Committees). They must reorient the roles of corporate senior staff to serve the business units more effectively and efficiently, while also driving change across the enterprise within their own areas of responsibility. Corporate functional leaders must act as both master and servant, supporting the business units, while overseeing enterprise-wide change in their own areas of functional expertise.

- **Create executive leadership teams:** formed with members of senior management nominated based on skill, experience and maturity and not as functional representatives. Typically, they should include the CEO, CFO, Sector Regional/ Functional Heads and the COO. Effective interactions among executive leadership are the most important result of a well-functioning management system.

- **Implement red teams to monitor investment decisions:** The CEO should appoint red teams that are entitled to assess key decisions to ascertain their reasonability in terms of growing shareholder value.

- **Enhance role of corporate staff for review process and check/balance:** The Corporate staff (CFO, CTO, Chief Corporate Planner) responsibilities must expand well beyond administrative and functional duties to a central role in the senior management team. He or she must become the corporate watchdog, safeguarding its resources and actively challenging the business units to prove their cases for various investment programs. At some telcos, the CFO will need to have direct line authority and control enough of the corporate budget to take “fail-safe” actions to make plan14.

- **Put in place anonymous whistle-blower systems:** this systems would allow early warnings of corporate malfeasance to be reported to a neutral party resident outside the carrier organization. This entity could be attached to an existing agency, such as the SEC or structured as an independent ombudsman.

- **Ensure true independence of Board of Directors**

14 Neilson, G., Moran, M. and Hedlund, T. *The view from the top: Rethinking the roles of senior management*. Booz Allen Hamilton, December 2002
• **Build a new corporate culture:**
  - Standards/ expectations of openness declared and enforce
  - Establish primacy of corporate strategy and financial objectives
  - Adopt style that rewards challenge

This set of modifications to corporate governance would have an influence in increasing investor confidence.

**III. 5. Put in place strategies aimed at growing revenues:**

In an industry context characterized by slowing growth, technology substitution, declining prices and sluggish economic drivers, few revenue options remain open to foster growth purely driven by demand increase (comparable to wireless between 1990 and 2001). Household communications spending has not grown in the past five years. Access lines continue to decline because of broadband substitution of second line and wireless affordability/improvement of network coverage. Household spending in long Distance has declined 25% between 1997 and 2002 due to price decreases. Similarly, average revenue per wireless user has declined 30% due to price competition (see exhibit 44).

### Exhibit 44: US Wireless Revenues

<table>
<thead>
<tr>
<th></th>
<th>1998</th>
<th>1999</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cingular</td>
<td>$6,000(E)</td>
<td>$8,000(E)</td>
<td>$12,000(E)</td>
<td>$14,268</td>
<td>$14,727</td>
</tr>
<tr>
<td>Sprint PCS</td>
<td>$1,294</td>
<td>$3,373</td>
<td>$6,341</td>
<td>$9,726</td>
<td>$12,006</td>
</tr>
<tr>
<td>T-Mobile (Service Revenues)</td>
<td>$475</td>
<td>$928</td>
<td>$1,808</td>
<td>$3,271</td>
<td>$4,539</td>
</tr>
<tr>
<td>Nextel</td>
<td>$2,295</td>
<td>$3,786</td>
<td>$5,714</td>
<td>$7,013</td>
<td>$8,715</td>
</tr>
<tr>
<td>Verizon Wireless</td>
<td>$6,641</td>
<td>$7,659</td>
<td>$14,222</td>
<td>$17,393</td>
<td>$19,260</td>
</tr>
<tr>
<td>AWS</td>
<td>$5,406</td>
<td>$7,627</td>
<td>$10,448</td>
<td>$13,610</td>
<td>$15,594</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>$225,167</strong></td>
<td><strong>$247,549</strong></td>
<td><strong>$269,785</strong></td>
<td><strong>$285,160</strong></td>
<td><strong>$277,168</strong></td>
</tr>
</tbody>
</table>

*Source: Company Reports*

On the other hand, Enterprise telecommunications spending is stable due to five factors:

• While data traffic is growing, voice is stagnant, and significant voice-data substitution is underway
• Slow down in economic growth is limiting increase in capacity spending
• Companies are rationalizing their bloated telecommunications infrastructure
• Enterprises are still assimilating the wave of product innovation that hit the market in the past five years
• Even when new products are adopted (IP-VPN) they are done with the objective of reducing spending from legacy technologies (frame relay)
As a consequence, there are no silver bullets or “killer applications” susceptible of achieving a significant growth in revenues purely based on demand fundamentals. Superior financial returns cannot be achieved simply by picking positions in more attractive sectors of the industry (which, by the way, do not exist). Furthermore, elasticity in wireless has fallen under 1, therefore price decline cannot be made up in volume. Finally, revenue growth can only be achieved at the expense of intermodal substitution (e.g. growth in cable modems is partly based on DSL churn, and both reduce second line growth, cable enabled VOIP would be achieved at the expense of local access lines).

In search for growing revenues, two strategies are open to carriers:

- Build skills, processes and capabilities aimed at creating loyalty and have customers buy the products they need and can pay. In order for this to happen, the industry needs to be more innovative not necessarily around product development, but based on the redefinition of the value/product equation. Along these lines, the industry needs to reinvent the way it deals with customers by enhancing the understanding of customer needs and behavior

- Grow the share of wallet of consumer telecommunications spending by:
  - Focusing on capturing a larger share of household and enterprise communications spending
  - Emphasizing introduction of bundles of telecommunications products that allow for flexibility of choice
  - Allowing for distribution channels to offer bundled offers through one-stop shopping outlets

III.5.1. Improve management of the customer base, by reducing churn or enhancing value generation of existing consumers:

Revenue growth in telecommunications has less to do with accelerating the rate of product introduction or finding a killer application and more with improving target marketing accuracy. Revenue growth can be achieved by building skills, processes and organization structures aimed at managing the customer base: reduce churn and improve matching of customer needs and products.

First, telecommunications churn is extremely high when compared to other industries: 30% of wireless subscribers change carriers every year; 25% long distance customers change carriers annually; between 30% and 40% change broadband operators. Changes in the regulatory framework such as the introduction of number portability in wireless could increase churn. Part of the churn is driven by the industry structure. It requires, in average $368 to acquire a wireless customer, and $421 a broadband customer.
Secondly, there appears to be limited fit between customer needs and services purchased. It is a common occurrence that consumers do not necessarily buy the services they need, be it the right wireless price plan or the most suited bundle of CLASS services. The problem with this situation is that it can potentially lead to either churn due to “sticker shock” or the inability of a carrier to realize the full potential of a relationship due to under-purchasing of services. Around 30% of wireless customers tend to purchase the wrong price plan (which results in either sticker shock and consequently either churn or bad debt).

The corollary of this situation is that, under the current market conditions characterized by slower growth of the customer base, a revenue growth strategy should be directly linked to an effective management of the existing customer base, rather than acquiring more customers (see exhibit 45).

Exhibit 45: Alternative Product/Market Strategies

<table>
<thead>
<tr>
<th>New Customers</th>
<th>Existing Customers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Difficult because of slow market growth</td>
<td>Product/market mismatch can lead to either churn or unrealized value</td>
</tr>
<tr>
<td>Key value opportunity</td>
<td></td>
</tr>
</tbody>
</table>

Product/market mismatch can become a huge liability in the context of hyper-competition, whereby carriers are continuously introducing new services to respond to the competitive threat. As an illustration, the migration of customers to a lower end price plan introduced in response to competitive pressures can have a negative impact on the average revenue per user if existing customers tend to migrate to the lower end price plan. Along these lines, is there a potential approach to provide a response to the competitive threat while reducing the cannibalization risk? Expanding on this question:
• How to assess revenue at risk from migration?
• How to measure the impact of new price plans on migration risk?
• What approaches to customer management can best reduce the downside risk and increase the upside from migration?

From a revenue generation standpoint, similar kind of questions can be raised:

• How to track faster and more precisely the impact of new products on the value of the customer base?
• How aggressively should a player match competitor moves?
• How to optimize the acquisition of the most valued customers?

