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Cable Providers

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Disclaimer: Please see the disclaimer at the back of this report for important information.

Rating: HOLD

Investment Conclusion

Industry Recommendation

Cable companies (MSOs) have been making significant inroads into American households. With their digital service offerings, they are adding almost twice as many new subscribers as their Digital Broadcast Satellite rivals. Because MSOs and DBSs do not engage in price wars but rather in customer offerings, cable companies are not as prone to economic downturns in terms of basic service revenue. With MSOs offering more attractive packages (e.g. lower cost per channel, more channels, and added features, etc.) than DBSs can, MSOs will capture the larger slice of the pie in the race for market share.

The distance between MSOs and DBSs in their rat race might gap even further with the accelerated rollout of Video-On-Demand (VOD). To the customers, VOD would clearly differentiate the MSOs over DBSs' Personal Video Recorder (PVR) option. Also, VOD means more new customers to be added, additional revenue streams from existing customers, and greater retention rates. With most MSOs like Charter, Comcast, Cox, and AOL aggressively deploying this initiative already, reaping the benefits may be closer at hand than it looks. By 2002, 30% of digital cable homes are expected to have VOD.

With a tightening in consumer spending due to economic weakness and the September 11 attacks, consumers may be more hesitant in the short term to spend on premium cable services. With increased marketing efforts, cable companies will slowly get more and more customers to subscribe to their increased services. Bundling of these services will also aid in increasing the revenue per subscriber household. Due to the short-term uncertainty in the economy we are issuing a **HOLD** rating on the company. We believe that the cable company offers a stable cash stream and can act as a safe haven in an uncertain economy. Once the economy has bottomed and consumer confidence is restored we expect the cable industry to resume growth. Once this happens we expect cable to outperform the market.

Company Recommendations

AOL: **Hold** – AOL has first-mover advantage because it is leading the pack with VOD deployment. Being the largest in size (i.e. 18 million home pass-throughs) and a competitive one in household penetration (i.e. 62% in basic penetration and 16% in digital penetration), it garners the critical mass that helps it achieve cost synergies as well as blow away any near-threat competition like Comcast. AOL also has an advantage by integrating the ISP and cable provider, allowing it to capture all future revenues of the cable subscriber. As cable moves to a more interactive platform, AOL has the infrastructure in place to strategically squeeze more revenues out of the consumer. Trading at a ratio of 20 EV/2002E EBITDA we believe the company is fairly valued. Due to its extensive service offerings we believe that it can trade at a higher premium relative to the group.

ADLAC: **Buy** – Adelphia shares have been punished for its highly leveraged balance sheet. This came from continuous funding for its CLEC subsidiary ABIZ. The sell-off might have been overdone since the $800 million funding commitment from the Rigas family should be enough to cover their costs. The positives are that it is on track with their guidance for 1.8 million subscriptions and EBITDA growth of 11%-12.5%. Although it is now trading at 11.2 times 2002E EBITDA versus the group's 14 times, we believe the company can trade up to a ratio of 12.5 EV/EBITDA, which would give it a 50% increase in price.

CVC: **Hold** – With 3 million subscribers clustered in the New York area, Cablevision is approaching the critical mass that can accelerate its EBITDA growth and propel it to become a top tier MSO. The stock has been sold off because of an agreement with AT&T to unload $1 billion in CVC stock out of the expected $2 billion equity offering. Trading at 14.4 times 2002E EBITDA versus the group's 14 times, we believe it is fairly valued and believe the company is a hold.

CMCSK: **Hold** – Comcast reported the net addition of 243,000 digital cable subscriptions, up 21% from second quarter, and 117,000 cable modem additions, up 15% sequentially. While these numbers look healthy, it has lowered its advertisement revenues estimates, which could impact its growth prospects. Since Comcast is trading at the group's industry average multiple of EV/2002E EBITDA, we issue a hold rating on this company.

CHTR: **Buy**– The recent departure of CEO Jerry Kent has put downward pressure on the stock. We see no further negative impact on the company in the near term, such as further senior management departures or shuffling, so due to the depressed price we are recommending a BUY. Charter is a premier name. Trading at 9.8 times 2002 EBITDA, the stock is at a discount. In addition, last month management reported bullish evidence of new product acceleration which tells us that the company is on track to exceed expectations.

Cox: **Sell –** Cox trades at a relatively higher EV/2002EBITDA ratio of 17 compared to the industry average of 14. Cox has started to roll out VOD to its customers but has not been as aggressive as some of the other MSOs. Since the company's growth prospects really depend on increased revenues from subscribers, the company must focus more aggressively on its VOD initiatives. The company has thus far taken a wait and see approach with the studios and their contract agreements, and this could result in Cox lagging their DBS competitors.

RCN: **Sell**- RCN has invested heavily in an advanced network, and must make that investment profitable. It has low digital penetration at present, but has partnered with Charter Communications, which has been a more successful company. Since the company is still in its early growth stages, we do not expect them to be EBITDA positive for at least two more years.

The market is not placing much value on its growth prospects and we do not expect it to until the company can materialize expenditures into revenues.

Rogers: **Buy**- Rogers has a significant first-mover advantage in its Canadian market. It also has a favorable Price/2002E EBITDA ratio. The company also has a media segment to its business which could provide content for VOD and digital cable in the future. The company has been aggressive in rolling out digital cable in Canada and we believe it will be successful in rolling out VOD in Canada also.

United Globalcom: **Buy**- United GlobalCom has made a significant bet on penetrating foreign markets, and we believe this is where there may be the largest growth opportunities. The company has made significant bets on the European markets, purchasing assets from Liberty Media Group. The stock has been extremely beaten down since it is not yet EBITDA positive. We see larger growth potential with this cable company compared to RCNC in Canada. Once the market realizes the company has some promise for significant increases in EBITDA, we believe the stock could appreciate significantly.

Table 1. Nine Month Target Prices for Cable Providers

Firm	Rating	Target % increase	Comments
AOL	**Hold**	**$36** **7%**	First mover advantage with VOD and aggressively pursuing VOD. Integration of the largest ISP and cable company allows for greater revenue capture. Already has made strides in its own content generation.
ADLAC	**Buy**	**$36** **49%**	Highly leveraged balance sheet has placed unwarranted pressure on the stock price. Exposure to poorly performing CLEC subsidiary is overly built into the current stock price. Relatively cheap valuation trading at 11.2 times Enterprise Value/2002E EBiTDA.
CVC	**Hold**	**$40** **9%**	Trading slightly above industry average of 14x 2002 EBITDA. AT&T unloading $1B worth of the company stock Not as aggressive on its VOD rollout.
CMCSK	**Hold**	**$40** **8%**	Been lowering advertising revenue estimates. Trading at the industry average of 14x 2002 EBITDA. One of the cable three largest cable operators.
CHTR	**Buy**	**$20** **41%**	Premier name that has been depressed due to CEO departure. Cheap valuation trading at 9.8x 2002 EBITDA. Bullish evidence of new product acceleration.
COX	**Sell**	**$36** **-9%**	Expensive valuation trading at 17x 2002 EBITDA. Not as aggressive in its VOD rollout.
RCNC	**Sell**	**$2.70** **-11%**	Low digital penetration so little opportunity for even VOD growth. Not expected to be EBITDA positive until at least 2 years out.
RG	**Buy**	**$20** **48%**	First mover advantage in Canadian market. Favorable price/EBITDA ratio. Media segment to business to provide content for VOD
UCOMA	**Buy**	**$2** **182%**	Good bets on foreign markets, especially Europe. Smart acquisitions especially in recently acquired Liberty Media assets. Company is not yet EBITDA positive, but should be by the end of 2002.

Key Metrics

The principal metric used in the cable TV industry is EBITDA. Earnings are principally produced by sales of services to households. The number of households that are passed by a company's network is therefore a key metric. (See Table 1.) The penetration of those households is the counterpart to that metric. Penetration growth is used as a proxy for the company's marketing effectiveness. Fixed costs are incurred in upgrading a network to provide Internet and telephony services, in order to offer a "bundle" of services to customers. This bundle typically consists of three items: tiers of digital entertainment options, long-distance and local telephone service, and Internet access. The fixed costs incurred in establishing the network (homes passed), and the marketing costs incurred in acquiring new customers (penetration) for these services have significantly lowered most Cable TV providers' earnings in 2001. However, industry analysts expect these bets to pay off and are generally positive regarding future earnings estimates for the industry.

