ANALYST(S)

David Heger, CFA

Companies mentioned in this report:

- **American Tower** (AMT - $169.44; Buy) - SFL
- **AT&T** (T - $30.70; Buy)
- **BCE** (BCE - $42.90; Buy)
- **Comcast** (CMCSA - $36.08; Buy) - SFL
- **Verizon Communications** 1,2,3 (VZ - $53.28; Buy) - SFL

Prices and opinion ratings as of market close on 1/29/19 and subject to change. Source: Reuters. SFL indicates companies on the Edward Jones Stock Focus List.

Edward Jones clients can access the full research report with full disclosures on any of the companies Edward Jones follows through the Account Access link on the Edward Jones Web site (www.edwardjones.com). Clients and others can also contact a local Edward Jones financial advisor, who can provide more information including a complete company opinion, or write to the Research Department, Edward Jones, 12555 Manchester Road; St. Louis, MO 63131.

Information about research distribution is available through the Investments & Services link on www.edwardjones.com.

---

Investment Overview

The telecom services subsector is experiencing the convergence of wireless, wireline, high-speed data and video services. Although the industry is maturing, we still anticipate growth opportunities in companies that are heavily exposed to wireless and high-speed data services. We are highlighting Buy-recommended names that we feel are positioned to grow at least as fast as the industry and yet have attractive valuations. The telecom services subsector is part of the communications services sector. We recommend that 9% of equity assets be invested in this sector in a well-diversified portfolio.

**Growth drivers still exist, but a maturing industry** - We feel that wireless services will continue to be a key driver of industry revenue growth as subscribers adopt smartphones and increase usage of wireless data. We expect wireline data services to also grow as consumers activate high-speed Internet connections and increase speeds to accommodate usage of Internet-based video and as businesses transition to new technologies. These growth drivers are partially offset by declining wireline voice and other legacy services.

**The Internet is changing everything** - Many traditional services are being upended by new solutions that are enabled by the Internet. Voice calls can be completed over the Internet using Skype or Vonage. Video is increasingly accessed via the Internet from sites such as Netflix, Hulu or Amazon Prime. Even pay-TV services are also available via the Internet on multiple devices, such as smartphones, tablet computers and PCs.

**Recommended names well-positioned to outperform** - In light of evolving communications technology, we are recommending names that we believe are well-positioned to benefit from the industry growth trends. We feel that Buy-rated AT&T, American Tower and Verizon will participate in the proliferation of wireless data services. We believe that Buy-rated Comcast will experience growth from high-speed data services and expand its share in emerging-business services.

**Valuations more attractive as short-term concerns have weighed on group** - Industry valuations are generally below historical averages. Stocks with wireless exposure have been constrained by competitive fears and the negative short-term impact caused by the adoption of handset installment plans. Dividend yields remain attractive and many companies have been growing dividends. We believe our Buy-recommended names have strong competitive positioning and are aligned with industry growth drivers. Rising interest rates could pose a risk to sector performance as the group tends to underperform the overall equity market when interest rates are rapidly increasing.
Industry is maturing, but growth opportunities still exist

The communications services sector has transitioned from a high growth phase in the late 1990s, with the deregulation of local telephone services and the adoption of wireless services, to a much more mature phase. Most consumers and businesses have a choice of purchasing landline voice, high-speed Internet and pay-TV services from at least two providers. Consumers can also opt for pay-TV service from two satellite TV operators and can purchase wireless services from multiple providers.

The way in which users access content and communicate with each other is also evolving. Years ago, most households had a landline telephone, while now an increasing number of people use a cell phone for all of their calls. A study by the Centers for Disease Control estimates that 53% of households in the U.S. do not have a landline phone (see Figure 1). The nature of traffic on wireless networks has also shifted as subscribers increasingly use cell phones for texting and accessing Internet content rather than for voice calls.

