Chapter 8

The Emerging Wireless Value Chain and Capital Market Perceptions

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1. INTRODUCTION

During the last 12 months, investor sentiment toward wireless carriers, pure play wireless data companies, and equipment vendors has undergone substantial swings, as enthusiasm over the prospects for the transition from today's voice-centric wireless networks to a new generation of data–enabled wireless networks has ebbed and flowed. 3G, the technology that would allow for streaming video, color screens and a fast connection to the Internet, wirelessly, was expected to bring wireless data to the next level. Thus, new "parts" of the wireless value chain evolved, and were believed to be key drivers in bringing 3G technology to everyday wireless users.

For example, content enhancement players arose in order to bring one's desktop to a mobile device. Under the assumption that important, time-sensitive transactions would occur wirelessly, content delivery players

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promised low latency to users. Lastly, industry participants, such as content, network operators and access devices, that were "around" before the 3G hype, made sure that their web pages, networks, and devices would be able to capitalize on all that 3G technology had to offer.

Clearly, each of these players, or "parts" of the wireless value chain, could perform their functions and enhance value in a 2G world. But, 3G technology was viewed as the pot of gold at the end of the rainbow. When 3G came, wireless data usage was expected to explode, which would mean more revenue, cash flow and value to each of the players in the chain.

Thus, wireless data companies seemed to be springing out of the woodwork. Many private companies evolved, and had little trouble raising funds from venture capitalists eager to ride what many considered the next big wave. A large number of such companies went public in 1999 and 2000, and stock prices soared.

In the second half of 2000, though, the bubble burst. The NASDAQ declined as investors felt the tech boom, and the economy, slowing down. Public companies that needed to come back to the market were faced with the choice of selling equity at depressed levels, and diluting the equity of current shareholders, or running the risk of bankruptcy.

At the same time, investors learned that both the costs and the timelines of 3G technology were expected to exceed initial expectations. Additionally, the 2G wireless Internet products that had been developed primarily by the network operators were showing little traction. Many began to wonder if 3G was even necessary, and from the reaction of the stock prices, concluded that it was not necessary.

We, at Lehman Brothers, reduced our expectation of industry data subscribers in 2007, to 139 million from 164 million. This lower number reflected the delay on the part of carriers in deploying next-generation services, and the anticipated slower adoption rates in the United States.

We also dialed back our data revenue assumptions. When the Internet craze was at its peak in late 1999 and early 2000, it seemed plausible that wireless data service revenue could be garnered from a multitude of opportunities, namely advertising, portals, transaction, and access. Evidence at the time of our estimate changes led us to believe that if the portal and e-commerce business models were struggling in the wired Internet world, they were likely to have a hard time making headway in the wireless Internet domain. To reflect such difficulties, we lowered our expected data service revenue expectations through lower data ARPU assumptions.

We also increased our capex estimates for the carriers, due to the migration to new technologies. At that time, we, the investment community, received a greater level of clarity from the carriers on the costs associated with the various technology upgrades. As a result of this additional

information, we increased our estimate of data capex for carriers such as AT&T Wireless and Nextel.

This paper is attempts to clearly define the "parts" of the wireless value chain, and in which parts we see value. We then review a survey that we completed in September of 2000, in which industry participants and investors attributed a point value to the different parts of the value chain. Finally, we analyze the stock prices of the wireless data players over the last twelve months, as well as the private companies that have been forced to shut down because of the negative turn in investor sentiment toward this industry. What is evident from this analysis is that all of the "parts" of the value chain were affected. Thus, while most of the network operators of the world are not in danger of bankruptcy, like some of the other "parts" of the chain, their market caps have been hit during the bubble bursting period as well. However, when the market comes back for this industry, it might be wise to look at the "parts" that were ascribed the largest value as the first place to put money in this space.

Our conclusions discuss the larger question of this conference, entitled, "Will 3G Deliver Its Promise – Or Is It Just Hype?" In short, we believe that 3G will deliver and add value to the wireless value chain. However, 3G will not be rolled out tomorrow, and as investors prior to the 1G and 2G network rollout learned, patience is imperative. We also wonder about the price that pure-play wireless data companies will have to pay in order to get financing for their ventures. The market has been "burned" by such a phenomenon once, and is unlikely to pile a lot of money into this sector again in the near term.