The problem in dealing with these issues is that many of the actions operators take to grow revenues are in fact value destroying, whereby any potential revenue uplift gets diluted. This situation is very common across industries, where up to 2/3 of promotional events and new product introductions result in negative ROI (see exhibit 46).

Exhibit 46: Return on Investment of Promotional Activities

According to this, deployment of revenue growth strategies in telecommunications has, in our view, less to do with accelerating the rate of product introduction, or improving the product development process, and more with building the right
capabilities to enhance market targeting accuracy, accelerate speed of response, and generate appropriate market feedback. This approach to building marketing effectiveness capabilities should have a direct impact on revenue growth capabilities. It is comprised of five building blocks (see exhibit 47):

Exhibit 47: Marketing Effectiveness Capabilities

- Analytical Engine
  - Behavioral Customer Segmentation
  - Understanding of decision-level profitability
  - Predictive response tool
- Information Systems
  - Planning and post-event tracking tools
  - Data warehousing/architecture
  - Systems interfaces
- Transformation Process
  - Set targets
  - Establish vision
  - Pilot early
  - Demonstrate success
  - Create champions
  - Build momentum
- Policies/Processes
  - Target-setting
  - Marketing package parameters
  - Marketing package planning
  - Post-event analysis and tracking
- Aligned Organization
  - Roles/accountabilities
  - Incentives
  - Skills and training

Building capabilities for growing revenues entails three of these five areas:

- Develop systems that allow daily capture of critical customer information to determine the potential impact of marketing events (e.g. promotions) on lifetime value
- Build predictive models that can efficiently generate individual lifetime value profiles, and assess impact of marketing policy changes
- Develop a set of processes for each market segment that optimizes segment value based on best knowledge of customer behavior and economics

Our experience indicates that while most telecommunications service providers have one or two of these capabilities, they come short on the remaining ones. It is common to observe companies that have installed CRM systems, but lack the analytical skills to conduct the in-depth analysis of the customer base to understand needs or assess the potential impact of a new product. Conversely, we have also observed carriers which developed sophisticated analytical engines and they came short in the implementation of the appropriate organization roles and responsibilities, training
hiring, incentives and operating model to ensure that the new approach to manage the
customer base is established within the organization.

In conclusion, given the speed of competitive dynamics and the market volatility,
it is very difficult to deploy a sustainable revenue growth strategy based on a specific
set of products or market positioning. The only answer, in our view, is building the
market driving capabilities needed to gain a better understanding of customer needs
and achieve a better matching between offerings and market needs.

III.5.2. The bundling concept as a strategy for growing share of wallet:

In the past six months, incumbent carriers in the United States are introducing
increasingly complex product bundles of voice, data and call management features as
part on an effort to build customer loyalty and reduce churn while increasingly capture
a larger share of wallet of existing customers (see 48).

Exhibit 48: Carriers currently offering telecommunications bundles
(Selected Examples)

<table>
<thead>
<tr>
<th>CARRIER</th>
<th>LOCAL</th>
<th>L.DISTANCE</th>
<th>WIRELESS</th>
<th>BROADBAND</th>
<th>OTHER</th>
</tr>
</thead>
<tbody>
<tr>
<td>BellSouth Answers III</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>Privacy</td>
</tr>
<tr>
<td>SBC Solutions</td>
<td>X</td>
<td>X</td>
<td>(Selected States)</td>
<td>X</td>
<td>Yahoo Inside wire CLASS DISH</td>
</tr>
<tr>
<td>Verizon Variations All</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>Caller ID Call Waiting</td>
</tr>
<tr>
<td>Qwest Total Package</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
<td>CLASS</td>
</tr>
<tr>
<td>AT&amp;T Digital Phone</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td>Caller ID Call Waiting</td>
</tr>
<tr>
<td>MCI Neighborhood</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td>Call Waiting Caller ID Speed Dial Three-Way Enhanced V-mail</td>
</tr>
<tr>
<td>Broadwind Complete</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td>Caller ID Unified Messaging</td>
</tr>
<tr>
<td>Connections</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: the bundles mentioned above are the widest ones in terms of choices.
Sources: IDC (2003); Company Releases; BAH Analysis
All carriers offer bundles as menus with different choices and levels of use. Their intention is threefold:

- Reduce pricing pressure in the local and long distance voice markets by building loyalty and reducing churn
- Capturing a larger share of household communications spending
- Face the potential encroachment of cable (see exhibit 49).

**Exhibit 49: Bundles offered by the cable TV industry**  
(Selected examples)

<table>
<thead>
<tr>
<th>CARRIER</th>
<th>LOCAL</th>
<th>L. DISTANCE</th>
<th>WIRELESS</th>
<th>BROADBAND</th>
<th>OTHER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cox San Diego</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
<td>Digital Cable A la carte</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>vs. 17% bundle discount</td>
</tr>
<tr>
<td>Cox New Orleans</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td>Cable TV</td>
</tr>
<tr>
<td>RCN Resilink Platinum</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
<td>Digital Cable A la carte</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Inside wiring</td>
</tr>
<tr>
<td>Charter Communications</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td>Digital cable</td>
</tr>
<tr>
<td>Cablevision Optimum</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
<td>CLASS Digital Cable</td>
</tr>
</tbody>
</table>

Source: Booz Allen Hamilton

In fact, bundling is not a new concept for the telecommunications industry. The notion of bundling has been erroneously attached almost exclusively to the creation of packages of existing products aimed at growing the share of communications spending of a household and/or raising a customer’s barriers to switching operators. In fact, bundling is a much more complex concept which can be considered not only as a packaging of stand-alone products, but also as a combination of channels (see Exhibit 50).
According to exhibit 48, bundling can assume different patterns depending on the level of integration of either channels or discrete products. At the lowest level of integration, a carrier offers separate independently priced products through independent channels. This is to some degree the current situation in the wireline/wireless industries. Originally driven by regulatory constraints (e.g., structural separation between regulated and semi-regulated markets), this tendency was reinforced by the financial reengineering maneuvers of the late 1990s, whereby carriers spun-off their wireless subsidiaries to capture the upside of exuberant stock market valuations.

A very low level of bundling entails the offering of separate products over a single channel. Offerings are kept independent, pricing is discrete, and the objective is to meet the market demand for single point of sale. The underlying assumption behind this approach is that customers value the convenience of access potentially more than the search for the best available product being offered in the marketplace. Initially pioneered by the banking industry in the late 1980s, it resulted in the financial supermarket concept, whereby customers would go to the bank branch to attend to the transaction needs of their checking accounts while considering at the same time refinancing their mortgages, buying insurance, rolling CDs, or investing in the stock market. The repeal of the Glass-Steagall Act enabled the full-fledged introduction of the concept. From an operating standpoint, the concept was quite appealing because it required a very low level of integration: the “store within the store”. According to this, customers would be directed to a kiosk located within the branch to purchase the newly introduced product. However, the banking industry promptly discovered that while customers appreciated one-stop shopping, they valued more the ability to get the best possible mortgage rate or the most optimal return on an investment product. The corollary of this concept was that, in order to make bundling attractive, service
providers needed to compete on price and enhance the value of the bundle by building some level integration across discrete products.

This led to the emergence of two concepts: cross-promotions and bundled products. A cross-promotion entails basically the offering of discrete products linked by the opportunity of getting a discount if they are bought in tandem. Cross-promotions were a classical entry point of the telecommunications industry bundling craze in the 1990s. They were particularly attractive because they still did not require a high level of operating integration. Discounts would be given at the point of sale and lists of customers purchasing two or more products would be shared across billing systems. Cross promotions would also be offered through a single channel, such as the “store within the store”.

A different approach to bundling entailed packaging of products beyond discounting, while offering them through independent channels. This concept represents a change in the value proposition. While one-stop shopping is predicated on the convenience of purchasing, and cross discounting points to the economic advantage, the premise of packaging is that the combination of two or more products yields a combined value that is bigger than the sum of the parts. Obviously, for this to happen the package has to offer something more than just discounts. This is where concepts such as unified messaging, single bill (or statement for the banking industry), and single point of access to the call center for care purposes were developed. This represents a step-function change in operating complexity. It requires sophisticated interfaces between transaction processing systems (although in some cases, work-arounds can be developed like the “stapled billing statement” to mimic the single bill). It also entails the design of highly complex business processes, such as hand-offs of customer care calls coming into a single point of access to customer service pools that can actually deal with the product-specific inquiry (training customer service representatives to deal with inquiries regarding all products would prove economically unfeasible). While products are bundled, distribution can be handled through separate channels. The rationale for such an approach (bundled products sold through independent channels) could be manifold: the bundle could have been a result of a strategic alliance between two independent firms that would continue to offer it through their own channels; or, alternatively, the bundle is offered as a result of an agreement between a wireline carrier and its partially owned subsidiary; a prior spin-off prevents the consolidation of channels.