Table 2. Size and Penetration of Cable Networks

Firm	Homes Passed by Network	Basic Penetration	Digital Penetration
Adelphia	9,625,928	61%	18%
AOL	18,253,000	62%	17%
Cablevision	4,362,665	69%	1%
Charter	11,281,142	62%	20%
Comcast	14,124,304	60%	15%
Cox	9,954,202	63%	14%
Rogers	2,974,500	77%	10%
RCN	1,755,907	23%	7%

History

The advent of cable television simultaneously took place in both Pennsylvania and Oregon in the late 1940s. At the time, the fledgling television industry provided broadcast signals only to the most populous and economically advantageous areas. For those regions that had poor TV reception either because of obstructions or long distances from signal transmitters, cable television provided a workable solution. Essentially, the early cable providers constructed large antennas on hilltops or buildings for improved TV reception, and then strung coaxial cable from the antenna to the local community. Out of this environment the acronym CATV, representing Community Antenna Television was born.[1]

With the advent of satellite broadcasts to cable systems in the 1970s, cable operators were able to provide more channels than were available over the traditional airwaves. Because of these value-added capabilities, cable television made significant inroads into markets where TV reception was already reasonably acceptable. Additional services such as specialty channels and pay-per-view have brought the cable industry to where it is today: approximately 63% of

[1] Connors, Jim. "The Evolution of Cable Television" Javaworld, Oct. 1996.

American households have cable TV, and 92.8 million homes are passed by cable[2]. Those same homes should be passed with two-way plant cable, which allows broadband signals to run both to and from the home, by the end of 2002.[3]

Digital Cable

The recent driver in growth in the cable industry has been its transformation from analog based to a digital based technology. From 1994 to 1996, the Multiple Service Operators (MSOs) did not have a digital television strategy to rival Digital Broadcast Satellite (DBS) competition. The cable industry finally launched its digital services initiative in 1998, but trailed DBS subscriber additions for two years. Although new DBS households should exceed new basic cable additions for the next three years, the cable industry appears to be winning two thirds of the households choosing to upgrade to digital television.[4]

MSOs (cable companies) and DBS providers have competed fiercely over the past several years for new subscribers. Cable companies had long had little competition in their industry and underestimated DBS providers' abilities to capture market share and actually cannibalize their own markets. Over the past couple of years, cable companies have concentrated on spending to upgrade their systems while concentrating on customer service and providing added benefits for their existing subscriber base. This has led to higher retention of existing subscribers as well as an increase in the new subscriber capture. The situation in the current environment between the competitors can be described as such.

- With 6 million digital subscribers added over the past year, cable providers have nearly doubled the 3.5 million users added for the DBS sector. We project 14.2 million digital cable subscribers at the end of 2001, representing 4.9 million net adds. There are currently 12.2 million digital cable subscribers.[5]
- Morgan Stanley analyst Vijay Jayant estimates total DBS additions during 2001 of 2.7 to 2.9 million versus 3.3 million in 2000. Echostar is expected to end the year with just fewer than 7 million subscribers, adding 1.5 to 1.7 million in 2001. DirectTV is expected to end the year with 10.5 to 10.7 million subscribers, an addition of 1.1 million subscribers in 2001.
- Robust consumer demand and rising programming costs render price wars an ineffective strategy. Revenue growth is expected to rise from 10 to 12 percent in 2001 and in 2002.
- Product and service bundling creates operating cost synergies and revenue growth opportunities.
- Return on Investment (ROI) is a key metric to long-term success. The DBS and cable television industries will likely maintain aggressive capital spending and product innovation strategies.
- Building subscriber management systems and data mining for marketing strategies is the next competitive frontier.

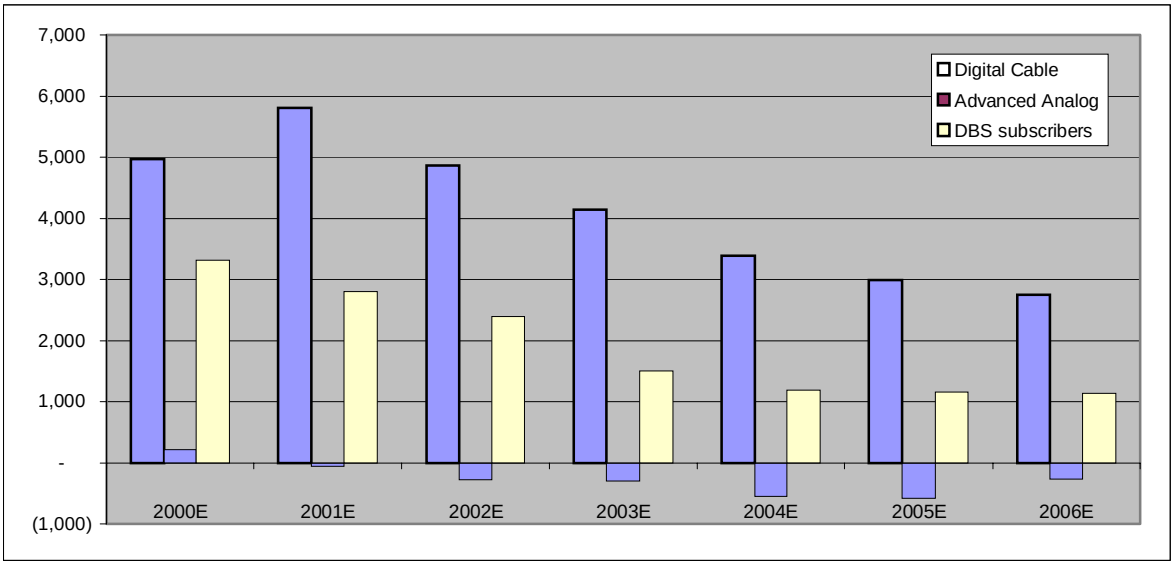
Unit growth in the cable industry has been modestly slowing on an annual basis, but the sector should provide a minimum of 5% growth over the next couple of years.[6] Depending on the rollout status of VOD, and to the extent and speed of the rollout, there is some potential upside to revenue growth.

Since the cable companies have not been in price wars with DBS providers, new service offerings have been rolled out to retain customers and gain new customers. MSOs currently offer the best digital package with respect to both total cost of package and cost per channel. VOD will

[2] Connors, Jim. "The Evolution of Cable Television" Javaworld, Oct. 1996.
[3] SunTrust Robinson Humphrey. The VOD Squad. July 31, 2001.
[4] Morgan Stanley, Broadband Cable Television, July 3, 2001.
[5] Soundview Technology Corp. Coverage Initiation on Scientific Atlanta September 25, 2001.
[6] http://www.strategyanalytics.com/press/PRDM025.htm

be the next important application in the cable industry. With issues still unresolved, some questions remain as to how quickly services will be rolled out. Subscription VOD (SVOD) should pave the way for the new service by inducing customers to begin taking premium services which in turn increases marginal revenue per subscriber.[7]

Figure 1. Projected New Subscribers (in 000s)



Source: Morgan Stanley, Broadband Cable Television July 3, 2001.

Pricing

Cable television MSOs have a pricing advantage over DirectTV and other DBS providers since rates are typically cheaper. Typical 150 channel cable packages costing approximately $75 per month usually run $9 to 14 below DirecTV's equivalent package.[8] Historically the companies have avoided price wars due to the insensitivity of the consumer in the industry. The race between cable television and DBS is a competition for market share more than a price war. Those companies that are most successful in building market share in the 50 million homes that are expected to have both digital television and a high-speed data connection will prosper. Consumers are often willing to accept higher monthly subscription rates for improved services such as PVRs or bundled access. A combination of the best technology and the best marketing will decide the ultimate winners in both fields.