2. DEFINING THE PARTS OF THE WIRELESS VALUE CHAIN AND WHERE WE FIND VALUE

As we began to dig into wireless data, we were surprised to find so many different players in the market, each doing something slightly different. We have attempted to simplify this complicated space by dividing the many players in the market into a number of broad categories. The categories of our wireless data value chain are listed below. We are cognizant that these definitions are fluid, and could well be regrouped in a different way. But in order to further the debate, we plunge forward with these groupings. Throughout the rest of this section, we will attempt to flesh out exactly what these different groups do, but most importantly, how the companies make money and where the value lies.

2.1 Content Providers

When we think about the content providers for the wireless Internet, our first impulse is to look to the most successful wireless Internet experience to date. This is Japan's NTT DoCoMo. Currently, over 50% of NTT DoCoMo's i-mode data traffic is generated from entertainment. Transactions account for over 20%, with database information and news accounting for just over 10% each.

As a starting point, it is reasonable to assume that entertainment will be a popular use for the wireless Internet in the US. This "entertainment" category would include players like mp3.com, or ipulse, among others. Mp3.com allows users to store files (of their favorite songs) on the web and download the songs over a high-speed Internet connection. Thus, the days of moving CDs from the house to the car will be over.

In the transaction category, we expect players like Fidelity, Charles Schwab, ticketmaster.com, ebay and others to be evident. With ebay, auction participants will be able to track their progress and up their bids, wherever they are. Likewise, investors can track their stocks, and buy or sell them as needed through their wireless device.

Database players include the likes of CityGuide.com, MapQuest.com, Zagat.com, and Yellowpages.com. Users can access this information wirelessly in the same way that it is accessed on the web. MapQuest and CityGuide are especially useful on a wireless device, as one can find directions, or locate a restaurant in a given area. Content can also come from corporate intranets, as mobile workers tap back into the office LAN or mainframe for mission critical data. We are bullish on the prospects of the enterprise enabling their fixed computer networks to travel with employees wherever they may go.

Finally, the news / information players include The Weather Channel, CNN.com, Reuters, and the list goes on. Similar to the database players, users will access these sites on their wireless device the same way that they do via their wireline service. Wireless just makes the content all the more accessible regardless of location.

Content providers, such as some of these listed above, offer their information free of charge on the wired Internet, making money by selling advertising banners. With the limited screen sizes today and for the foreseeable future for mobile Internet, we are not optimistic on advertising business models working on cell phones. We view some of these straight information polling services to have pretty weak bargaining power in terms of grabbing upside from the wireless Internet. Corporate applications or transactions stand a much better chance of getting paid for becoming wirelessly60

enabled.

2.2 Content Enhancement

When we look at the content enhancement players, we are met with content aggregators, wireless application service providers, location services, and voice-enabled services. This is where the wireless web begins to get complicated. It is difficult to put different companies in one category, as most span a broad range of categories.

The value in this category becomes a "chicken and egg" question. Are the services and content offered over the web so valuable that subscribers sign up with a carrier or WISP, simply to access specific applications or content? Or, do the subscribers sign up for mobile Internet service due to a carrier relationship, and realize after the fact that they really like a specific application? To analyze this, we look to the cable TV industry.

When cable TV was first introduced, some subscribers signed up. However, it wasn't until those subscribers promoted certain channels to others that the real surge in subscribers began. Teenagers were begging their parents for MTV, and other such channels. Should this analogy prove true in the wireless Internet world, the way to choose content enhancement stocks that will outperform is to try to select the MTV in this space. It is unclear whether the "MTV" will be location services, or a technology that brings your desktop to your device, or even a new product that we have yet to hear about.

One thing is clear, though. Even taking into account the high number of companies that have ceased operations in this space, we believe there is still far too much competition in this area for all to thrive. Excellent business plans, a first-mover advantage that is sustainable, and strong management teams are qualities that we would look for as winners in this space.

2.3 Content Delivery

Content delivery involves making the user experience such a positive one that the user becomes addicted to wireless data, and thus uses it even more. Examples of content delivery products include synchronization, optimization, and security technology, as well as gateways and routers. Wireless synchronization services allow all of your devices, including your desktop, to wirelessly sync together your calendar, contents, and documents. Optimization services speed the delivery of information to users. Security services ensure that the credit card used in m-commerce transactions will not be used for fraudulent purposes, and that enterprise firewalls are protected

when they wirelessly enable their employees. Gateways and routers bring the content to users in a mobile, device-friendly way.