The most ambitious level of bundling is the offering of bundled products through integrated channels. At this point, bundling in product packages has been pushed throughout most stages of the carrier’s value chain, with the consequent impact on the level of operational complexity. The operating execution of such a bundling strategy requires integrating functional smoke-stacks (see exhibit 51).
To sum up, bundling, in its various incarnations, is conceived to meet a variety of potential customer needs:

- Convenience of single point of purchase
- Cross-discounting
- Solutions (“whole is bigger than sum of the parts”)
- A combination of the above

Research on the attractiveness of bundles among residential customers indicates high interest but only for selected segments. In research conducted among a large sample of residential customers (1,800) in the southeast of the United States, we found that:

- When offered a bundle as a menu comprising voice telephony, internet access, cable TV basic and premium programming, video on demand, home security, and energy management, 38% of consumers would buy at least one service. Along these lines, consumers value the choice that a menu of offerings would entail.

- Conversely, if the bundle were to be reduced and presented not as a menu but as a set of “all-in” services, penetration would drop:
  - Voice telephony, internet access, home security and energy management offered as “all-in” bundle would be purchased by 28% of households
If one were to add cable TV to the bundle above, penetration would increase to 34%; however, it would never reach the penetration achieved if consumers were to be offered a menu to chose from.

- This appears to confirm the original finding from the banking industry that bundles have some pull, but in the end consumers will search for “best of breed”, whether those mean mortgages with lower rates or communications services that are cheaper or offered by a provider commanding higher brand equity. The bundling strategy of incumbent carriers, which provide a range of “menus” (e.g. Verizon’s Veriations basic, with wireless, with DSL, All; BellSouth’ Answers I, II, and III), is an effective answer to this particular consumer need.

- In this vein, despite the range of services included in the bundle (from media to communications), consumers tend to cluster discrete offerings around a perceptual map that comprises two “sub-bundles”:
  - A “utility” bundle that comprises telephony, home security and energy management
  - An “entertainment” bundle that includes basic and premium TV programming, video on demand, and Internet access

- Interestingly enough, consumers among certain socio-demographic categories are not inclined to purchase bundles; reasons for the lack of attractiveness include:
  - Reluctance to assign a single service provider leverage over the total communications services purchasing within the household; along these lines, the notion of potentially incurring a late payment situation resulting in a disconnect of all services from telephony to entertainment exhibits a high level of “concentration risk”
  - The notion of consolidating purchase of all services from a single services provider to be paid through a single bill not only generates “sticker shock” but also prevents the head of household from managing cash, by scheduling payments along the month15

- As expected, upscale segments are the most prone to purchase a full bundle than lower socio-demographic groups
  - Households with incomes above $100,000 exhibit a high willingness to purchase services from a menu (54% uptake on any combination)

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15 Apparently in response to this, Cox offers consumer friendly billing, according to which consumers have the opportunity to designate when they will receive their bills during the month, and also have the option to split the billings for services throughout the month. The question remaining is whether the impact of this flexibility on the economics of billing justifies the option.
Conversely, households with incomes under $50,000 exhibit a very low willingness to purchase any services under a bundled offer (25% uptake of any service)

The results of the Booz Allen study are quite consistent with research conducted in 2002 by IDC among US residential customers. According to this:

- Forty-two of 900 respondents indicated they are interested in purchasing multiple telecommunications services bundled together from a single provider
- Bundle attractiveness is consistent with the perceptual map found in the Booz Allen study, according to which consumers tend to isolate two clearly differentiated sub-bundles:
  - Forty-one percent of respondents indicated that they were most interested in having local service included in a bundle
  - Thirty-eight percent expressed interest in a bundle that would include long distance
  - After these two services, there was a considerable drop-off in attractiveness, with cable TV scoring an attractiveness rate of 14% and internet access rating only 16%

To sum up, at least 48% of the consumer market is interested in purchasing bundled telecommunications services. However, interest is not as high in terms in wide horizontal mega bundles, but rather in packages that map the consumer’s perception of a subset of logically linked services.

It is difficult to ascertain yet, whether there is different potential between the telco bundles which represent the consumer’s “utility” perception of the package and the cable bundle, which merges “utility” and “entertainment” value propositions. The issue is particularly relevant because a survey of the marketing literature of cable telephony providers indicates that their primary competitive differentiation is spelled around price discounting rather than the value of the bundle. In other words, if cable telephony providers compete purely based on price (“me-too CLEC approach”), and residential consumers are not particularly keen on packaging utility and entertainment, the strategic implications for the telcos are two-fold:

- Do not consider following cable players in the content/entertainment arena (see SBC’s attempt to bid for Direct TV)
- Emphasize bundle power of utility communication elements (local, long distance, wireless, broadband access) and compete on price on the telephony side
An assessment of the attractiveness of bundles needs to be tackled from several perspectives:

- Do they enhance a carrier’s ability to capture market share?
- After all costs are factored in, do they result in an enhancement of customer profitability?

Evidence of the value of bundles in capturing share is mixed. We evaluate success in terms of two dimensions: market uptake, and profitability. Evidence of market uptake has always been, even in the mid-1990s when Telewest launched the first cable telephony service in the U.K., positive. In that particular case, the carrier achieved up to 30% share in those franchises where they were offering combined cable and telephony service.\textsuperscript{16}

In the recent launches in the US, telcos have achieved significant impact. For example, Sprint reported that their wireless service achieves a 50% higher penetration level when paired with wireline service than when it does not have such a bundle. Less surprisingly, Sprint achieved a 46% long distance penetration rate in its residential local markets, about five times its national rate. On another example, Broadwing reported that benefits to be derived from bundling range from market impact to improved customer information (see exhibit 52).

<table>
<thead>
<tr>
<th>Area</th>
<th>Effect</th>
<th>Market Evidence (Broadwing)</th>
</tr>
</thead>
</table>
| **Product / Service Bundling** | Improved customer retention due to higher switching costs of moving to another provider  
High subscriber growth rate due to attractiveness of the plan  
Decrease in the impact of wireless substitution | High residential penetration of bundled offering within the 1st year (22%), with sustained endurance (current penetration = 28%)  
Lower than average churn (2.6% in '02) in a highly competitive wireless market (7+ players)  
Minimal total access line decline of 2% from 2001 to 2002 |
| **Cost**              | Cost savings from consolidating key support function costs (G&A, Billing, and IT)  
Reduction in network related charges (e.g., interconnection) and improved utilization of both networks | *Detailed Market Information Not Available*                                                 |
| **Customer Service**   | Superior customer service through observation of customer behavior across several products      | Number 1 ranking for best Local Residential Telephone Customer Satisfaction in JD Powers customer satisfaction every year since the launch of the bundled products |

Sources: Company Reports, UBS, Yahoo, Booz Allen Analysis

\textsuperscript{16} It should be noted however, that initial share captured dropped dramatically after BT launched a grass-roots winback campaign
On the cable side, Cox has reported a reduction in churn for those customers that take the cable, broadband, telephony bundle: average monthly churn for cable only subscribers is 1.7%, while churn for bundle subscribers was 0.8%. Similarly, Charter Communications reported that digital video customers purchasing cable modems churned 32% less than digital video only customers,

While the benefits on uptake and loyalty appear to be clear so far, the issue of customer profitability, both on the acquisition and over the life of the customer appears to be relevant. However, in this case, the publicly available evidence is non existent. We have developed an approach to calculate the profitability of a bundle that takes into consideration the margins of each discrete product (before channel costs) and subtracts the channel costs incurred from selling the package (see exhibit 53):