Most of the cable operators now offer a selection of digital packages. The basic digital tier includes about 40 additional channels. Some operators have chosen to group the digital channels into different genres, such as family, sports, or movie channels. Many MSOs have made uniform digital packages with similar pricing across all their markets. In addition, cable operators have begun to offer digital cable packages bundled with a modem. Adelphia, for example charges $80/month for its combined services. Cox, Time Warner, and Charter have also been successful with this strategy. Most MSOs offer packages of comparable price. The average cost per channel for MSOs is approximately $0.52 per cannel while costs for DirectTV run around $0.61/channel. In addition, the total cost for DirectTV is almost $90 per package, while MSOs run around $15 lower. Echostar does offer the best deal at $0.41/channel.[9]

Both the MSOs and the DBS operators have continued to raise rates over the past couple of years, showing no intentions of future price wars. DirectTV raised basic rates by $2 for all packages in 2000, and cable operators continue to raise rates 4 to 5 percent annually. Cable

[7] SunTrust Robinson Humphrey, The VOD Squad, July 31, 2001.
[8] http://www.instat.com/rhstaging/bbw/mb0103sm.htm
[9] SunTrust Robinson Humphrey, The VOD Squad, July 31, 2001.

operators have done a good job of retaining customers through enhanced service offerings and improved customer service.

Cox Communications in the Phoenix market is one good example. The Phoenix market has become a fierce competition between Cox and DBS operators. Cox focused on upgrading its system to offer digital video, telephone, and cable modem services. After their new initiatives, basic subscriber growth continued to grow in the market for Cox after it had stagnated for several quarters. Although price increases are expected in the coming years from cable operators, we expect the hike in rates to grow around 3 to 5 percent annually.[10]

Table 3. Projected Increases in Cable Prices

	2000	2001E	2002E	2003E	2004E	2005E	2006E
Basic Rate Increases							
Adelphia	5.0%	5.5%	4.5%	4.0%	3.5%	3.5%	3.5%
Cablevision	5.8%	6.0%	5.0%	4.0%	4.0%	4.0%	4.0%
Charter Communications	5.8%	5.0%	5.0%	5.0%	5.0%	5.0%	3.0%
Comcast	4.0%	4.5%	5.0%	4.0%	3.5%	3.5%	3.5%
Cox Communications	2.6%	4.8%	5.0%	4.0%	3.0%	3.0%	3.0%
Insight Communications	6.6%	4.8%	4.0%	4.0%	3.5%	3.5%	3.5%
AOL Time Warner	4.1%	5.0%	5.0%	5.0%	5.0%	4.0%	3.0%
Analog Programming Rate Increases							
Adelphia	9.1%	8.3%	11.1%	9.6%	6.2%	6.5%	6.5%
Cablevision	4.8%	4.1%	5.0%	6.8%	5.2%	5.6%	6.1%
Charter Communications	1.0%	10.6%	8.3%	7.0%	7.0%	7.1%	5.7%
Comcast	4.7%	3.7%	6.1%	5.5%	5.2%	5.4%	5.5%
Cox Communications	12.5%	8.5%	8.2%	7.4%	6.8%	6.7%	5.5%
Insight Communications	10.1%	5.3%	4.9%	5.3%	6.0%	5.8%	7.2%
AOL Time Warner	1.5%	4.9%	8.3%	7.3%	7.1%	5.9%	5.0%

Source: Banc of America Securities

MSOs incur about $175 to 225 of marketing costs to obtain new data customers. Due to the open access policies, we expect the ISP to incur a majority of the marketing and backbone costs going forward. The cable operator would be responsible for tier one customer service, local technical expenses, and installation. The question remains how will MSOs and ISPs split the revenue per cable customer in the pipeline. AOL Time Warner has alleviated the problem by merging their businesses to take advantage of the expected synergies of the two companies going forward. With the FCC placing open access policies on the distribution of cable, this will still be of concern to the company because AOL expects to be offered over competitor cable companies' lines.[11]

Video on Demand

Background

At the beginning of 2001, there were concerns for weaker demand for new services, such as digital video, as a result of a slowing economy. Total subscribers for MSOs exceeded initial first quarter estimates by 440,000. DBS added about 800,000 subscribers, beating most estimates by about 100,000. The status of video on demand for cable operators has been one of the prevalent topics of late. Despite issues with the studios over content, the MSOs continue to believe VOD will generate incremental revenues, reduce churn, and increase digital penetration. They also hope that VOD will become the differentiator to the DBS providers. The more two-way, interactive services become prevalent, the more the cable operators will be able to

[10] Cox Communications 10-Q Report, FY00Q4.
[11] http://www.broadbandweek.com/newsdirect/0106/direct010601.htm

distinguish themselves from the DBS providers. The DBS providers are at a disadvantage because they cannot efficiently provide two-way interactive services, and the cable companies will continue to capitalize on this disadvantage.

With the slowing economy slower growth is predicted for 2002 in regards to new digital subscribers. VOD should be rolled out over the next 4 to 5 years, but usage should reach a stable plateau in 7 to 8 years. If cable operators can accelerate the VOD rollout, digital subscriber estimates could exceed initial estimates. An approximation of 4.5 to 6 million subscribers for total annual additions for MSOs is reasonable, especially with increased marketing efforts to deploy cable modem services.[12]

News Corp. CEO, Rupert Murdoch believes it will be a rat race between the DBS operators and their PVRs and the MSOs with VOD. He also stated that DBS operators, by mining their databases, can upsell certain customers to Microsoft's Ultimate TV service. This would include a hard drive, the ability to record two channels while watching a third, and the ability to fund multiple televisions off a single pay subscription.

Increased Revenues

As cable operators face increasing competition from satellite providers and telcos, video-on-demand offers a compelling opportunity for upgraded cable systems. VOD would add new revenue streams from existing cable subscribers, moving MSOs closer to the industry revenue goal of $100 per month per subscriber. VOD should be a "sticky" application and therefore helps retain and upgrade existing subscribers. VOD will also aid cable operators in recouping investments made in upgrading cable plants over the past eight years. MSOs have spent more than $45 billion to upgrade existing coaxial plant to broadband hybrid fiber/coaxial (HFC) systems. Cable operators could add up to $2.8 billion to their annual revenues through VOD services.[13] DBS providers do not have a true VOD service. For DBS providers, movies would be downloaded into a hard drive on the set-top, versus the real-time stream offered by VOD. Echostar has already begun to deploy set-tops with built in PVRs, but thus far it has been unclear as to how many have been deployed.

From presentations made at the National Cable and Telecommunications convention (NCTA) on June 10-13, it was clear that five of the top eight MSOs have made an aggressive VOD deployment initiative for 2002. Among the leading advocates of VOD were Charter, Cox, Comcast, AOL Time Warner, and Insight. Approximately 30% of digital cable homes should have access to VOD by the end of 2002 according to major MSOs. AOL Time Warner has already showcased HBO on demand, and many cable operators have signed to deploy these types of services.

Insight Communications estimated an average buy rate per VOD-enabled subscriber of 1.8 movies per month. Expected buy rates have since been reduced to 1.3 to 1.4 movies per month. Charter indicated average expected revenue per month for each VOD-enabled subscriber is about $8, versus $3.50 for customers who purchase pay per view movies. Cox has recently explored other options for content besides new releases from studios, including SVOD.[14]

Obstacles from Studios

Studios have feared the SVOD and PVRs will cannibalize revenues from the rental market. In 2000, there was $9.7 billion in rental video revenue, of which the studios received $3.4 billion. With SVOD or PVRs, studios do not receive a profit each time a customer watches the movie. So a 10% decrease in the video rental market due to SVOD or PVRs would equate to $800 million in lost revenues for studios.

Early in July 2001, Vivendi's Universal Studios signed a content agreement with In Demand for VOD movie rights for cable operators. This deal was a significant sign of continued

[12] Morgan Stanley, Broadband Cable Television, July 3, 2001.
[13] SunTrust Robinson Humphrey. The VOD Squad. July 31, 2001.
[14] Morgan Stanley, Broadband Cable Television, July 3, 2001.

progress in the pivotal content negotiations between studios and cable operators. The Vivendi agreement gave the studio a 60 percent revenue of Universal movies delivered.

Subscription Video on Demand (SVOD)

Several cable operators have announced trials with subscription video on demand. With SVOD, subscribers to a premium channel such as HBO, get to pay a fixed price per month for real-time access to HBO's content. SVOD would offer the VCR functionality that is so alluring to VOD. The pricing strategy behind SVOD has been the talk of the cable community. Adelphia, for example, plans to offer SVOD as a feature of the premium subscriptions with no additional fee. AOL Time Warner has plans to test several pricing techniques for SVOD. VOD is much like a real-time pay per view, in which the customer pays $4 per movie, while SVOD would require a monthly fee. The expected monthly fee for SVOD is expected to cost less than one VOD movie, making it rather desirable for each household to subscribe.[15]

VOD Deployment

The main difference between VOD and PVR capabilities is the location of storage of the data. For example, PVRs are hard drives built into set top boxes which allow a user to record data for viewing purposes much like a VCR or TIVO system. VOD stores data on servers, which can be accessed real time by its users. VOD basically allows for a central storage area for a number of users and does not limit users to recording times, much like having a DVD library to access on a server.