We view this segment as spread across the value chain. Yes, some of the services are valuable and subscribers will pay for them. However, others, while valuable, will not command a lot of money per subscriber for the service.

2.4 Network Operators and Services

There are clearly a lot of different businesses contributing to the end user wireless data experience. Not surprisingly, each of the "parts" feels that they are the most value-added segment of the chain. In hearing debates among the wireless data players, the strongest arguments almost always come down to "who owns the customer?" While we do not 100% subscribe to the idea that the customer "owner" adds the most value, it is an interesting place to start this discussion.

Some of the wireless portal companies have relationships with customers that could rival the relationships of the carriers. We will have to wait and see if the AOLs and Yahoos! of the world will go head to head with the carriers. For now, they are "playing nice," by speaking of partnerships with carriers, and stating that they have no interest in operating a wireless network. In all reality, most will believe it when they see it.

In today's market, it is clear that the network voice operators own most of the customers. These companies include the Big Six; AT&T Wireless, Sprint PCS, Verizon Wireless, Nextel, VoiceStream, and Cingular Wireless. There may be, for example, fleet management "customers" who feel more loyal to the wireless ASP that developed their wireless application than they do to the wireless pipe that transmits the data. However, we would argue that the majority of customers have a stronger relationship with their voice carriers than they do with the emerging wireless data companies.

With more subscribers than any other segment of the chain, it is feasible to imagine that the network operators call the shots at this stage in the game. For example, content providers currently pay carriers for a prime real estate position on a subscriber's WAP menu. Additionally, it doesn't look like the content providers are playing hard to get, as each of the carriers has a large selection of web sites available to their subscribers.

As we look into the future, however, we must ask, "will this relationship/value remain?" Is the wireless carrier just a dumb pipe as many have purported? If we look to the wired Internet, we would have to say "yes." The pipe in the wired world simply transmitted the bits, and did not garner much of the enormous upside that came out of the Internet. We would argue, however, that due to exactly that (the pipe not receiving any of

the upside), the wireless carriers are more determined than ever to participate in the upside of the wireless Internet.

The question then becomes, "how do service providers continue to add value, and not let the mobile Internet become a commodity (due to price competition)?" In all reality, the pricing plans currently in place for wireless data are likely only the first offerings in a vast string of constantly changing offerings. Questions that remain are how will they change? And which ones will be successful?

We believe that in the United States, an unlimited, all-you-can-eat plan is essential. Unlike most other countries, in which the majority of Internet users' first Internet experience will be on a mobile device, most in the United States have already experienced the wired Internet. These American Internet users are accustomed to all-you-can-eat service, making it imperative for the mobile operators to offer it, in order to get deep penetration in the population.

A second characteristic of a valuable wireless Internet service offering will be one that differentiates itself from its competitors. While there are many content aggregators in the market today, we would wonder what would happen if all of the carriers chose similar aggregators. A subscriber in this scenario would not choose a carrier based on the wireless Internet product, as they would all be the same.

Also, in the mobile Internet world, there are other pipes that are not present in the voice world, and other customer interfaces, like Wireless Portals. We have presented the players in these segments above. These "other" pipes include players like GoAmerica. This camp also included companies such as Motient, and OmniSky, which have both filed for Chapter 11 in the past five months. Unlike the voice operators, these players do not add value by having a relationship with a vast amount of customers.

Instead, the "other" pipes attempt to offer value through unique features that are not available in the voice world. For example, GoAmerica offers wireless Internet access through a personal digital assistant (PDA), such as the Palm, and through a variety of other devices. The concern with this group is that the voice operators will eventually offer customers different devices, and the competitive advantage (and thus value) of this group would be eliminated.

A virtual private network (or VPN) uses the existing wireless service providers, data operators, and WISPs to transmit bits across the air. In discussions with management of different VPN companies, we were told that wireless emails are sometimes never delivered. The emails have a "lifetime" and will die if they do not reach the destination within that lifetime (due to a crowded network).

Because VPNs have dedicated lines running from the wireless providers to their network operations center (NOC), VPNs can guarantee message delivery and a low latency on messages and data. These VPNs will be useful for time-critical information. For example, wireless on-line trading companies believe that they can often generate a trade (and thus revenue) by getting information about stocks to their clients quickly. Likewise, doctors cannot afford to not get messages in a timely manner. The VPNs that we have spoken to indicate a three to five minute latency in messages. We expect subscribers to pay about $70 per month for this service.