**Exhibit 53: Economic Analysis of Bundles**

<table>
<thead>
<tr>
<th>BUNDLE MARGIN (Before Channel Costs) – Channel Costs = Pre Tax Margin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monthly revenue*Margin % (before Channel cost)*Lifespan for each discrete Product</td>
</tr>
<tr>
<td>Bundle sales costs + advertising by channel+ systems by channel+ Fulfillment</td>
</tr>
</tbody>
</table>

According to this approach, the bundle margin tends to substantially decrease because its acquisition costs are much higher than the ones for discrete products. This is driven by a number of variables:

- In order to adapt a channel to sell a bundle, carriers have to introduce changes in targeting, appearance, etc., which have economic implications

- The efficiency of classical consumer channels, such as outbound telemarketing, tends to reduce greatly when shifting from discrete offerings to bundles

Offering bundles entails business risks as well. For example, a carrier with operations in cable TV and wireless launches a promotional offer of wireless service among its cable TV subscribers. The business case is relatively straight-forward: take the lists of current cable TV subscribers and rely on outbound telemarketing services to cross-sell a wireless offer. Surprisingly, the campaign yields extremely low customer profitability: customer acquired through cross-selling yielded almost half the net return compared to wireless only customers that had been acquired through other conventional channels, such as dealers. What happened here? The failure occurred at the point of sale. The telemarketing representative was given a task to up sell wireless
to cable TV customers. Once the targeted customer accepted to purchase, the rep tended
to assign them to a wireless calling plan that did not correspond with the customer’s
level of affordability (which the rep could not evaluate for lack of customer
information). The customer started using the wireless service, incurred a high bill, could
not pay it (credit checking was waived because they were current customers), and were
disconnected, resulting in an uncollectable. This experience indicates that even
straightforward cross-selling campaigns can yield negative results if they are not
organized with the appropriate acquisition safeguards.

Other risks are of an operational nature. As mentioned above, offering bundles
require not only integrated selling process, but also single “point of entry” for customer
inquiries, which need to be supported by integrated (or at a minimum front-ended)
systems. If the processes for answering a customer query are not in place, dissatisfaction
with the bundle, and indirectly with its discrete offerings, will emerge. This was the
case of a telecommunications carriers that entered into an alliance with a satellite TV
player to add an entertainment component to its long distance offer.

While the example cited above pertains to the mid-1990s, it appears that carriers
engaged in the current promotion of bundles are incurring in similar kind of problems.
For example, Broadwing has reported recently that pitfalls in the promotion of bundles
relate to organizational barriers standing in the way of selling and servicing packaged
offerings (see exhibit 54).

**Exhibit 54: Organizational Constraints to Bundles Success**

<table>
<thead>
<tr>
<th>Common Reasons Why Integrated Services Fail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimal overlap in service / product coverage</td>
</tr>
<tr>
<td>Ineffective management of pricing and cross-selling: tradeoff between incremental profit from cross sell and cost of the bundle’s discount must be managed</td>
</tr>
<tr>
<td>Failure to integrate across all points of contact – customer should be able to view the organization as one entity</td>
</tr>
<tr>
<td>– Retail / store</td>
</tr>
<tr>
<td>– Care</td>
</tr>
<tr>
<td>Not using customer segment based targeting</td>
</tr>
<tr>
<td>Non-holistic view to product development, with product development residing in siloed organizations</td>
</tr>
</tbody>
</table>

To conclude, evidence of the power of bundles to grow revenues by increasing
uptake appears to be directionally compelling. Furthermore, given the increased costs
in acquiring and servicing customers purchasing bundles, the profitability still remains
unproven. This is the case if carriers attempt to offer the bundles without significantly changing the business processes originating in traditional product-centric organizations. Furthermore, the operational complexities could potentially stand in the way of yielding not only revenues but also margins uplift.

As the risks encountered by some companies attempting to offer bundles indicate, deploying a strategy to grow revenues has direct implications on the need to equip a carrier with a different set of capabilities than the ones commonly referred to on the cost side. We will refer first to those capabilities needed to align products and market needs.

Strategies that focus on growing the share of wallet of consumers based on an improved alignment between segment needs and product characteristics require first and foremost a solid understanding of customer requirements. Data warehousing is being commonly referred to as the right platform to compile and analyze customer purchase and usage of telecommunications services. A variety of software tools have been developed over the years to facilitate this process (e.g. Siebel, SAS, etc.). However, in our experience, while customer data analysis is in need of these platforms, their installation is not a sufficient condition. Analytical capabilities and the organizational transformation required to translate findings into revenue strategies remain the critical building blocks.

In addition to developing a comprehensive set of capabilities for assessing customer requirements, bundling strategies require also a change in a carrier’s organization model. Experience in industries that have attempted building on the value of bundled offerings, such as banking, suggest that one of the critical enablers to achieving this new strategic position is organization structure and the corresponding business processes. First, carriers need to understand the full range of customer requirements (e.g. define segments, value propositions, product sets). Then they need to modify their internal processing architecture to reflect a market rather than a product orientation. This new customer-centric operating model will:

• Optimize overlap in service/product coverage
• Provide for effective management of pricing and cross-selling
• Integrate across all points of contact, both in sales and care
• Generate a holistic view of product management

In industries where bundles have succeeded, there are three key success factors. First, customers desire, perceive, and are willing to pay for the bundles. Second, the bundles are a combination of strong underlying positions and capabilities, not an attempt to hide a suboptimal offering within a broader package. Third, successful companies acknowledge (rather than deny or ignore) the inherent tensions between being customer centric and internally disciplined and efficient.
Our experience in a range of service industries suggests there are four organizational design principles that telecommunications service providers should keep in mind in building a customer centric organization:

- Differentiate the customer experience via new, open and transparent customer interfaces
- Redesign distribution and customer management around a solutions approach, that comprises product bundling
- Develop a segment-aligned delivery model that genuinely differentiates economics by market segment
- Pull away from competitors by getting execution right the first time (a bundle handicapped by poor delivery is worse than no bundle at all)

Putting these design principles to work might result in a fundamental transformation of most telecommunications carriers’ operating mode.

In conclusion, while product bundles appear to have the power to grow the share of wallet of residential households, their implementation is non trivial:

- Not all bundles are equal. In particular, pairing media and communications (beyond CLEC-like discounting of telephony) might not be an effective revenue booster
- Operating complexities might lead to customer service degradation, and potentially backfire on the attempt to grow revenues
- Given the increased costs of acquisition and delivery of bundles, their profitability needs to be carefully assessed

Finally, improved customer base management and launch of bundles require a substantial change in a telco’s operating model with a shift in the overall design toward understanding customer needs and building sustainable relationships.

IV. CONCLUSIONS:

In summary, we have outlined five clusters of managerial strategies:
<table>
<thead>
<tr>
<th>STRATEGY CATEGORY</th>
<th>SPECIFIC STRATEGY</th>
<th>DETAILS</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Consider Industry consolidation</td>
<td>• Achieve horizontal consolidation in wireless</td>
<td>• Regional consolidation</td>
</tr>
<tr>
<td></td>
<td>• Promote integration across wireless, local and long distance</td>
<td>• National mergers</td>
</tr>
<tr>
<td></td>
<td>• Promote development of intermediate markets for goods and services purchased by the telecommunications service providers</td>
<td>• Systems integration</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Outsourcing</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Network Operations</td>
</tr>
<tr>
<td>II. Increase service provider margins</td>
<td>• Reduce operating expenses and design the organization for cost flexibility</td>
<td>• Outsource functions that are not critical to competitive advantage</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Resize G&amp;A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Optimize the supply chain</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Reduce costs of retail distribution</td>
</tr>
<tr>
<td></td>
<td>• Redesign the organization structure to promote customer responsiveness</td>
<td>• Integrate all points of customer contact</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Redesign distribution and customer management around solutions delivery</td>
</tr>
<tr>
<td></td>
<td>• Postpone investments</td>
<td>• Postpone 3G roll-out</td>
</tr>
<tr>
<td>STRATEGY CATEGORY</td>
<td>SPECIFIC STRATEGY</td>
<td>DETAILS</td>
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<tr>
<td>-------------------</td>
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</tr>
</tbody>
</table>
| III. Pursue intra-industry collaboration | • Pursue industry-wide network sharing agreements in wireless | • Universal network sharing agreements  
• Wholesale/retail industry structure  
• Create a wireless industry sponsored technical organization | • Standard setting  
• Equipment certification  
• Testing and type approval  
• Create a wireless JV in charge of centralizing purchasing and refurbishing of handsets | • Negotiate bulk discount w/equipment manufacturers  
• Establish common set of specs for prepaid handsets  
• Build single reverse logistic process  
• Promote collaboration across wireline operators to develop industry-wide IT solutions | • OSS, Billing, Financial Management Systems Development |
| IV. Significantly enhance corporate governance organization and processes | • Change role of executive team  
• Implement Red teams to monitor investments in new businesses  
• Enhance role of corporate staff  
• Establish whistle-blowing system  
• Ensure BOD independence | | |
| V. Revenue growth strategies | • Improve management of customer base | | |
| • Emphasize product bundling and develop new integrated offerings  
| • Introduce commercial offerings of resilient, fault-tolerant network services |
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DeFontenay, Savin & Kiss. Submission to the New Zealand Commerce Commission Re: Section 64 Reviews into Unbundling the Local Loop Network and the Fixed Public Data Network, 2003


