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Monthly Update



An investment publication with a focus on Telecommunications, Technology, Industrial and Small Cap stocks.

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Welcome!

Since our newsletter issued last month, the equity markets have loosened the reins on volatility a bit, but prices have continued to deteriorate modestly. In our view, equity market dynamics have changed quite a bit over the previous months, with a market dispensing greater dichotomy between winners and losers than seen in the more general uptrend of the previous several years. As such, growth stocks with international flavor appear to remain poised for continued price improvement in the coming quarters in our opinion.

Although we've stated this for several months, questions do in fact remain over extent of the credit issues and as such, financial holdings remain outside of our target allocation parameters. Residential housing, which seems destined for continued deterioration still must cope with additional mortgage resets and appears to be performing below already dampened expectations. Fed rate cuts have been and will continue to be a major concern going forward, but are necessary to help out the consumer with the psychology of lower home values. As we have stated before, international growth appears to remain robust despite the domestic weakness and falling dollar, with globally diversified companies continuing to benefit. Included in this month's analysis are notes from recent earnings announcements and management conference calls.

Cisco (CSCO) - Cisco's Enterprise Market Deteriorating, but Service Provider Market Remains Strong

The global service provider business remained very strong with order growth in the high teens. Video continues to drive service provider network demand and is potentially the killer application for loading and bringing value to the network. Consumer video and broadband build outs are driving much of the service provider investment. The adoption of Unified Communications, Telepresence, and other video applications is having a profound impact on high end routers.

Within the US, Cisco sees continued strong service provider and commercial markets, while the enterprise market (financial, automotive, and to a lesser extent retail) is softening. Weakness is particularly coming from Cisco's top 25 customer companies (eight of them are financial and two are automotive). Fortunately, Cisco believes US Enterprise weakness won't trickle into carrier equipment spending. Carriers are in a race to expand their broadband service offerings, including the support of video.

Ericsson (ERIC) – Wireless Infrastructure Market Increasingly Dependent Upon Emerging Markets

Ericsson posted a difficult September quarter due to a revenue mix shift, which resulted in lower software content for its wireless equipment, and in-turn caused a significant deterioration in gross margins. In mid-November at its Management Briefing, Ericsson again disappointed investors, revising its December quarter revenue outlook from SEK 53 – 60 billion (\$8.2 - \$9.3 billion) to the lower end of that range. Ericsson continues to see problems in the networks business with weaker European and U.S. markets. Ericsson also cited slowing demand in certain emerging markets and the weakening U.S. dollar. Ericsson doesn't expect

market conditions to improve in 2008. The disappointing gross margin performance from the wireless equipment industry's largest player (approximately 40% market share) is concerning as Ericsson should benefit from scale advantages.

Motorola (MOT) – Introduces New CEO

Current Chief Operating Officer Greg Brown will succeed Ed Zander as CEO effective January 1st, 2008. Ed Zander will continue to serve as Chairman of the Board until the annual stockholder's meeting in May 2008. Prior to his role as President and COO, Mr. Brown headed four different businesses at Motorola. Prior to joining Motorola, Mr. Brown was chairman and CEO of **Micromuse**, a network management software company and received his bachelor's degree in economics from Rutgers University. The industry speculates Motorola will now look to sell off one of its businesses, with the wireless equipment business as a likely candidate in the increasingly difficult market.

Verizon Wireless Selects It's Next Generation Wireless Network Technology

Verizon and Vodafone jointly announced a coordinated trial plan for LTE (Long Term Evolution) that begins in 2008. While Verizon Wireless operates a network based on CDMA technology, LTE is a next generation technology for GSM networks (approximately 86% of the world's subscribers are on GSM technology networks, including AT&T and T-Mobile. The remaining subscribers are on CDMA networks including Verizon Wireless and Sprint). The fundamental technology for LTE is quite similar to the next generation technology for CDMA networks, making this technology choice possible. Trial suppliers include **Alcatel-Lucent, Ericsson, Motorola, Nokia-Siemens**, and **Nortel** (current CDMA suppliers are Alcatel-Lucent, Nortel, and Motorola). Verizon did not disclose when it plans to begin the commercial upgrade to LTE for its network, although capital spending implications probably won't begin until 2010. From 2008 – 2010, Verizon Wireless spending on the 3rd generation of CDMA equipment (called EV-DO) will largely continue to be driven by increased data traffic and 3G subscriber growth. In 2010, however, expect CDMA EV-DO spending to stagnate as Verizon upgrades its base stations to support LTE and transition wireless video / data traffic onto the new 4G LTE network. CDMA voice spending will probably continue for many years after that and Verizon probably won't shut down its CDMA network for an extended period of time, resulting in a maintenance spending environment for Alcatel-Lucent, Motorola, and Nortel CDMA gear.

Verizon Wireless shifting from CDMA to LTE also allows Verizon Wireless customers to roam onto Vodafone's network when traveling to Europe. Verizon also intends to closely coordinate features from its FiOS FTTP (Fiber to the Premise) television service it's now rolling out with this new wireless LTE network. LTE technology targets 100 Mbps (megabits per second) download speeds and 50 Mbps upload speeds. However, those rates are achievable in test environments, whereas in a real world environment, the subscriber will experience far slower speeds. By comparison, the Verizon Wireless 3G CDMA EV-DO network achieves test download speeds of 3.1 Mbps and upload speeds of 1.8 Mbps whereas the subscriber experiences download speeds of approximately 700 kbps (kilobits per second). Additionally, today's higher speed DSL services are typically advertised at around 3.0 Mbps for the download, with the subscriber realizing roughly half that speed.