2.5 Access Devices

One truism of the wireless Internet is that it will require users to own a terminal. Beyond that self-evident statement lie few certainties. A range of platforms are competing to establish themselves as the platform of choice for mobile data. The handset vendors are including improved navigation and text-handling features in their phones. Wireless modem manufacturers are turning the laptop computer into a truly mobile access device. Personal digital assistant vendors, such as Palm and Handspring, are building wireless functionality into their units. Computer manufacturers, such as Compaq and Hewlett-Packard, have developed handheld devices under the Pocket PC umbrella. While we believe that competition in this market will be intense, we recognize that the range of applications available for the wireless Internet will likely require a variety of access devices.

3. THE VOTE – WHERE INVESTORS SEE VALUE, AND WHERE THE INDUSTRY SEES VALUE IN THE WIRELESS CHAIN

In September of 2000, Lehman Brothers held a two-day Wireless Internet Conference. The conference drew more than 400 attendees and a number of speakers from the wireless Internet services and equipment worlds. One of the most interesting sessions of the conference was a panel that discussed the value chain.

We asked buy-side investors and panelists (including a content provider, content aggregator, carrier, and vendor) to place an NPV on the different parts of the wireless value chain, in which the sum of these NPVs (for the different links) had to be 100. Our results were quite interesting. The carriers scored highest, according to both investors (who gave them 38) and

panelists (at 37). Panelists and investors emphasized that this high value reflects the fact that carriers are controlling the real estate.

As for the rest of the categories, investors thought that content providers were worth more (with an average NPV of 22), as shown in Table 1 below, while the panelists attributed only 9 points of NPV, as shown in Table 2. Our content provider on the panel (Zagat.com) stated that, while content is important to users, the lower value attributed to content (from the panelists) reflected the state of negotiations at that time. However, as investors also represent users of wireless data (who value content), the power in these negotiations with carriers could shift over time. Also interesting was that adding location to advertising could increase CPM (or cost per thousand eyeballs) to $250 from $30, per Zagat.com. Location was given 3 NPV points by investors and 6 NPV points by panelists.

Table 1. Investor Results

	Investor 1	Investor 2	Investor 3	Investor 4	**Average**
Content Provider	30	35	3	20	**22**
Content Aggregator	5	1	1	10	**4**
Location Services	5	5	1	2	**3**
ASP	10	5	3	2	**5**
Reseller	0	1	2	4	**2**
Wireless Carrier	30	30	70	20	**38**
Equipment Vendor	5	15	20	30	**18**
Capital Providers	5	8	Implied	10	**8**
Other	10	0	0	2	**3**

Table 2. Panelist Results

	Panelist 1	Panelist 2	Panelist 3	Panelist 4	Panelist 5	**Average**
Content Provider	10	5	5	10	15	**9**
Content Aggregator	10	2	15	5	10	**8**
Location Services	10	5	10	5	0	**6**
ASP	40	10	10	5	10	**15**
Reseller	5	3	7	5	5	**5**
Wireless Carrier	15	50	40	45	35	**37**
Equipment	3	15	3	5	20	**9**
Capital Providers	5	10	10	20	5	**10**
Other	2	0	0	0	0	**0**

4. FORGET WHAT THEY THINK – WHAT DO INVESTORS' ACTIONS TELL US?

While it is certainly interesting to hear from investors about where they think the value lies in the wireless value chain, the real sign of what investors think is evident in where they place, or do not place, their money. It is quite clear from this metric that investors are not excited about wireless at present, regardless of the link in the value chain at which they are looking. Market caps of wireless data companies have plummeted in the last year, with many of these stocks hovering on the brink of bankruptcy. As for the carriers, the stock prices have seen better days, but are not approaching the near-bankruptcy trading levels of their wireless data cousins.

In hindsight, many of these companies came public too early, and did not have a fully funded business plan. Thus, when the market turned south and investors no longer wanted riskier wireless Internet names in their portfolios, the newly public companies were left with nowhere to go. This lack of funds exacerbated the problem as investors began to nibble at telecom again, but only fully funded business plans.