APPENDIX A:
Members of the Advisory Committee
Managerial Strategies Module
Advisory Committee

- Dave H. Benson, Executive Vice President, Strategy, Development and Planning – Verizon
- Mark L. Feidler, Chief Operating Officer – Cingular Wireless
- Prof. Kathryn Rudie Harrigan, Columbia University – School of Business
- Keith A. Kostuch, Senior Vice President, Strategy and Sourcing – Alltel Corporation
- Ken Meyers, Chief Financial Officer – US Cellular
- Judith D. O’Neill, Chair, Telecommunications Department – Greenberg Traurig
- John Grobstein, Vice President, Business Development – AT&T
- Todd Rethemeier, Telecommunications Analyst
- William Blessing, Senior Vice President, Business Development and Strategy – Sprint PCS
- Prof. Paul M. Vaaler, The Fletcher School of Law and Diplomacy – Tufts University
- Noemy Wachtel, Vice President, Finance – TANFEL Enterprises
- Steve Signoff, Vice President, Strategic Planning-Global Markets – Sprint Corp.
- Keith Cowan, Chief Planning and Development Officer – BellSouth Corp.
- Jeffrey Hedberg, Vice Chairman – T-Mobile USA
- Dan Reingold, Telecommunications Analyst
APPENDIX B:
Schedule of Workshops and Agendas
Managerial Strategies Module
Four Workshops

Workshop I: Is there a need to develop a new industry structure?
- Value of scale and scope
- Vertical/horizontal integration (value of the merger)
- Inter-player collaboration
- Value chain fragmentation (wholesale/retail)
- Is there a viable competitive strategy?
- Role of the regulatory framework

Workshop II: Can the industry achieve an adequate return on invested capital?
- The telecom industry compared to other industries (historical analysis)
- Drivers of operator performance (Why some players perform better than others?)
- Prescriptive analysis of ROIC improvement

Workshop III: Can the industry achieve profitable growth?
- Strategy models impacting the telecommunications industry
- Strategies for addressing the enterprise market needs
- Strategies for addressing consumer market needs

Workshop IV: Is there a need to develop a new operating paradigm?
- Targets of performance
- Achieving the benefits of scale and scope
- Organization structure: designing for flexibility
- Key business processes
- Corporate governance

January 24, 2003
March 14, 2003
April 25, 2003
June 17, 2003
APPENDIX C:
List of Concept Papers Submitted to Workshops
Workshop I: Is there a need to develop a new industry structure?

- Downturn of the US Telco industry - Prof. Eli Noam
- The investor’s perspective on the need to change industry structure - Dan Reingold
- Scale and Scope in the Telecommunications Industry - Raul Katz

Workshop II: Can the industry achieve an adequate return on capital?

- Managerial Strategies And the Future of ROIC in Telecommunications - Raul Katz, Carolina Junqueira
- ROIC Differences In The Telecommunications Industry - Todd Rethemeier
- Is Low Telecom ROIC Here to Stay, and How Long Will Investors Bear This? - Dominic Endicott

Workshop III: Can the industry achieve profitable growth?

- End-game Strategies for Telecommunications - Prof. Kathryn Harrigan
- Strategies for Addressing Enterprise Market Needs - John Grobstein
- Strategies for Addressing Consumer Market Needs - Raul Katz

Workshop IV: Is there a need to develop a new operating paradigm?

- A New Operating Paradigm for the Telecommunications Industry - Dominic Endicott
- Tailored Business Streams to Address Costs of Complexity - Eric Riddleberger

Joint Workshop with the Conference Board’s Committee of Large Telecommunications Users

- Finding a win/win solution in meeting large user needs – Steve Signoff
- Delphi Survey: Round II update – Ed Roche
APPENDIX D:
Minutes of Workshops
Introduction

The focus of this workshop was to discuss the need to migrate the telecommunications sector to a new industry structure as a means of reducing the competitive intensity, and, therefore, promoting the return to acceptable profitability levels. The issue was tackled from three different perspectives. First, the discussion focused on the regulatory aspect, exploring the role of government policy in promoting changes in the industry structure. Next, the discussion shifted to capturing the investor’s perspective on the need to change industry structure for ensuring adequate returns. Finally, the debate focused on whether the existence of macro-economies of scale and scope in the industry would warrant the need to consolidate.

The discussion of each perspective (government regulation, investor, and industrial organization economics) was kicked off by a presentation, after which the members of the Advisory Committee and the audience provided comments. Raul Katz, Leader of the module “Managerial Strategies”, moderated the session. Advisory Committee attendees included Mark Feidler (COO, Cingular), Dave Benson (EVP-Strategy, Development and Planning, Verizon), Keith Kostuch (SVP-Strategy and Sourcing, Alltel), Todd Rethemeier (MD, Bear Sterns), Prof. Paul Vaaler (Fletcher School of Law and Diplomacy), and Noemy Wachtel (VP-Finance, Tanfel Enterprises). The audience comprised approximately 25 invited individuals from industry, academia, and government.

Concept paper 1) Prof. Eli Noam – Downturn of the US Telco industry

Prof. Noam started by presenting a short paper entitled “Managerial Strategies for the Downturn” (included in attachment). In closing his presentation, he set the tone of the discussion, by raising the question of whether the US government should do something about migrating the industry to a “natural oligopoly”, or should we let the processes of natural competition drive, on their own, to a consolidation of US telecoms?

In addressing the question, a member of the Advisory Committee set the context by stating that the industry is witnessing the onset of destructive competition. As an example, the wireline industry is facing multiple competitors emerging from different sources. First and foremost, the CLECs have benefited from an advantageous regulatory structure. But in addition, competition has also developed from cable telephony, Internet telephony and messaging substitution (use of email instead of telephones). In this context, the question remains whether there is a need for the government to be proactive and limit the value destruction. Is it better to migrate to a natural oligopoly or have significant competition? Furthermore, what is the right level of competition? For example, on the wireless side, what is the right number of national players –six or four?
Given all these questions, one option would be for the government not to do anything. The problem with this option is that in the US each state has the ability to shape the regulatory framework. Therefore, even under the assumption that the federal government does not proactively intervene in defining the right level of competition, the states indirectly will, thereby rendering the regulatory process inefficient and possibly not leading to an optimal outcome. In light of this potential scenario, the federal government should need to become more proactive.

At this point, Prof. Noam asked the audience, regardless of the likelihood or not of government intervention, can anybody make money in this industry?

In response, it was mentioned by an Advisory Committee member that, in fact, some companies in the industry are indeed making money. For example, some wireless companies are profitable today. While six wireless players are certainly too many and there is destructive price competition today, with consolidation companies will improve their margins further. Even next year, absent consolidation, some wireless players will be cash flow positive. On the other hand, the key in wireline is that there needs to be facilities based competition, and the industry will definitely be profitable in the medium term.