Verizon Wireless Will "Open" Up its Cellular Network

In a partial response to **Google** and **Sprint Nextel's** WiMax initiative, beginning in mid-2008 Verizon Wireless will "open" its network, allowing wireless customers on its network to use a wide array of phones and mobile devices bought elsewhere (previously a subscriber selected Verizon Wireless, then chose a mobile phone. Now, a subscriber can choose a compatible phone from anywhere and take it to Verizon Wireless). The ramifications go beyond cell phones. Verizon hopes market innovation will take hold and that electronics manufacturers will create a variety of devices for connectivity to its open network, such as notebook computers with wireless broadband, personal music devices, digital cameras, electronic book readers, portable gaming systems, and even kitchen appliances. Technical standards for connectivity to the Verizon Wireless network will be released early in 2008.

AT&T Lowers TV Service Target, but Cites Higher Spending on the Project

In a recent 10Q filing, AT&T updated its U-verse spending (Project Lightspeed). AT&T now expects spending to be between \$4.5 and \$5.0 million on U-verse from January 2007 through the end of 2008. AT&T will be shifting some of that capital to start-up costs to expand into the initial markets in the Southeast region. AT&T now expects to pass approximately 17 million homes by the end of 2008. In May 2007, AT&T lowered its homes passed target from 19 million to 18 million due to delays in receiving equipment from vendors and difficulties securing video franchises. AT&T is essentially shifting from a FTTC (Fiber to the Curb) architecture for the BellSouth region to a FTTN (Fiber to the Node) architecture, a negative for **Tellabs** since Tellabs was a supplier into BellSouth's FTTC network, but Alcatel-Lucent is AT&T's FTTN supplier. Additional clarity is anticipated when AT&T hosts its Analyst Conference on December 11th.

Emerging Telecom Equipment Theme – Wireless Equipment Transition to Support Wireless Data Applications

During September quarter earnings calls, Telecom equipment vendors repeatedly highlighted a shift in wireless core networks from traditional voice-centric circuit switching technologies to packet technologies (IP or Internet Protocol). Packet technologies are better suited to handle data traffic, which has been increasing. For Verizon, wireless data traffic now represents 20% of total service revenue and 60% of service growth. More than 35% of retail data revenues come from business applications driven by laptop air cards and e-mail (the remainder largely driven by text messaging). This transition has been anticipated for some time and finally appears to be getting underway. Comments from equipment providers during September quarter earnings:

- **Alcatel-Lucent** highlighted during its earnings call that R&D will increasingly focus on the IP transformation that is beginning in wireless networks. IP and Optical technologies are already being used in mobile networks for IP based aggregation and backhaul (connects the base station at the cellular tower site to the base station controller. One base station controller manages approximately 100 base stations).
- **Ericsson** noted a shift occurring in the wireless network core from traditional circuit switching to a packet core (softswitching and other packet-based equipment). As in every technology shift, instead of just adding to an installed base of circuit switches, the transition to a packet core is a new network roll out, with the possibility of greater competition fighting for the new footprint. China is rapidly moving towards Mobile Softswitching, where half of the shift towards softswitching has already occurred. The aggregate sales number for the same capacity in softswitch is a lower number than for circuit switch because it's a more cost-efficient product. Upgrading to softswitch also carries with it expected investments in IMS and other related products. There will continue to be legacy business with circuit switch for quite a while, because lots of switches will be out there and will continue to be serviced, and at times even upgraded.
- **Nortel** noted AT&T will be among the first to deploy selected elements of a new all-IP product line from Nortel for their GSM and UMTS network (3rd generation technology for GSM networks). The Nortel solutions are designed to help service providers easily evolve to an all-IP network. Nortel's VoIP (Voice over IP) and IMS (IP Multimedia Sub-system) products are gaining traction and should improve in 2008.
- **Ceragon Networks** experienced an increase in revenue for IP-based solutions resulting from the beginning cellular migration to IP.
- **Tellabs** continues to recognize disappointing sales for their 5500 cross connect, their bread-winning product for the past 20 years. Over the past few years, the 5500 has utilized traditional circuit technology to backhaul wireless voice traffic. In the AT&T network (Cingular), AT&T runs wireless voice traffic over the 5500 cross connect and wireless data traffic over the 8800 multiservice router. While 5500 revenue disappointed, revenue for Tellabs Data Networking products (of which the 8800 is a part of) increased from \$35 million in the June quarter to \$57 million in the September quarter.
- Tier two equipment companies likely to benefit from the wireless core and/or backhaul

shift to IP include Adtran (ADTN) for wireless backhaul, Ceragon Networks (CRNT) for wireless backhaul, Ciena (CIEN) optical equipment for wireless backhaul, Sonus (SONS) for wireless core network, and Tekelec (TKLC) for wireless core network.



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Biography

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Ted Moreau was previously Robert W. Baird's Senior Analyst covering Network Technology (1985-2005). Ted has been nationally recognized by the Wall Street Journal and Institutional Investor Magazine. Ted was named to the Wall Street Journal "All-Star Analysts Team" in 1994, 1996, and 1997. He was honored by Institutional Investor Magazine as a "Home Run Hitter" in 1994. Ted was also named to the Institutional Investor's regional "All-American Team" in 1997. He received a BBA and an MBA from the University of Wisconsin-Madison.

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Ted Moreau joined The Cardinal Group in 2007 and has over seven years experience in the telecom and securities industries. He started his career at Artesyn Technologies, later acquired by Emerson, as a telecom equipment market analyst. Ted has a degree in Finance from the University of Wisconsin-Madison.

Disclosure

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