For Internet streams that play at about 200 Kbits/second, a typical server can transmit about 8,000 simultaneous streams. For MPEG-2 standard definition video files requiring about 3 Mbits/second, mid-range servers can deliver 100 to 300 simultaneous video streams.[16] Very large VOD servers can dish out several thousand simultaneous program streams and store hundreds of full-length movies.[17]

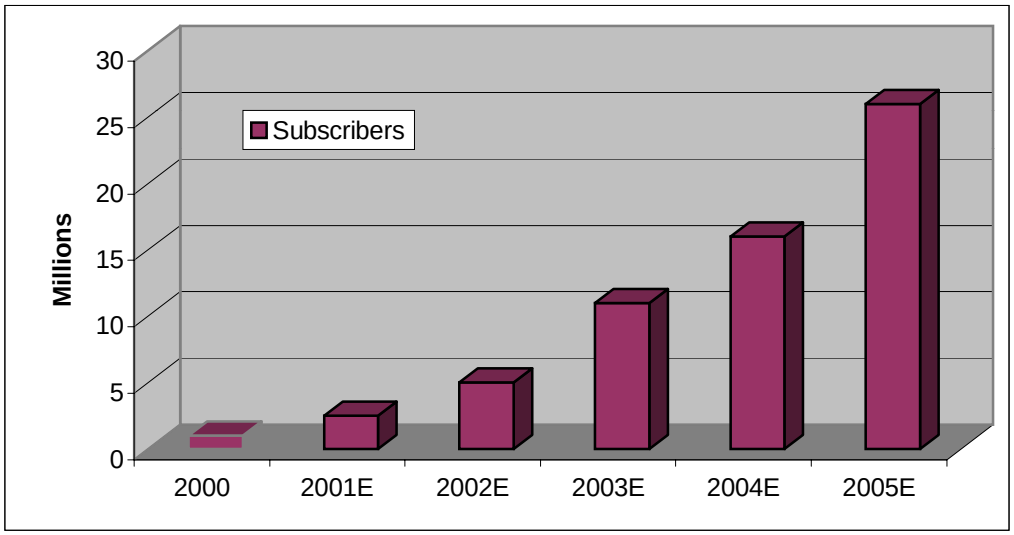
Cable systems are counting on digital media servers that provide VOD to help them reach their goal of converting half of their subscribers to digital services within five years. Cable companies will typically deploy digital media servers that support up to 3,000 simultaneous video streams at their headends and smaller hub servers that support about 500 streams at the neighborhood level. Each hub server can provision VOD to about 5,000 homes.[18]

The following include some assumptions about technical aspects and costs for VOD deployment for cable operators.

- Cable companies are deploying one VOD stream for every 10 VOD enabled subscribers. This 10% peak simultaneous usage rate should satisfy demand during peak usage.
- The cost per additional stream will decline from $640 to $255 in 2006.
- Typical cable operator will deploy VOD to about 90% of digital customers by 2006.
- Useful life of a VOD server to a cable operator is approximately 3 years, after which it will require replacement.
- An increase in demand for VOD will be driven by an increase in availability of content from film studios. Cable operators believe that they can achieve 3.5 to 4 video rentals per month from each subscriber, if they were to have access to similar content available in home video stores.

[15] SunTrust Robinson Humphrey. The VOD Squad. July 31, 2001.
[16] Banc of America Securities, The Cable Warrant, June 21, 2001.
[17] http://www.instat.com/rhstaging/bbw/mb0103sm.htm
[18] Banc of America Securities, The Cable Warrant, June 21, 2001.

Figure 2. Projections for VOD Subscribers



Source: Suntrust Robinson Humphrey

Pros for VOD deployment

- VOD rates are anticipated at 1.8 to 2 movies per month, which equates to a significant return on investment.
- Deployment of VOD gives cable a strategic advantage over DBS operators.
- Cable needs to increase its VOD base as soon as possible so that it can improve their leverage with the studios to gain access to the latest releases.
- VOD is the most efficient and economical distribution platform for a film studios' content.

Obstacles for VOD deployment

Cable operators need the content from the film studios more than the film studios need the distribution. Film studios will not generate significant revenues from a small VOD base; therefore, cable companies need to build up the base for studios to take notice. Approximately 15 percent of total MSO subscribers now have digital set top boxes. The critical mass for VOD deployment is approximately 20 to 25 percent digital penetration. Although the critical mass is not yet available in the market, the cost to distribute content via VOD cannot be matched by any other rental medium.[19]

One studio executive was quoted as saying "every time a new distribution platform becomes available, our library becomes more valuable." We expect some studios to lead the way, which will cause other studios to sign on in fear of missing out on new revenues. If the cable operators can convince studios that VOD has added value to studios' markets rather than just cannibalizing rental sales, VOD could be deployed significantly quicker than expected.

DBS Counter to VOD

By 2003, DirecTV will shift from its DirecPC telephone-return system to a Ku-band satellite system called Spaceway. A partnership with Hughes, Spaceway promises to bring faster, two-way connections. DirecTV also has a partnership with America Online and hopes to offer two-way connections soon using Ku-band satellites, the FCC said.[20]

EchoStar has a stake in Starband, formerly Gilat-2-Home. Starband, which aims shortly to begin offering two-way, high-speed Internet services, launched its first satellite in November and also boasts Microsoft as a partner. EchoStar also has invested in Wildblue, formerly iSky,

[19] SunTrust Robinson Humphrey. The VOD Squad. July 31, 2001.
[20] Ross, Patrick. "Cable's broadband lead whittled by DSL, satellite services" CNET news. Jan. 9, 2001.

which will use Ka-band and spot-beam technology to deliver two-way, high-speed services later this year. WildBlue's other prominent investors include Gemstar, Liberty Media, Kleiner Perkins Caufield & Byers, TRW and TeleSat.

The FCC was cautious as to how much success these ventures might have, saying their strongest chances lay "in the estimated 20 to 30 million homes in rural and suburban areas that may be unable to receive cable or DSL for the foreseeable future."[21]

High Speed Data

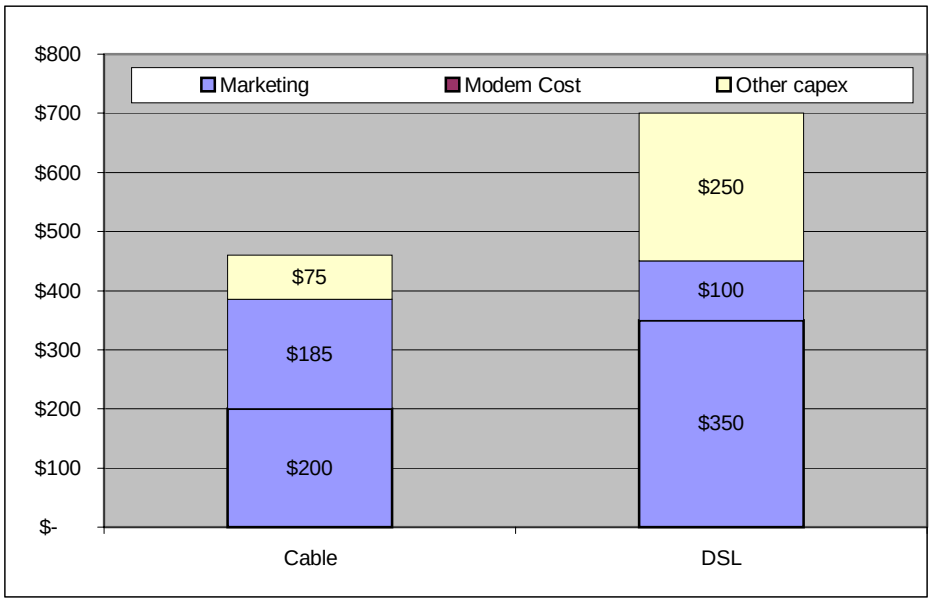
MSOs are enjoying a 70 percent share of the residential broadband Internet marketplace, according to one new study, leaving DSL providers in the dust. Of the 9.3 million North America households that subscribe to a high-speed Internet service, 6.4 million get their access via cable modems.[22] In 2000, North American cable companies added 3 million customers, bringing digital penetration to 12% of cable homes. In the UK, operators have finally begun to roll out digital services over the past twelve months. But in most parts of Europe digital cable is behind schedule, only 7% of cable homes have so far switched to a digital service.[23] DSL providers including the Baby Bell local phone companies tallied 1.4 million new subscribers over the last year.[24] By 2004 nearly half of all Internet connections in the United States will be high-speed broadband.