Providing comments on Prof. Noam’s paper, a member of the Advisory Committee asked the question of why should telecom be different from any other industry? Though it started as a monopoly, why should the end outcome be different? The history of telecommunications has seen excess capital being available. This has led to euphoria, and hence excess supply of capacity. This resulted in poor returns. But once demand catches up with supply (of bandwidth), or excess capacity is retired, people should start making money. And supply seems to be restricted now, since capital markets are not allowing investments. So the process for recovery cannot be far behind.

In addition, the same member of the Advisory Committee asked Prof. Noam why was, according to his paper, the industry’s Herfindhal Index increasing? HHI is most sensitive to the market share of the largest player. Yet, in individual markets across the US, the dominant player’s share is coming down. This implies a decreasing HHI, at least for specific markets. According to this, the Advisory Committee member believed there is less concentration of revenue than it is implied by Prof. Noam’s data.

At this point in the discussion, the moderator asked the audience to go back to discuss the role of the government in managing the telecommunications industry structure.

A member of the Advisory Committee responded by stating that, independently of whether the government intervened or not, the less capable players will perish. For example, he ascertained that there are huge economies of scale in the landline business. Accordingly, players who have a natural platform to be successful –i.e. critical mass– will survive. In this context, the role of the government is to ensure that there are enough of such players. On the other hand, the government also has a role in
supporting consolidation. If consolidation helps the industry (which it will), then the
government should help.

Another Advisory Committee member reaffirmed the last point by mentioning that
industry consolidation needs to happen in order for the sector to return its cost of
capital. His question was, though, whether the government, by standing in the way of
consolidation, would prevent the telecommunications industry from returning the cost
of capital.

A workshop participant reminded the audience that the answer to the question of
government intervention (where? How much?) was not as straightforward as one might
expect. According to him, even if the government agrees with the policy to change the
industry structure by allowing consolidation to go through, the bankruptcy laws could
stand in the way of concentration. Initially, companies, which do not return the cost of
capital, will have to pass through the bankruptcy laws. However, this does not mean
that competition necessarily decreases. For example, long distance carriers are currently
facing increased margin pressure after WorldCom has “gone down” (?) since the
bankrupt company’s pricing has become more competitive. As a result, it is not only up
to the FCC and DOJ. The bankruptcy laws also could stand in the way of recovery.

Expanding on the need to introduce changes in the regulatory framework, another
member of the Advisory Committee stated that there are very few new industries that,
having built huge assets, have ever made money. Take for example the railroad
industry. It didn’t return any money until they got “Morganized”. They had a capital
bailout, and were forced to improve efficiency. This process was very painful.

In this context, it is important that antitrust laws also be reviewed. It is not economical
to have very large companies, with low growth rates. The government needs to look at
this in the context of supporting consolidation and growth.

Presenting a different perspective, a member of the audience stated that the industry
investment structure by itself is not the problem. To a large degree, the introduction of
wireless caused some of the current issues – landline substitution, too many players,
and strong price pressure. In this context, it is not only the large companies that are
suffering – many small companies made significant investments as well and are finding
it difficult to recoup their investments.

In support for the need of the government to intervene, another member of the
Advisory Committee stated that it is needed to define the industries/companies that are
not doing well and make the case to regulators for support. The issue is that, in order to
do so, it is tough to just aggregate lines of business and ascertain the need for
intervention. One cannot even compare Verizon with another company when trying to
make a case, given Verizon’s presence in such a large number of markets. The
boundaries remain all blurred and, as a consequence, one cannot use HHI clearly to
measure competitive intensity in the aggregate. In consequence, it is difficult to argue
that overall benefits derived from consolidation will reach all parts of a company and the industry as a whole in a uniform way. This would result in the need to conduct further research to ascertain the level of competitive and health of the sector in a much more disaggregated basis.

In support of the need for intervention, yet another member of the Advisory Committee stated that the industry needs competition in order to stimulate players to adopt new technology and continue to drive penetration. But, at the same time, the industry now also needs some consolidation to improve performance. However, the FCC and DOJ seem focused entirely on protecting consumers and ignoring companies. This is a historical stand, and needs to change. Number portability in the wireless industry (presumably a consumer benefit) is a great example – it is not needed, and would be disruptive and expensive to implement. It would result probably in more bankruptcies.

At this point of the discussion, in order to discuss a case where a government move could have an impact on industry structure, the moderator raised the following question: In a month, the FCC will be announcing the conclusions of its Triennial Review. It is important to see which way it will go. What do you believe will the short-term effect be?

To this question a member of the Advisory Committee considered that the CLECs could not even make a go at capturing share of the local market without unbundled pricing from the ILECs. CLECs have mostly retreated from markets where they do not have facilities. Consumers naturally favor larger players especially when end-prices are the same, since they see a service only as a product and not as a business. So they do not really care about who owns the pipe.

At this point of the discussion, Bob Atkinson from CITI raised the following issue: Shouldn’t the focus of the discussion be on managerial strategies (i.e. actions to be taken by the industry players)? If the government is not interested in solving the industries’ problem, can the industry do anything to work through the problem? Or, are the problems so intractable that they require government intervention?

A member of the Advisory Committee answered by saying that companies have to focus on facilities based competition while conducting prudent management of their business. Companies spend the majority of their energy developing strategies and taking steps to solve their business challenges independently, without relying on the government to address the regulatory issues. However, this module of the conference was specifically intended to discuss the role of government in shaping industry structure.

Addressing the issue from a different angle, Mr. Atkinson asked: Which managerial strategies are impacted by government action?
To this, a member of the Advisory Committee responded that the Government has a huge impact on the industry’s business. So there is no question, the industry players have to manage the regulatory agenda. As an example, if the local segment continues to be regulated with UNE-P and the CLECs continue to price below cost, then irrespective of what the industry does with the government, it will lose. The industry just ceases to be structurally capable of making money.

Having ascertained the need for government intervention, another Advisory Committee member urged the regulators to take a perspective that goes beyond managing the consumer interest. The wireless industry, while in a very intense price competition, has managed to stay profitable. It is not just excess capacity, but also that it still needs to invest – approximately $23Bn. There is a limit on how much one can push demand with lower pricing, and still stay profitable. America has a horrendously bad airline industry from a shareholder profitability point of view, although from a consumer perspective, it is great. Now, the government has to bail out the airlines with tax dollars.

In fact, the Advisory Committee member continued, in Washington the way to get elected is to provide near term value for consumers. As a result, you get into airline-like situations. The role of government ought to be to create equilibrium, where companies can generate decent returns. In the landline business there is too much capital invested in excess capacity. In wireless you need consolidation to bring some control over competitive pricing.

Going back to the question of government intervention vs. management action, a member of the Advisory Committee considered that the management teams are working hard at working the profitability equation. The reality is, however, that, like in wireless, few industries can return adequate returns with more than 7-8 players per market. The wireless industry has too many players. In a duopoly there is less problem and this is the case in most industries in the US. What types of regulation are going to work better in the case of a hyper competitive economy? In his view, consumer interest and industry health should not be viewed as opposite objectives. When an industry is in trouble, consumers pay for it indirectly – e.g., California energy crisis.

Another Advisory Committee supported this view stating that this is why consolidation is necessary. But it is crucial to look also at how the anti-trust laws are going to be interpreted and if there is going to be any change in their interpretation. Today, according to a strict interpretation of the law, only a couple of mergers of telecom companies would be approved.

At this point, Prof. Noam concluded that the telecom industry couldn’t adopt the airlines strategy. The airlines focused on driving prices down and this was possible in a service industry. However, in doing so, they lost account of the asset intensiveness of the business. This is not possible with telecoms. The airline industry’s strategy now is to get money from Washington.
* * * * *

**Concept Paper 2) Dan Reingold - The investor’s perspective on the need to change industry structure**

Mr. Reingold began by presenting his points of view. According to him, we are all investors concerned about timing of return, and money. We are looking for returns, which are greater than the cost of capital. Economists would want perfect competition, but investors want uneven competition, where there are discontinuities or opportunities to find undervalued assets. Else, it may be better to invest in the S&P index. The issue is that in a high fixed cost-low variable cost industry, the tendency to drop prices to drive demand and, hence, recover the fixed investment is high. If there are barriers to access capital, new players cannot get in and prices remain relatively stable. However, in the liquidity environment of the 90s, many small players were able to enter and create unsustainable competition.