Below, we list a handful of companies that defined the wireless Internet space a year ago. We also list the stock prices that the companies traded at on September 1st of 2000, and the trading prices today. If we were to assume that such stock prices are indicative of investor perception of the space (which is not a far-fetched assumption), investor perception of the wireless

Internet space was quite high a year and a half ago, but has since fallen drastically.

Several of these companies, Metricom, OmniSky, and US Wireless Corp, have already declared bankruptcy and liquidated their assets. Data Critical Corp. merged with Ether Merger Corp, a wholly-owned subsidiary of General Electric. Thus, of 15 public companies that were known to lead the wireless Internet space, three are bankrupt, and one (Data Critical) was close to bankrupt before merging with another entity. Furthermore, those that are still "alive," have seen valuations fall from 78% to 98% in the last year and a half.

Table 3. Stock Performance of Wireless Internet Leaders

	9/1/00		4/26/01	
MCOM	$41.50		Chapter 11	
OMNY	$12.00	*	Chapter 11	
DCCA	$8.78		Not trading	
RIMM	$81.00		$18.09	-78%
SWIR	$67.56		$9.44	-86%
USWC	$13.69		Chapter 11	
AETH	$144.50		$3.65	-97%
OPWV	$97.50		$5.89	-94%
AVGO	$12.00	**	$1.00	-92%
DLK	$15.25		$0.57	-96%
GOAM	$11.19		$0.80	-93%
INSP	$40.19		$1.26	-97%
IIIM	$8.75		$1.07	-88%
SVNX	$46.63		$1.00	-98%
PUMA	$24.72		$1.01	-96%

We also look at 52 private companies in the wireless Internet realm and have found that 27% of these companies have gone out of business since September of 2000. Again, these were companies that, a year ago, we at Lehman Brothers believed had a lot of potential. Of the companies that have survived thus far, many have had to access the private market since September of 2000, and have been forced to accept a down valuation from their prior round of financing. While such a thing was unthinkable a year or two ago, these companies are considered quite lucky by many to have received financing from this market, period.

Lastly, other companies have bought a number of the private companies on our list. These include Airflash (which merged with Webraska), Cellnet

Data Systems (which was bought by Schlumberger), Cerulean Technology (which was bought by Aether Systems), HighwayOne (which was bought by Zipcom), Spotcast (which was bought by Leap Wireless), Tegic (which was bought by AOL), and XYPoint (which was bought by Telecommunication Systems). It is not always clear what was paid for these small, private companies. However, we feel we can safely deduce that many of these companies needed another round of financing, and were having trouble getting the cash. Hence, we believe it was lack of positive perception from investors that led to these companies being acquired by other companies.

Table 4. Private Wireless Internet Companies that Were Leaders in Sept 2000

	In Business	Out of Business
ADC Mobile Systems		x
Aeris Communications	x	
Airbiquity	x	
Airflash	Merged with Webraska	
Aolmobile		x
Bismark International	x	
Celemetry		x
CellNet Data Systems	Bought by Schlumberger	
Celltalk Business Centre		x
Cerulean Technology	Bought by Aether	
Clickadeal.com		x
Digital Mobility Limited	x	
Formus Communications		x
FusionOne	x	
Gemplus	x	
HighwayOne	Bought by Zipcom	
Lava2140	x	
Livemind		x
Lynkus		x
MDSI Mobile Data Solutions	x	
MobileSys	x	
Mobility Networks	x	
NeoPoint	x	
NewCom Technologies		x
Notifact	x	
Oraclemobile	x	
Peramon	x	
Proton World	x	
Proxinet		x
Satama Interactive	x	
Sendo	x	
SiRF	x	
SmartServ Online	x	
Snaz		x
Sonera SmartTrust	x	
Spotcast	Bought by Leap	
Starfish	x	
Stock Smart	x	
Symbian	x	
Tegic Communications	Bought by AOL	
Tele2	x	
Telia Panama		x
Tellus Technology	x	
Third Rail Wireless Services	x	
True Position	x	
Wireless Data Services	x	
Wireless Knowledge	x	
Wireless Services Corp		x
WirelessDirect.com	x	
WorldWide Wireless Networks	x	
W-technologies		x
XYPOINT Corporation	Bought by Telecommunication Systems	

Thus, while the wireless sector has suffered from a number of high-profile delays in deployment timelines, we believe overzealous initial expectations are now adjusting to a more sanguine view of timelines for the rollout of data-enabled networks, which is evident in recent stock price performance. Furthermore, in our opinion, the underlying business case for the migration to next-generation networks remains intact. The timing of some of the upgrades is still uncertain, however, given network complexity, difficulty establishing service levels, handset constraints, and high costs. Still, we believe that several factors are driving wireless carriers to deploy new data services. Some of these factors include increasing voice traffic straining the capacity of current networks, and the potential for data services to boost average revenue per user, or ARPU.