The DSL market has hit some obstacles recently. Higher prices and slower deployments have hampered the outlook for residential DSL. In many markets the monthly charge for DSL has gone up to $50, a 25% increase. Operating costs, particularly customer service, marketing and maintenance, have been higher than expected. Subscriber acquisition costs have been about $350 to 375 per subscriber, $200 to 300 more for RBOCs than for cable companies.[25]

“The first strategy is to deploy IP-based networks and provide client/server software on top of that to allow our customers to move into an interactive world as opposed to a broadcast world,” says Jim McDonald, CEO of Scientific Atlanta. “Cable operators have the superior technology to satellite service to be able to do this.”[26]

[21] SunTrust Robinson Humphrey. The VOD Squad. July 31, 2001.
[22] http://www.broadbandweek.com/newsdirect/0106/direct010601.htm
[23] http://www.strategyanalytics.com/press/PRDM025.htm
[24] Grice, Cory. “Broadband Access Nearly 8 Million Strong” CNET news. February 28, 2001.
[25] Morgan Stanley, Broadband Cable Television, July 3, 2001.
[26] Iler, David. “What Does the New Age Hold for Scientific Atlanta?” Broadband Week, February 19, 2001.

Figure 3. Subscriber Acquisition Costs Cable vs. DSL



Source: SunTrust Robinson Humphrey

Home Networking

Cable operators may soon take the lead in pushing home networking as a premium service to subscribers. Cable operators believe that cable subscribers are unlikely to buy "home networking" as a package, but would order services such as IP telephony and multiple PC connectivity. Home networking refers to multiple devices in the home, including the television, a PC, and non-PC digital devices, all able to communicate to users inside and outside the home. The potential business models for home networking remain a critical element. Models include offering network management and security services, packaging the service with digital video offerings, or generating service fees through installations.[27]

The most effective proposed business model is an integrated solution built into the basic video and cable modem service. Although a customer may not buy a complete networking solution, they will buy incremental services that can be implemented through networking.

International Cable Market

With a 7.8 percent CAGR, cable spending will reach $221 billion by 2005. Asia/Pacific ($36 billion in 2005) and Latin America ($9 billion in 2005) will be the fastest-growing regions, fueled by large increases in multi-channel penetration. The U.S. will be the slowest-growing market, with a CAGR of 6.9 percent. Sluggish growth in television station advertising will offset rising DBS and digital cable subscriptions.[28]

Asia is within sight of overtaking the United States as the world's biggest market for high-speed Internet connections, with analysts and industry players predicting as many as 11 million subscribers will have switched to broadband across the region by the end of 2001. Internet think-tank Gartner Group predicts a massive 34 million fixed-line subscribers by 2004, with the vast majority living in South Korea, Japan and China. "In three years, China could have up to 20 million subscribers, and then you add to that Korea, where they are mad about speed, and almost between them you could reach 35 million," says one industry expert. Gartner is more

[27] Grice, Cory. "Broadband Access Nearly 8 Million Strong" CNET news. February 28, 2001.
[28] "PWC Forecasts Growth for Global Entertainment and Media" The Write News, June 6, 2001.

conservative, predicting 7.6 million broadband subscribers by the year's end. Nonetheless, Gartner forecasts around 14 million broadband subscribers using cable modems in Asia-Pacific by 2004, with Japan tipped to be the only country where cable will dominate over DSL for the foreseeable future.[29]

Growth Drivers

The future growth of the DBS and cable sectors will mainly be based on each company's ability to convince consumers to increase their monthly spending for television programming. Approximately 80 million households currently have multi-channel programming, which makes up a majority of the US population. Instead of focusing on new subscribers, the company focus will shift to increasing revenues per subscriber by selling larger packages of subscription channels, video on demand, and high speed data services.

Cable television operators will overlay VOD capabilities across 25 to 30% of its footprint by the end of 2002 and the rollout should be complete by 2005. Impediments to VOD have been access to content, although recording programming that is broadcast on a channel is permissible. Obtaining movie rights during the video store window and then offering to download the titles for $3 to 4 per movie to a PVR will require renegotiating new content agreements.

High speed data services are the most formidable competitive advantage held by MSOs. By the end of this year, high speed data services should be offered to all cable households in the United States (80 million) or 80% of the households in the United States. By the end of 2005, half of the households (40 million) should have high speed data services. RBOC's should gain the remaining 50% of the households with DSL.[30]

Typical MSOs spend less than 3% of their revenue on subscriber management systems. The systems usually simply contain billing information and do not store any information about the customer. Some DBS providers have developed subscriber database systems, which resemble direct marketing databases. The database stores information about its customers and which currently purchase the different types of services. This allows the companies to deploy targeted marketing strategies. For example, premium subscribers would be the first homes to receive offers to buy set tops with PVR capabilities. Younger subscribers would receive offers to purchase DSL modems. Data mining is a long time tactic of magazines, but cable companies have not taken advantage of it.[31] AOL Time Warner will most likely pioneer this tactic in the cable industry since AOL already had this type of customer management prior to its merger.

Recent Developments and Results

During the past quarter's earnings announcements, several cable companies have commented on their strategies going forward and the current results of those strategies. Cablevision said on its call that bundling video and cable modem services has had encouraging results: 28% of the company's video subscribers in Nassau County, N.Y., have signed up for high-speed Internet service, too, as have 23% of video subscribers in Fairfield County, Conn. In a measure of the company's progress in cutting installation expense, Cablevision said that 85% of the company's cable modem sales in the first quarter were self-installed by customers, and 85% of those self-installs were successful, not requiring subsequent visits by Cablevision personnel.[32]

The company's head of engineering and technology, Wilt Hildenbrand, took pains to tell analysts that Cablevision's upgrade to digital technology, costing about $100 for a household that could be served in its service area, will make it easy for the company to offer a variety of

[29] Hopkins, Nick. "Asia poised for Broadband boom" CNN News, January 8, 2001.
[30] Ross, Patrick. "Cable's broadband lead whittled by DSL, satellite services" CNET news. Jan. 9, 2001
[31] "PWC Forecasts Growth for Global Entertainment and Media" The Write News, June 6, 2001.
[32] Mannes, George. "Cable Companies Talking up Video on Demand" TheStreet.com, May 8, 2001.

new products, including video-on-demand and Internet-based telephony, without making any trips to subscribers' households.

Comcast, in its earnings announcement, proclaimed that the payoff of new technology, especially in newly acquired cable TV systems, is already here. Following the addition of nearly two million subscribers, the company sees "significant growth opportunities in these systems as we begin to accelerate the delivery of new digital and data services," said Comcast President Brian Roberts. Based on this, he said, the company is raising its full-year 2001 guidance for cable cash flow growth from a range of 10% to 11% to roughly 12% to 13%.[33]

AOL Time Warner Advantage

Bundling aspects can be a very powerful tool in the cable industry. By the end of this year, AOL will reach 25% of the homes in the United States, and most of the users will have dial up connections. AOL can market broadband upgrades to its subscribers, thus the cable providers can market a national name in its efforts. AOL can win customers who currently have DBS systems by bundling a high-speed data connection as well as digital television. Approximately 30 to 40 percent of DBS households have AOL dial up services. The overlap between DBS and AOL households is most likely about 5 to 7 percent of the typical market.

AOL Time Warner has been leading the sector into the multiple ISP environments. AT&T Broadband was the first to announce an open access trial due to regulatory pressure. Cox has deployed AOL Plus in its Arkansas system trial. Two other operators have announced that they will no longer use Excite@Home as their exclusive ISP.

AOL Time Warner is the largest ISP and the second largest US cable operator. AOL Time Warner has been placed on regulatory order due to the overlap between their cable and ISP services. AOL is currently being held to three primary conditions. It must offer one rival broadband ISP access to its cable system before AOL can begin such service, followed by at least two additional services within 90 days. It is prevented from disrupting the flow of content being provided to consumers through rival ISPs or interactive TV services on its network. And it is required to offer AOL's digital subscriber line services equally to all subscribers.[34]

[33] Comcast Earnings Call
[34] Hansen, Evan. "FTC decision forecasts future of cable Net access" CNET news. December 14, 2000.