The telecom industry did not fall apart until:

- The 1996 Telecom Act
  - Capital markets were influenced with hype and fraud. For example, expectations for Internet traffic, were extreme, and hence resulted in excess capacity built-up
- Capital markets focused on growth and not ROIC

In telecommunications, monopoly is not good, but neither is a high competitive environment. In Reingold’s view, the industry is in the midst of a major shakeout. The problem in wireless is not over-capacity, it just that there are too many players. In long distance, the problem is both overcapacity and too many players. In the local market there is neither overcapacity nor too many players.

In the case of long distance, consumers are no longer going to pay for distance – which is what they paid for in the past. The capital markets which drove investment in easy-to-provision services such as LD, have to be more careful now. The market is going through a massive recomposition. For example, WorldCom will emerge with no debt and the ability to price destructively. But that will accelerate the consolidation trend.

In the case of local, the Telecom Act was focused on creating facilities based competition, e.g., AT&T investing in cable telephony. The problem was that regulators did not factor in wireless substitution. In addition, DSL and cable took away the second line requirement that was used for dial-up. That has resulted in the access line loss we have today.

In wireless, the perfect industry structure is, of course, two players – one GSM-based (Cingular, T-Mobile and AT&T Wireless combined) and the other CDMA-based
(Verizon Wireless and Sprint PCS combined), and both vertically integrated with the ILECs and the IXCs. Perhaps Nextel as a third player. Even a four-wireless player scenario will be much better. But how can we get there?

RBOCs control of long distance is a natural consequence, even though it is a shrinking business. Possible combinations would be BellSouth-AT&T, Verizon-Sprint, SBC-WorldCom. That takes us back to 1984. Along these lines, if the wireline industry consolidates too much, the government might again split them, this time into retail and wholesale, to prevent undue market power.

As a result, Mr. Reingold does not see that a restructuring along the optimal scenario mentioned above is feasible. A more likely scenario is a middle ground, characterized by the following:

- 1-2 wireless mergers
  - Worldcom decides to sell in pieces to other carriers. For example, MCI goes to AT&T, WorldCom goes to an RBOC, while the international properties remain a question mark.
  - The only issue that remains uncertain is the future of the enterprise local market. Currently the RBOCs own the enterprise local market. But do they provide innovative good services? Not really, in Mr. Reingold’s view. Neither do they provide this in the enterprise long distance market, which is de-facto owned by AT&T and WorldCom, primarily. So more competition is required in this segment.

In response to Mr. Reingold’s scenario, a member of the Advisory Committee asked whether if the Bells get into enterprise local in a big way, is it good or bad?

His response was as long as they do not collude and fix prices, it is good.

* * * * *

**Concept Paper 3) Raul Katz - Scale and Scope in the Telecom Industry**

Mr. Katz began by presenting his paper (included in attachment).

At the conclusion of the presentation, a member of the Advisory Committee considered that it is important to separate economies of scale from efficiency and best practices. There is much that is achievable in the process of consolidation:

- Synergies and benefits
- Price rationalization
- Spectrum management and associated costs
Verizon and Cingular have not achieved, yet, all the scale economies since it takes time for this to accrue. Also, one needs to remember that the industry serves 600 mins today compared to 200 mins a little while ago. Hence costs are higher. Also investments are still ongoing. And, therefore, economies of scale are difficult to realize.

Another member of the Advisory Committee considered that significant scale is available in marketing, advertising and stores costs.

Another member of the Committee agreed. The historical scale curve shows a lot of scale as the industry has been adding minutes. Geographically overlapped mergers in wireless have not yet happened, and he believed that they would happen soon yielding further benefits.

There are many efficiencies in mergers:

- Spectrum utilization
- Sales and marketing
- Store rationalization
- Efficiencies in Trunking

A member of the Advisory Committee considered that best practices could be transferred – big benefits. This is more evident when a larger company buys a smaller one.

A member of the audience considered that there is scale – no question. The question is why is the industry not sharing facilities more? As an example, as a result of market entry, many switching facilities are redundant and remain hardly utilized. A case in point is New York City, where there are 28 Class 5 switches, of which only 2 are utilized in excess of 30%. The issue is that the wireless industry is not behaving rationally. Companies merge since they want to gain size. The urge to merge is sometimes driven by building sheer size and being capable of leveraging the balance sheet. Then they hold out, till the smallest and most irrational ones die away. They can then enjoy supernormal profits. But why do companies behave irrationally?

To the question of facilities sharing, a member of the Advisory Committee commented that network sharing is relatively common among new entrants in wireless. The issue emerged whether players would be willing to share facilities among more mature networks.

Another member of the audience considered that most regulated industries have typically been the hallmarks of inefficiency. Telecom is one of them. Compared to the
steel industry that has been amazingly innovative, the telecom industry has done nothing.

A member of the Advisory Committee did not agree with that viewpoint. He considered that the industry is working to improve efficiencies. Sometimes, management encounters difficult issues. For example, one cannot reduce people in a company without working with the unions, or dealing with all the practical and tactical/operational issues (e.g. Legacy systems and processes).
Introduction

The focus of this workshop was to discuss the options open for the telecommunications industry to achieve an adequate return on invested capital. The question was addressed from three perspectives. First, what has the historical trend in industry’s ROIC been and what are its driving factors? Second, what is the ROIC performance by industry sub sector (wireless, local, long distance, full service) and what are the explanatory variables for differentiated performance? Finally, given the obstacles the industry is being confronted with in terms of returning its cost of capital, what are some of the managerial strategies that could be implemented to improve the sector’s performance?

The discussion of each perspective was kicked off by a presentation of a concept paper (included in attachment), after which the members of the Advisory Committee provided comments. Raul Katz, Leader of the module “Managerial Strategies”, moderated the session. Advisory Committee attendees included Mark Fiedler (COO, Cingular), Keith Kostuch (SVP-Strategy and Sourcing, Alltel), Todd Rethemeier (Industry Analyst), Noemy Wachtel (VP-Finance, Tanfel Enterprises), John Petrillo (EVP – Corporate Strategy and Business Development, AT&T), Ken Meyers (CFO, US Cellular), Dan Reingold (MD, Credit Suisse First Boston), Caroline Galland-Ward (VP- Strategic Planning, Verizon), Steve Signoff (VP- Strategic Planning, Global Markets, Sprint). In addition, the workshop was attended by 10 invited individuals from industry and academia.

The workshop started with an open discussion regarding potential ways to build a consensus point of view from the multiplicity of perspectives of Advisory Committee members.

Options for building a consensus perspective regarding managerial strategies

The discussion started by each member of the Advisory Committee outlining what they believed are the issues that need to be dealt with in building a consensus perspective on managerial strategies:

- I understand there is a desire to come to a consensus. However, when talking about managerial strategies, one should refer to the specific markets they would be implemented in. Unfortunately, I am not certain how we define the markets (by product (wireless? wireline? IP?) or by market segment (consumer, enterprise)?). Secondly, given that we are in effect talking about different industries affected by different dynamics, it is troublesome to me as to how we can converge on a single set of managerial strategies

- In dealing with the problem outlined above, we could still generate a set of themes that would show a range of opinions. The combination of opinions
might be illuminating. Still, I would point out that we are missing the point of view of small telcos and cable cos which remain an element of the competitive landscape

- I would suggest that we keep the managerial implications at a disaggregated level, treating them by sector. So we will have to either look at the components or homogenize our thinking, which has dangerous implications

- Building on this, I would recommend working on each sector specific implications and then attempt to elevate to an industry wide perspective

- Along these lines, building consensus across such a variety of industry players might prove to be a valuable exercise. I would urge the group to push for consensus because we have some common industry factors that need to be addressed (e.g. the regulatory framework). In my view, policy troubles need consensus across players to be dealt with

- I would support that point of view. Even if we consider we are in different businesses, I hope we can draw some overarching themes. Furthermore, a managerial strategy that makes sense for one set of players might not make sense for another. And yet we can still learn from one another