Figure 1 – Percentage of U.S. Households Subscribing Only to Wireless Phone Service

![Graph showing percentage of U.S. households subscribing only to wireless phone service from 2006 to 2017.](source: The Centers for Disease Control (CDC))

Viewing habits for video content are also changing as content is increasingly accessed via the Internet rather than from an over-the-air or pay-TV broadcast. Services such as Netflix, Amazon Prime and Hulu are continuing to grow the movie and TV content they offer "over the top" (i.e., via their websites on the Internet). These companies are also starting to invest in their own original programming, rather than just reaching agreements to purchase content from outside producers. To combat these trends, pay-TV operators have invested in software and programming agreements that allow subscribers to access the same pay-TV content that they enjoy at home on any device (PC, smartphone or tablet computer) via the Internet.

In light of current trends in the communications services sector, we estimate annual industry growth of 1% – 2% over the next three years. Although this growth rate is relatively modest, we anticipate that revenue from certain services will grow faster than the industry, while older legacy services, such as wired voice lines and long distance, will decline. We anticipate that revenue in three areas will grow faster than the industry as a whole:

- **Wireless Services**
- **Data Services & High-speed Internet Access**
- **Video Services**

**Wireless services continue to grow**

The wireless industry has become fairly mature in the U.S. as subscriber penetration levels now exceed 100% of the population. This situation is mathematically possible as some subscribers now connect multiple devices to wireless networks (smartphones, tablet computers, laptop PCs, etc.). We anticipate that penetration levels will continue to increase in the future as subscribers add devices to their wireless accounts.

Although the U.S. wireless industry has recently moved to mostly flat-rate pricing for unlimited data service, we still see potential for growth as customers add devices to the network and expand the application of wireless technology. We anticipate that wireless data revenue will continue growing for several reasons:

1) **Smartphone proliferation** – Wireless subscribers using smartphones have surpassed 80% of the total U.S. subscriber base. Once a consumer purchases a smartphone, his or her wireless data usage increases dramatically. Most users subscribe to a wireless data plan for the first time when they purchase a smartphone.

2) **Migration to 4G LTE networks** - Wireless carriers have recently upgraded their networks to 4G LTE technology, so many subscribers have purchased 4G phones. A 4G network allows a user to download information faster than a 3G network and enables more effective streaming of video content. We believe that video content has been the single largest driver of data traffic on 4G wireless networks. We estimate that wireless data traffic in the U.S. is growing over 30% year-over-year, and we believe these usage trends will continue. (see Figure 2).
3) **Emerging applications** – A number of applications that take advantage of wireless data capabilities are starting to emerge. Although the potential revenue per application is much lower than from a wireless phone subscriber, profit margins from these applications are typically higher due to lower marketing costs and no equipment subsidies being paid.

- **Machine-to-machine** - Any number of devices or machines can transmit data via a wireless connection to enable remote monitoring and control or the sharing of data across interconnected devices. Examples of machine-to-machine applications are asset tracking, remote monitoring of equipment or inventories, energy management, fleet management, self-service kiosks, digital signage, and health care monitoring.

- **Connected car** – Telematics systems, such as GM’s On-Star, represent the first generation of connected car technology, but the capabilities are expanding in the next generation to include monitoring of car mechanical systems, detection and alerting of potential mechanical problems, theft prevention and passenger Internet access.

- **Mobile payments** – Software applications, such as Google Wallet and Apple Pay, can be loaded onto a smartphone that enables credit card data to be stored on the phone. This software, combined with Near Field Communication (NFC) technology in the phone, enables a user to tap his or her phone on a point-of-sale terminal to pay for purchases.

We estimate that the combination of smartphone proliferation, adoption of 4G technology, and emerging applications will drive annual wireless industry growth of 4% - 5% over the next three years.

**In-home demand for data and Internet services continues to grow**

Just as wireless data services have been a key contributor to expanding wireless revenue, wired Internet and data services continue to drive revenue growth for wireline operators inside the home. For consumers, high-speed Internet connectivity is still expanding, as the market is not fully penetrated, and as consumers are increasing their dependency on high-speed Internet access. Based on data from Leichtman Research Group, 82% of U.S. households had some type of "broadband" connection to the Internet at their residence as of December 2017. This penetration continues to rise steadily, helping drive high-speed Internet revenue growth.