Company Background and Analysis

Table 4. Comparable Company Analysis

Firm	Price ($)	52-week high ($)	52-week low ($)	Mkt. Cap ($M)	Debt ($M)	2001 EPS	2002 Proj. EPS	Price/ Book
AOL Time Warner	33.50	58.51	27.40	148,405	20,725	1.21	1.39	0.93
Adelphia	24.24	52.25	18.76	4,196	14,850	-3.57	-3.42	0.79
Cablevision	36.60	91.50	35.00	6,416	6,593	-2.42	-3.17	-
Charter Communications	14.20	24.45	10.49	4,178	15,655	-4.38	-4.05	1.14
Comcast	36.88	46.31	31.99	34,870	11,495	-0.80	-0.20	2.31
Cox Communications	39.57	50.25	36.00	23,758	7,847	-0.73	-0.53	2.42
RCN Corporation	3.03	19.13	1.75	295	2,497	-11.59	-10.6	-
Rogers Communications	13.48	20.44	11.00	2,824	5,370	-1.5	-1.63	-
United GlobalCom	1.10	33.81	0.50	109	12,349	-20.05	-15.86	-

Sources: Yahoo Finance, 10-26-01, 2002 estimates are from average estimates of covering Wall Street Analysts.

Table 5. Valuation by Subscribers

Firm	2001E Subscribers	Price/ Subscr.	2002E Subscribers	Price/ Subscr.
AOL Time Warner	11,307	$ 13,125	11,535	$ 12,866
Adelphia	5,909	$ 710	5,986	$ 701
Cablevision	3,012	$ 2,130	3,060	$ 2,097
Charter Communications	6,891	$ 606	6,971	$ 599
Comcast	8,426	$ 4,138	8,517	$ 4,094
Cox Communications	6,286	$ 3,779	6,362	$ 3,734
RCN Corporation	410	$ 719	502	$ 587
Rogers Communications	2,291	$ 1,233	2,266	$ 1,246
Industry Average		**$ 3,305**		**$ 3,241**

Table 6. Valuation by EV/EBITDA Ratios

Firm	2001E EBITDA	2001 EV/EBITDA	2002E EBITDA	2002E EV/EBITDA
AOL Time Warner	6,930	24.4	8,316	20.3
Adelphia	1,463	13.0	1,695	11.2
Cablevision	791	16.4	901	14.4
Charter Communications	1,755	11.3	2,014	9.8
Comcast	2,784	16.7	3,330	13.9
Cox Communications	1,593	19.8	1,889	16.7
RCN Corporation	(327)	-	(167)	-
Rogers Communications	936	8.8	1,129	7.3
United GlobalCom	(579)	-	500	24.9
Industry Median		**13.0**		**13.9**

Adelphia Communications (ADLAC)

Adelphia, Greek for "brother", is a family-run cable TV company. Its subscriber base is 5.7 million in 32 states and in Puerto Rico. It has grown from acquisitions that offer digital TV via its upgraded cable lines and high-speed Internet services. Aside from broadband, Adelphia offers to its residential customers dial-up Internet services, wireless messaging, and long-distance phone service through its Time Page subsidiary. Through another subsidiary called Adelphia Business Solutions, formerly known as Hyperion Telecommunications, a competitive local exchange carrier (CLEC), it offers to its business customers local and long distance telephony, data networking, and Internet services.

AOL Time Warner (AOL)

The combination of the old media giant Time Warner and new media giant America Online has formed an even bigger giant that brings together countless number of assets – AOL Internet portal, Instant Messenger, Netscape, ICQ, Compuserve, AOL Movie Phone, Time Warner, HBO, Road Runner high-speed Internet service, Turner Broadcasting System (TNT, CNN, Cartoon Network, Atlanta athletic teams), Time Warner Telecom, and New Line Cinema. This media behemoth has over 80,000 employees, $7.7 billion in 2000 sales, $1.1 billion in 2000 net income, and a market capitalization of $148 billion as of the close of October 26, 2001.

Cablevision Systems (CVC)

Unlike its competitors, Cablevision chose to concentrate most of its assets around New York City. It has three million subscribers to its cable systems. In addition, it owns a wide array of programming and entertainment assets. It plans to offer telephony services via its cable networks. It also operates the competitive local exchange carrier called Lightpath.

Cablevision has majority interests in Rainbow Media Holdings that operates five national cable networks like Bravo and American Movie Classics. Some of the company's more notable entertainment assets are Madison Square Garden, the Knicks, the Rangers, 65 Clearview Cinema theaters, the Wiz electronics stores, and Radio City Entertainment that includes the Music Hall and the Rockettes.

The Chairman Charles Dolan and his family control the voting stocks.

Charter Communications (CHTR)

Charter Communications is one of the leading cable TV operators in the country. 94% of the voting power rests on billionaire Paul Allen's hands. The company has 6.9 million cable customers in 40 states; most of them are concentrated in only 14 states. It already has 1 million subscribers for digital cable and 252,000 subscribers for high-speed Internet access. Currently, it is spending $3.5 billion to upgrade its cable systems for broadband communications. In the past year, it has acquired 12 companies.

Comcast Corporation (CMCSK)

Comcast derives its name from "communications" and "broadcast". Lately this cable system operator has been investing quite significantly to upgrade its fiber optics and high-speed Internet services. After the purchase of cable systems in six states from AT&T, Comcast' subscriber base has increased to 8.5 million. Of that total, 1.4 million are digital cable customers and 400,000 are high-speed Internet users. If Comcast's unsolicited bid to buy the rest of AT&T's cable operations were successful, it would become the largest cable TV operator.

57% of Comcast's sales come from the global e-tailer QVC. It has 40% interest in E! Entertainment, a joint venture with Disney. Its other interests are with the venture that owns

Philadelphia Flyers and 76ers as well as with SportsNet, the local network that broadcasts the two professional teams.

Cox Communications, Inc. (COX)

Cox Communications is a 67% subsidiary of Cox Enterprises, which also owns TV broadcasting, newspaper, and radio subsidiaries. Cox Communications is an industry leader in the rollout of digital cable, cable telephony, and high-speed data services. Phoenix is currently the company's largest market. The company is currently test-marketing Video On Demand (VOD) in both the San Diego and Hampton Roads, VA markets to compete with Direct Broadcast Satellite (DBS) companies. The San Diego test is already a significant market share of over 100,000 households. *(Standard and Poor's, Aug. 31, 2001)* All of Cox Communications' earnings are produced by its Cable TV activities.

RCN Corporation (RCNC)

RCN Corporation is a relatively small company that has invested in an advanced fiber-optic network. Industry analysts refer to this strategy as "overbuilding", because the network capacity exceeds current demand. Overbuilding requires access to capital markets, which has become more difficult in 2001. As a result, forecasts for growth for RCN have been somewhat decreased. *(MSDW, Broadband Cable TV, July 3, 2001*) Currently, approximately half of its customers are on its fiber optic network, and this figure is expected to rise to 90% in five years. The company's strategy is to provide a bundled package of local and long-distance telephone, cable TV, and Internet services to the residential market. It calls this bundle "ResiLink". The company is targeting high-growth, high-density markets in the NE Corridor, San Francisco to San Diego corridor, and the Chicago metropolitan area. Its fiber optic network passes 1,263,000 homes and the company is expected to triple this amount over the next several years.

Paul Allen's Vulcan Ventures currently holds a 27% stake in RCN, and RCN is pursuing joint ventures with Allen's company Charter Communications. *(Standard and Poor's, Dec. 6, 2000)*

Rogers Communications, Inc. (RG)

Rogers Communication, Inc. (RCI) is a Canadian company that provides cable access, Internet access and wireless services. Its wireless service is the largest in Canada, with 3 MM subscribers. RCI's wireless division is expected to produce approximately two-thirds of the company's earnings in the future. RCI has the largest contiguous cable territory in Canada, providing significant cost advantages in cable service. The company has approximately 2.2 MM basic cable subscribers in Canada, 1.3 MM tier three customers, and 140,000 digital subscribers. *(Standard and Poor's, Dec. 5, 2000)*

United Globalcom, Inc. (UCOMA)

United Globalcom, Inc. (UGC) is a complex broadband company which has recently expanded aggressively to provide video, voice, and data services in 26 countries. The company serves a total of 10.6 MM video customers. It is a more significant player in the Cable TV industry than its current market cap would suggest. UGC currently produces negative earnings, but is predicted by Morgan Stanley's analysts to achieve positive earnings in 2002. The current negative earnings are a result of significant customer acquisition and SG&A costs generated by expanding into new markets with the Triple Play services described below. The forecast of positive earnings assumes that these investments will pay off. UGC's network currently passes approximately 4.3MM homes, with a penetration of approximately 60% for basic cable services.