- We are effectively facing a prisoner’s dilemma in the sense that if each company thinks of optimal strategies for itself, added together they could potentially destroy the industry. I would hope that we could rise beyond that dilemma and reach some consensus on a potential set of strategies that managers concerned with recovery would put in play. In fact, maybe in this environment we can think about what makes this industry work. Ultimately, problems developed because we have high fixed, low variable costs, coupled with low barriers to entry. In this context, we the kind of structural economics, it might not make sense to allow for full competitive entry. However, that was not what the regulator had in mind: it aimed for a fully competitive model. Building upon this, we had a financial marketplace that, believing that barriers to entry were low and dazzled by the potentially huge upside, funded everybody. Now, we are in a situation where we have too many players destroying the value of the sunk costs. Along these lines, lowest possible barriers to entry go against the industry health (and this point could be a platform for consensus). Beyond this, if each company pursues its own interest in the current regulatory environment, we will end up in destructive hyper-competition. Let us try to rise above it

- I would think that the complexity in reaching consensus is not only driven by the fact that we work within different companies. Interestingly enough, even beyond the different player perspectives, we have different points of view
based on the diversity of functions we represent: Finance, Strategic Planning, Operations

• I would urge us to arrive to some consensus. This industry has a horrible fundamental problem: it resembles the airlines, with implications for pricing. With high fixed/low variable costs, and strong demand, pricing remains the problem. Either we will end up with the “last man standing” or we will have regulatory-enforced cooperation. How do managers in highly cyclical and volatile industries do it? For example, does innovation continue to yield a competitive edge, or not? I would believe that it does not any longer

• Even if we do not reach a consensus on managerial strategies, I believe it would be useful to build an agreement on cause and effect of the current environment. For example, if we were to reach consensus that if the current regulatory framework continues to be the same, the industry would collapse, I believe that is progress. We could determine the point where we reach the regulatory fault line, beyond which we need to pull back and create a more controlled environment

• I have modest expectations about the possibility of reaching consensus. The industry is in big trouble. Excess financing made available to the industry, resulted in capacity exceeding current demand. Right now, from a managerial standpoint, we all need to show results based on what we have in place because no equity financing is being made available. I believe the “last man standing” syndrome will prevent us from discussing enlightened managerial strategies. Frankly, nobody is going to share particularly useful managerial strategies here because it is a game of musical chairs. Still, I would hope we could agree around a set of broad beliefs that if we all implement certain strategies, it would be counterproductive for the industry. Maybe those habits could be gleaned from the experience of other industries

The discussion focused at this point on the disaggregated structure of the industry, and what the expectations are regarding a future that does not result in a consolidation:

• If industry structure is a common problem, why is consolidation not happening? For example, wouldn’t everyone be better off if the wireless industry consolidated? Oligopolization is in everybody’s interest, but it still is not happening

• Wireless consolidation is inhibited because of the peculiar ownership structure. With the exception of Nextel, there is no clear ownership structure. So you have a “world-class game of chicken”. Why should I overpay to join now, when you will be gone in six months?
• The problem is that for a deal to go through you need to pass regulatory approval, you need funds and the will to incur the pain of a post-merger integration. Furthermore, even if you have an acquirer that has fulfilled the three conditions, you still need an acquired that is willing to throw in the towel. Some players who have interests in wireless and other sectors might not be willing to merge as of yet. It might seem irrational in terms of their wireless interests, but rational in terms of other interests.

• The sector is currently disaggregated. Many of us were forced to sell portions of our businesses, and disaggregate. We would not have done it on our own. Having said that, if the industry is disaggregated enough and the economics are right, the result might prove sustainable.

• Building on that, if each of us becomes good at something and then we build a web of alliances among the best of breed, the situation might improve.

• In fact, the paradigm of compete and cooperate might be an answer. This becomes even more relevant given the outside competitive challenge embodied by non-traditional players threatening the telcos market positioning. We have on one side IBM/Microsoft, on the other Cisco (with VOIP). What neither of these players has are our network assets, our customer knowledge and our ability to scale. Microsoft and IBM have failed several times trying to build scalable networking businesses. This has considerable impact on customers.

• To sum up, it is important that when we discuss managerial strategies we take a market-by-market view and therefore, recharacterize the sector. Once we take a market-by-market view, we should see how they interoperate. The caveat in doing so is that we should probably not attempt to optimize the telecommunications industry as a whole but that we do it on a sector by sector basis.

Concept Paper 1 – Short, medium and long term pressures on telecom ROIC

Mr. Katz presented the paper written by Dominic Endicott. At the end of the presentation, the Advisory Committee members made the following comments:

• I do not think we have a situation as negative as the one described in the paper. I believe that while it is true we are not returning our cost of capital, this is a temporary situation. When you get two capital-intensive competitors with strong asset bases up against each other, they will keep competing until pricing hits an asymptote. In order to get out of this, we need innovation: new forms of value/products, we need to reinvent the way we deal with customers, we need to create value we can grow from. The fact is that we are still too product centric, and we have limited understanding of customer
needs. For example, we should not deal with VOIP as a replacement technology, but we have to integrate it in the context of other applications.

- Building on this, we need to continue fostering innovation, but not the type that requires additional investment. I refer here to the innovation built around customer understanding.

- On innovation stimulation, I still think the regulatory framework has an impact. For example, the promotion of resale through UNE had the power to disincent innovation in the cable telephony/VOIP arena.

- On price competition, I am very skeptical that we are going to be able to stabilize pricing. In Long Distance, AT&T tried to play the Pepsi game with MCI and keep pricing steady. And yet, every now and then one of the two would break up and the other had to follow suit.

- In a business like this, pricing will fall. Let’s face it: long distance is a commodity without price elasticity in its favor. Wireless still has elasticity present. Management has to do all it can to keep wireless from becoming a true commodity. Perceived quality is very important. Convince consumers that there are differences and you can keep it from becoming a commodity.

**Concept Paper 2 – ROIC Differences in the telecommunications industry**

Mr. Rethemeier presented his paper. At the end of the presentation, the Advisory Committee members made the following comments:

- The higher performance of some of the players reflects factors other than industry position. For example, BellSouth’s higher ROIC reflects a geographic advantage. Another example is that Verizon’s lower ROIC could partly reflect its higher labor costs.

- Another issue is the ROIC calculation methodology. For example, some players strip out pension assets from the denominator.

- The paper clearly shows the advantages of first movers in wireless. If you enter the market first and capture profitable customers, at some point the pool of those customers empties up, so the new entrants have less of an opportunity.

- How appropriate is ROIC to measure performance? Clearly it measures the health of an industry but it has issues as well. For example, it assumes a stable technological environment. An industry that is in the midst of technological turmoil will necessarily score low aggregate ROIC due to capital investments.
That is true but even with technology transitions, you can play with your capital investment within a portfolio of businesses to moderate the impact of capex. This goes back to our prior discussion on differentiating managerial strategies across industry sub-sectors.

The problem is how much flexibility does the portfolio management approach allow you to have in terms of dealing with capex. I remind you of the dramatic impact capex cutting can have on service quality (example of Ameritech).

The value of ROIC might not be critical if you are analyzing stocks since it is not a metric that dictates where stocks are trading. However, since we are looking at the health of the industry, rather than making decisions for investors, it becomes a reasonable metric. In the long run, if companies are not generating value close to their cost of capital, innovation and growth will slow.

Another issue of ROIC is that it is a static measure, just as P/E multiples. As a result, emerging companies will always score low because they are on a build-up mode. On the other hand, it is a good metric to understand what is the yield on the money you put in. In the case of emerging companies, we might be better off with a dynamic model, such as DCF.

Concept Paper 3 – Managerial Strategies and the future of ROIC in Telecommunications

Mr. Katz presented his and Ms. Junqueira’s paper. At the end of the presentation, the members of the Advisory Committee made the following comments:

I believe that capex reduction with an impact on quality is a dangerous move since it might impact share.

I agree. If wireless quality goes down, so do minutes of use, and consequently revenue.

The other approach has to do with prudence when it comes to investing in new services, such as wireless data. We always believed we can follow quickly enough, and would rather let other people go through the minefield first.

In looking at the incremental return on capital, we would expect the industry to think more rationally about whether or not to go for that additional customer.
APPENDIX E:
Presentation to Final Conference