At the same time, consumers who already have high-speed Internet connections are demanding faster speeds for both access to traditional Web applications and increasingly to access "over the top" video content. As consumers are more dependent on an Internet connection for video content, the value of a high-speed connection is rising, and consumers are demonstrating some willingness to pay more for higher speeds. We estimate that across the industry, consumer high-speed Internet services revenue will grow 5% – 7% annually over the next three years.

In addition to growing consumer demand, business customers are seeking increasingly sophisticated data capabilities across a wireline network. Many businesses are willing to pay for data capabilities that are common on an internal corporate network to connect locations across telecom networks. Business customers are also demonstrating strong interest in managed/hosted services in which a telephone company hosts software applications on servers in a data center on behalf of business customers. As a result, the customer pays a monthly fee for the service, but does not have the capital investment or operating expenses associated with running its own data center. We estimate that the total market for all forms of business data services will grow 6% – 8% annually in the next three years as higher-growth services offset declines in legacy services.

**Challenged by Internet content, the video services market has slowed**

The entire pay-TV industry is in a state of flux as customers can increasingly access video content from multiple sources over the Internet. Media companies are trying to adapt their business models to the new ways that consumers can view content. The pay-TV model is based on cable TV and satellite distributors paying content providers a monthly fee.
for every customer that subscribes to a particular package of cable TV channels.

With the "over the top" model, payment plans vary. For example, Amazon Instant Video allows users to only pay for content on an a la carte basis. In contrast, Netflix users pay a flat monthly fee to access all content. As content increasingly becomes available via the Internet, traditional cable TV networks are making content available to any device over an Internet connection.

With the availability of "over the top" video and a trend towards cord cutting, subscriptions to traditional pay-TV service have dropped to about 76% of households from about 84% of households five years ago. Despite declining subscriber levels, revenues across the industry are stable to growing modestly due to price increases and additions of new features, such as multiroom digital video recorders, high-definition (HD) service, and video on demand. Some pay-TV providers are also offering more limited channel offerings at a lower price as an online option to retain customers and attract customers who have not previously subscribed to pay-TV. AT&T's DirecTV Now and Dish's Sling TV are examples of such services.

Declines in legacy telecom services weighing on industry growth

Landline telephone service has been on a steady decline for several years due to multiple factors (see Figure 3). The biggest impact has been from the substitution of wireless service for landlines. Also, consumers are opting for other alternatives, such as phone services offered by cable-TV companies or services offered by Vonage, Skype, MagicJack and other competitors. Although the market for business customers is not experiencing as much impact from wireless substitution, numerous competitive alternatives are available. We estimate that the market for local wireline voice services will decline 5% annually in the next three years.

Figure 3 – Total U.S. Local Telephone Revenue ($ billion)

Source: FCC

Competition is fierce in the telecom world

To be able to grow, all communications-services players need to invest in emerging technology to offer next-generation services and aggressively attack new markets. Cable-TV companies are increasing their market shares in consumer high-speed Internet and in services for business customers. Telephone companies are grabbing share in the pay-TV business, and most have exposure to wireless services that the cable-TV companies do not have. Due to fierce competition, industry players must be exposed to higher-growth areas to deliver increasing revenue and earnings.

How to Invest in the Sector

We recommend that in a diversified equity portfolio, 7% of equity assets be invested in the communications services sector. The media & entertainment subsector is the largest component of this sector, so we recommend starting here. The stocks within this subsector can be sensitive to economic cycles and may have some volatility in their share prices.

To somewhat offset this cyclical, investors may diversify their holdings with stocks from the telecom services subsector. Companies in this subsector have historically been less sensitive to the health of the economy due to their relatively stable earnings. Because stocks in the telecom services subsector typically pay high dividend yields, they tend to be sensitive to interest rates and may underperform the overall equity market in a rising interest rate environment.

For portfolios that are underweighted in the telecom services subsector, our current Buy-recommended names are AT&T, BCE, Comcast and Verizon. We feel positive about these names because they are exposed to one or more of the industry growth
drivers and trade at valuation levels that we feel are attractive. AT&T, BCE, and Verizon are exposed to both wireless data and high-speed Internet services and are penetrating the video services market. Comcast is exposed to high-speed Internet services, is successfully penetrating the business data services market, and is benefiting from proprietary content via its NBC Universal ownership. American Tower is a real estate investment trust (REIT) within the financial sector, but the company benefits from overall growth in wireless data traffic that drives the need to expand equipment capacity at wireless tower sites. Please see the full opinions of the individual companies mentioned in this report for additional information, including valuation and risks.