Liberty Media has recently made substantial investments in UGC, and is expected to own 44% of UGC by 2002. Liberty Media is also a 4% shareholder in AOL Time-Warner. Liberty Media is currently planning to purchase the cable TV portion of Deutsche Telecom.

UGC in turn owns 53% of United Pan-Europe Communications (UPC). UPC is the largest cable operator in Europe, operating in 13 European countries, particularly the Netherlands, Austria, Poland, and France, and also Israel. It is UGC's largest subsidiary.

As part of Liberty's investment in UGC, UGC will acquire several of Liberty Media's assets, including 50% of Cablevision SA, the largest cable TV company in Argentina. Economic conditions are expected to remain weak in Chile and Argentina in the near future.

UGC is also the largest pay TV provider in Australia, through its 81% subsidiary AUSTAR Entertainment. Austar has generated negative cash flow and seen its market value diminish significantly since its 1999 IPO.

Profitability measures for UGC are negative at present, because the company is investing very heavily in introducing its "Triple Play " strategy. This strategy consists of cable telephony, digital entertainment tiers, and high-speed data services. Cable cash flow has been EBITDA positive, but subscriber acquisition costs and SG&A expenses have caused negative cash flow. Company guidance indicates that it expects to become EBITDA positive in 2002. The European subsidiary UPC has for several years been acquiring cable companies in different countries, investing in upgrading the cable systems, and rolling out its "Triple Play" strategy at significant cost. UGC's EBITDA has therefore been negative. It remains to be seen if the Triple Play investment will return sufficient sales to become profitable. *(Standard and Poor's, Sept. 7, 2001)*

Table 7. Projected Revenues for Cable Providers

Total Revenue- Analog, Digital, & Data							
(in $millions)	**2000**	**2001E**	**2002E**	**2003E**	**2004E**	**2005E**	**2006E**
Adelphia	2,874	3,196	3,604	4,012	4,425	4,869	5,356
Cablevision	1,911	2,103	2,367	2,632	2,904	3,188	3,492
Charter Communications	3,601	4,146	4,792	5,421	6,077	6,782	7,472
Comcast	4,721	5,292	6,010	6,747	7,447	8,159	8,885
Cox Communications	3,369	3,746	4,232	4,705	5,176	5,653	6,143
Insight Communications	667	725	829	943	1,061	1,178	1,302
AOL Time Warner	6,054	6,966	8,019	9,067	10,070	11,003	11,938
RCN Corporation	111	209	320	426	526	601	653
US CATV Industry	**31,246**	**35,139**	**39,971**	**44,797**	**49,621**	**54,440**	**59,325**
Growth Rate	*12%*	*13%*	*14%*	*12%*	*11%*	*10%*	*9%*
Telephony Revenue							
Adelphia	-	-	5	46	188	473	844
Cablevision	10	15	30	68	141	233	324
Charter Communications	-	-	13	51	127	247	435
Comcast	-	-	10	49	144	348	640
Cox Communications	106	196	288	389	497	609	710
Insight Communications	-	2	10	29	55	79	97
AOL Time Warner	-	-	-	34	173	512	1,123
RCN Corporation	54	113	185	242	269	280	285
US CATV Industry	**336**	**809**	**1,488**	**2,325**	**3,561**	**5,301**	**7,417**
Growth Rate	*192%*	*141%*	*84%*	*56%*	*53%*	*49%*	*40%*
Total Revenue- Analog, Digital, Data, & Telephony							
Adelphia	2,874	3,196	3,609	4,057	4,613	5,342	6,200
Cablevision	1,921	2,118	2,397	2,699	3,045	3,421	3,816
Charter Communications	3,601	4,146	4,805	5,472	6,204	7,029	7,907
Comcast	4,721	5,292	6,020	6,795	7,591	8,507	9,525
Cox Communications	3,476	3,942	4,520	5,094	5,673	6,262	6,852
Insight Communications	667	727	839	971	1,116	1,257	1,398
AOL Time Warner	6,054	6,966	8,019	9,101	10,243	11,516	13,060
RCN Corporation	166	322	505	668	794	880	938
US CATV Industry	**31,582**	**35,947**	**41,459**	**47,122**	**53,182**	**59,740**	**66,742**
Growth Rate	*12%*	*14%*	*15%*	*14%*	*13%*	*12%*	*12%*

Source: Morgan Stanley, Broadband Cable Television July 3,2001

Table 8. Projected Subscribers

(in thousands)	2000A	2001E	2002E	2003E	2004E	2005E	2006E
Basic Subscribers							
Adelphia	5,856	5,909	5,986	6,056	6,122	6,185	6,245
AT&T	13,821	13,853	13,882	13,912	13,941	13,970	13,999
Cablevision	2,960	3,012	3,060	3,104	3,144	3,181	3,214
Charter Communications	6,863	6,995	7,116	7,227	7,329	7,421	7,514
Comcast	8,334	8,426	8,517	8,607	8,696	8,784	8,871
Cox Communications	6,193	6,299	6,395	6,493	6,592	6,693	6,795
Insight Communications	1,279	1,297	1,315	1,332	1,348	1,363	1,377
AOL Time Warner	11,158	11,307	11,535	11,714	11,886	12,050	12,207
Total Basic Subscribers	**56,463**	**57,098**	**57,807**	**58,445**	**59,058**	**59,647**	**60,223**
Additions	*1,250*	*635*	*709*	*638*	*613*	*590*	*576*
RCN Corporation	267	410	502	600	666	692	714
Rogers Communications	2,219	2,291	2,266	2,243	2,221	2,198	2,198
Cogeco	882	895	883	869	859	849	847
Shaw	1,836	2,182	2,196	2,206	2,214	2,221	2,222
Total Canada and Other	**5,204**	**5,777**	**5,847**	**5,919**	**5,959**	**5,960**	**5,981**
Total North America	**61,667**	**62,875**	**63,654**	**64,363**	**65,016**	**65,608**	**66,204**
Digital Video Subscribers							
Adelphia	904	1,737	2,208	2,557	2,775	2,946	3,087
AT&T	2,430	3,501	4,424	5,202	5,887	6,475	6,984
Cablevision	0	50	333	596	833	1,109	1,408
Charter	1,070	2,197	2,770	3,231	3,684	4,087	4,511
Comcast	1,495	2,131	2,823	3,320	3,752	4,124	4,442
Cox	842	1,343	1,817	2,255	2,687	3,124	3,552
Insight	152	296	406	527	620	696	758
AOL	1,564	3,013	4,343	5,577	6,419	7,088	7,655
Total Digital Subscribers	**8,457**	**14,269**	**19,125**	**23,264**	**26,656**	**29,649**	**32,398**
Additions	*4,973*	*5,812*	*4,856*	*4,139*	*3,392*	*2,993*	*2,748*
RCN	44	127	219	299	353	388	411
Rogers	201	304	424	577	713	840	950
Cogeco	98	127	156	196	240	282	318
Shaw	165	287	419	597	760	884	995
Total Canada and Other	**508**	**845**	**1,218**	**1,669**	**2,067**	**2,393**	**2,674**
Total North America	**8,965**	**15,114**	**20,343**	**24,933**	**28,723**	**32,042**	**35,072**
DBS							
DirecTV	9,543	10,642	11,602	12,202	12,672	13,132	13,584
Echostar	5,260	6,960	8,400	9,300	10,005	10,695	11,373
Total	14,803	17,603	20,002	21,502	22,677	23,827	24,957
Additions	3,314	2,800	2,400	1,500	1,175	1,150	1,130

Source: Morgan Stanley

Table 9. Cable Modem Industry Projections

North American Cable Modem Estimates (In thousands)								
	1999	**2000**	**2001E**	**2002E**	**2003E**	**2004E**	**2005E**	**2006E**
Adelphia	1,671	3,716	7,215	8,322	8,447	8,573	8,702	8,832
AT&T	9,748	13,886	16,036	22,030	23,532	23,885	24,244	24,607
Cablevision	874	2,000	4,023	4,439	4,586	4,651	4,720	4,791
Charter Communications	3,468	5,551	7,907	10,347	11,119	11,507	11,714	11,924
Comcast	3,652	6,360	10,443	14,152	14,364	14,579	14,798	15,020
Cox Communications	4,099	7,123	8,472	10,176	10,329	10,484	10,641	10,800
Insight Communications	580	1,204	1,691	2,079	2,110	2,142	2,174	2,206
AOL Time Warner	8,875	13,102	16,623	16,873	17,126	17,383	17,644	17,908
Other	2,500	5,500	5,775	6,064	6,367	6,685	7,020	7,371
US HSCDS Homes Passed	**35,466**	**58,442**	**78,185**	**94,481**	**97,979**	**99,889**	**101,655**	**103,460**
RCN Corporation	551	1,100	1,475	1,715	1,906	1,906	1,906	1,906
Rogers Communications	2,630	2,631	2,737	2,769	2,802	2,852	2,895	2,961
Cogeco	921	1,062	1,237	1,250	1,267	1,282	1,295	1,308
Shaw Communications	1,542	2,196	2,849	2,898	3,010	3,101	3,151	3,200
Total Canada and Other	**5,643**	**6,990**	**8,297**	**8,633**	**8,985**	**9,141**	**9,247**	**9,375**
Total North America	**41,109**	**65,431**	**86,482**	**103,114**	**106,965**	**109,030**	**110,902**	**112,835**
Adelphia	37	149	406	703	1,052	1,464	1,930	2,504
AT&T	363	962	1,716	2,636	3,528	4,560	5,579	6,596
Cablevision	52	239	500	739	974	1,204	1,419	1,599
Charter Communications	66	225	634	1,074	1,548	2,075	2,660	3,295
Comcast	159	494	905	1,577	2,233	2,910	3,537	4,184
Cox Communications	204	482	959	1,469	1,975	2,449	2,843	3,182
Insight Communications	8	52	106	189	275	366	454	546
AOL Time Warner	307	880	1,704	2,434	3,210	3,981	4,710	5,504
Other	130	303	491	661	816	960	1,094	1,221
US HSCDS Subscribers	**1,326**	**3,784**	**7,421**	**11,483**	**15,611**	**19,970**	**24,227**	**28,631**
Growth	*234%*	*185%*	*96%*	*55%*	*36%*	*28%*	*21%*	*18%*
RCN Corporation	22	67	122	204	282	350	404	440
Rogers Communications	186	312	469	559	639	707	766	820
Cogeco	51	85	113	146	179	223	265	294
Shaw Communications	185	352	605	723	867	999	1,105	1,191
Total Canada and Other	**443**	**816**	**1,309**	**1,632**	**1,969**	**2,279**	**2,541**	**2,745**
Growth	*230%*	*84%*	*60%*	*25%*	*21%*	*16%*	*12%*	*8%*
Total North America	**1,769**	**4,600**	**8,730**	**13,114**	**17,580**	**22,249**	**26,768**	**31,376**
Growth	*233%*	*160%*	*89%*	*50%*	*34%*	*27%*	*20%*	*17%*

Source: Morgan Stanley

Appendix: Terminology

MSO (Multiple Service Operator): An MSO is a TV channel provider such as AOL or Cox.

DBS (Digital Broadcast Satellite): A system similar to cable TV in which all TV channels are received from a single MSO, but by satellite transmission rather than a cable. DBS does not allow 2-way Internet communication, which limits its ability to compete with cable. DBS dishes are much smaller than the old-style satellite dishes.

DirectTV: DirectTV is currently the market leader among DBS services.

VOD (Video on Demand): A feature of Cable TV through which subscribers can select videos to watch. The goal of VOD is to replace VCR tape rentals.

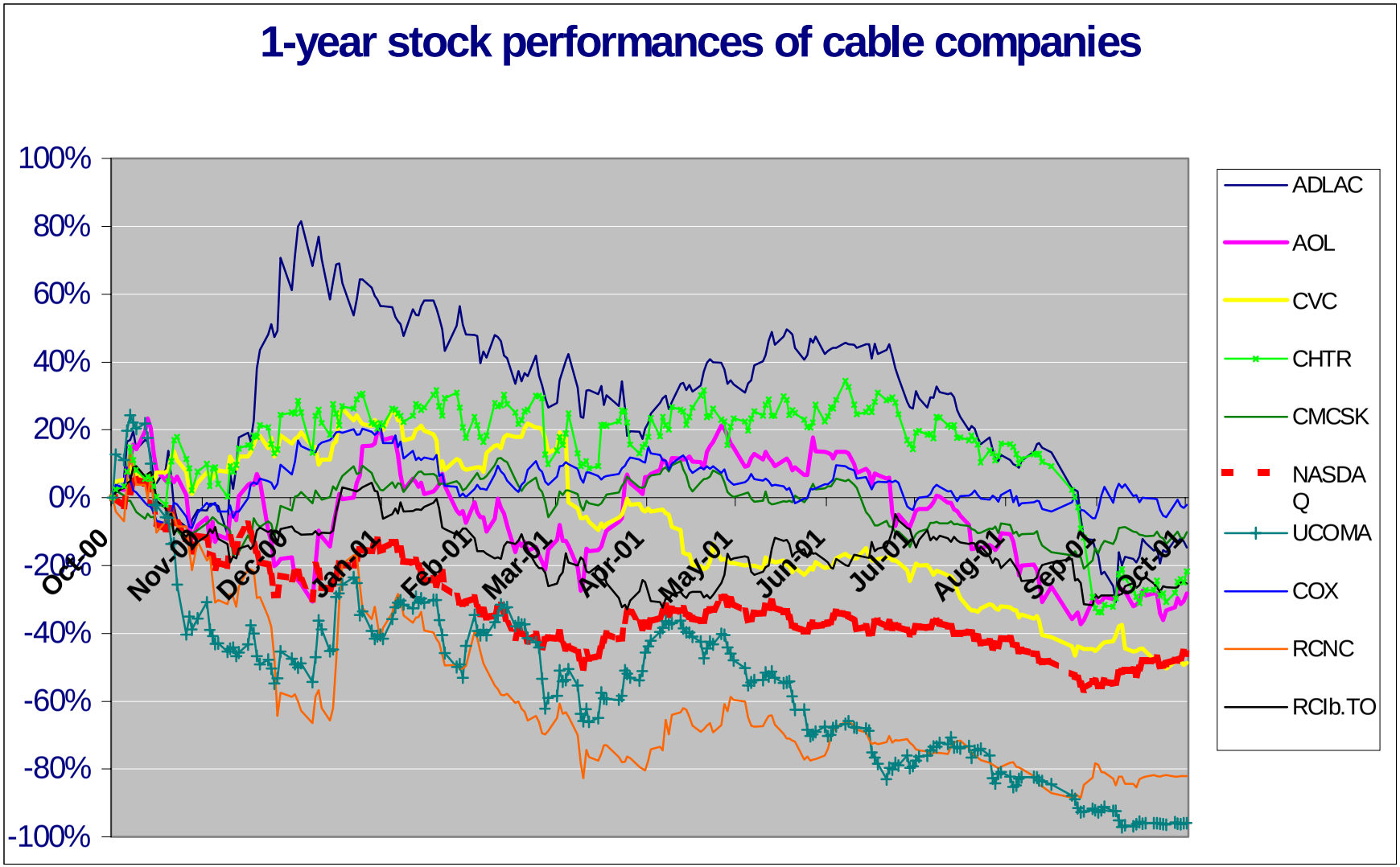
PVR (Personal Video Recorder): A device that has a hard drive and allows the viewer to stop or replay live TV. Examples are Tivo and Replay/TV.

STB (Set-Top Box): A cable TV control box, usually provided by the cable TV operator. "Thick-client" STB's have more features, such as memory and a hard-drive for PVR's.

ISP: Internet Service Provider

HSCDS (High-Speed Cable Data Services): This is the third service typically bundled by MSO's for sale to households, along with telephony and Cable TV.

1-year stock performances of cable companies



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