Valuation
We feel that valuations of large-cap communications services companies are attractive, thus we see opportunities in companies that offer potential long-term growth that is above the sector average. When valuing communications stocks, we use a combination of valuation methodologies, including price-to-earnings (P/E) ratios on an absolute and relative basis as well as discounted cash flow (DCF) analysis.

Risks
We feel that investors face several risks investing in the communications services sector. The sector is highly competitive and is very capital intensive, requiring significant investment to add network capacity and deploy emerging technology. Stocks in the sector tend to be sensitive to interest rates; hence the sector tends to underperform the overall equity market in a rising interest rate environment. Traditional wireline phone service is declining and will likely continue to decline due to wireless replacement and Internet-based alternatives. Methods for accessing video content are changing, which is challenging the established model for providing pay-TV services.

Required Research Disclosures

Analyst Certification
I certify that the views expressed in this research report accurately reflect my personal views about the subject securities and issuers; and no part of my compensation was, is, or will be directly or indirectly related to the specific recommendations or views contained in the research report.

David Heger, CFA
Analysts receive compensation that is derived from revenues of the firm as a whole which include, but are not limited to, investment banking revenue.

1. Edward Jones publishes research reports on both this issuer's bonds and common stock. These reports are authored by different research analysts. Further, Edward Jones utilizes different analysis techniques in analyzing bonds and common stock investments. While bond and common stock research reports about the same issuer may appear inconsistent or contradictory, the separate reports should be reviewed independent from one another.
2. Edward Jones has received compensation from this company for investment banking services within the last twelve months.
3. Edward Jones has provided investment banking services for this company within the past twelve months.

Buy (B) - We believe the valuation is attractive and total return potential is above average over the next 3-5 years compared with industry peers. Hold (H) - We believe the stock is fairly valued and total return potential is about average over the next 3-5 years compared with industry peers or a special situation exists, such as a merger, that warrants no action. Sell (S) - We believe the stock is overvalued and total return potential is below average over the next 3-5 years compared with industry peers. In some cases we expect fundamentals to deteriorate considerably and/or a recovery is highly uncertain. FYI - For informational purposes only; factual, no opinion.

The table below lists the percent of stocks we follow globally in each of our rating categories. Investment banking services indicate the percentage of those companies that have been investment banking clients within the past 12 months. As of: 30 January 2019

<table>
<thead>
<tr>
<th>Stocks</th>
<th>BUY</th>
<th>HOLD</th>
<th>SELL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investment Banking Services</td>
<td>48%</td>
<td>50%</td>
<td>3%</td>
</tr>
</tbody>
</table>

Other Disclosures
This report does not take into account your particular investment profile and is not intended as an express recommendation to purchase, hold or sell particular securities, financial instruments or strategies. You should contact your Edward Jones Financial Advisor before acting upon any Edward Jones Research Rating referenced.

All investment decisions need to take into consideration individuals’ unique circumstances such as risk tolerance, taxes, asset allocation and diversification.

It is the policy of Edward Jones that analysts or their associates are not permitted to have an ownership position in the companies they follow directly or through derivatives.

This opinion is based on information believed reliable but not guaranteed. The foregoing is for INFORMATION ONLY. Additional information is available on request. Past performance is no guarantee of future results.

In general, Edward Jones analysts do not view the material operations of the issuer.

Diversification does not guarantee a profit or protect against loss in declining markets.

Special risks are inherent to international investing including those related to currency fluctuations, foreign political and economic events.

Dividends can be increased, decreased or eliminated at any time without notice.

An index is not managed and is unavailable for direct investment.

U.S. only: Edward Jones - Member SIPC
3 Year Rating and Price History for: VERIZON COMMUNICATIONS as of 01-29-2019

Created by BlueMatrix
Data used to create price chart is provided by Reuters