Voice traffic in wireless networks around the world continues to grow rapidly, driven by both an increasing subscriber base, and higher usage among existing subscribers. Carriers have traditionally increased capacity by using more spectrum and splitting cell sites by adding additional base stations. Both of these practices, however, have challenges of scale. Spectrum, of course, is finite.

Cell splitting, as it adds complexity to network management, also becomes economically impractical at certain levels. Finding new sites for the cell towers is also increasingly difficult, as it can require up to 12 months of effort to negotiate zoning regulations. Migrating to next-generation networks should help ease the burden on the network of increased traffic.

We note that technology choices have very different implications for carrier capacity. CDMA2000 1x, which is currently available, aims to offer CDMA carriers nearly double the voice capacity of their current cdmaOne, or 2G CDMA, networks. We note that cdmaOne networks offer approximately 10 times the voice capacity of analog networks, according to the CDMA Development Group. CDMA2000 1x, then, has approximately 20 times the voice capacity of analog networks. The migration to GPRS should also expand voice capacity. The GSM camp of carriers expects AMR (adaptive multi-rate vocoders) to almost double existing voice-capacity as well.

We note that leading equipment vendors such as Nokia and emerging startups such as Mobility Networks (formerly mDiversity) are actively developing means to increase the voice capacity of 2G GSM networks without requiring installations of new base stations. The upgrade to EDGE will allow operators to increase their voice capacity using existing spectrum. W-CDMA networks may offer as much as 20 times as much voice capacity as analog networks.

We consider the issue of voice capacity critical because voice service currently remains the key revenue driver for the wireless carriers. Voice capacity is a constraining factor for carriers in their marketing and pricing plans. Ultimately, capacity drives the marketing strategies of major carriers and thus revenue streams—a condition we expect to continue for years to come. While bringing data products to market faster than the competition may temporarily shift market dynamics, in the long term, the carrier with the most voice subscribers may realize the greatest number of data subscribers, as they can sell to the largest subscriber base.

Another reason to upgrade the network is the potential to increase ARPU. Operators are always looking for ways to enhance their ARPU. Wireline operators have seen tremendous pricing pressure on pure voice services over the past decade. In the U.S., the major carriers have continually boosted the size of the minute plans they offer consumers. We believe that, ultimately, wireless voice pricing is likely to mirror the slow, steady decline seen by wireline operators over the past several years.

Wireless operators are looking to provide additional services to their subscriber base, beyond pure voice service. In order to provide these value-added, ARPU-raising services, such as messaging and high-speed Internet access, carriers must improve the data rates their networks can offer the handsets and other devices. Current 2G networks require a long connection time—much like a dial-up modem at home—and offer meager data rates of approximately 10 to 19 kbps. New 2.5G (GPRS and IS-95B) and 3G (CDMA2000 and W-CDMA) network technologies will offer 'always on' connectivity and high-speed data rates.

Thus, we expect to see carriers continue to aggressively deploy data services. Many are already well down this road. Revenues from SMS services comprise, on average, approximately 11% to 12% of sales of European wireless operators. For example, SMS generated 11% of Sonera's sales in 2000 and the percentage increased to 12% in 2001.

We believe that the next generation of the WAP standard, which will add support for HTML documents, is likely to facilitate the adoption of data applications. We also think that the convergence of the WAP and i-mode (or c-HTML) standards into a unifying XHTML standard may act as a significant growth catalyst for new wireless applications. We furthermore think the roll out of new wireless applications with the launch of 1XRTT and GPRS networks will enhance the uptake of wireless data across the subscriber bases.

Thus, the business case for 3G seems clear. But such a scenario is not enough to ensure that the networks will be built. The capital markets are currently averse to financing such ventures. Thus, the question of who will

finance this project remains dubious. Even more interesting is, once the carriers and pure play wireless data players do find someone to finance their ventures, at what price will such financing be done?

The market today is steering clear of pure-play wireless data companies. Many are trading below their cash value per share, which is a fairly obvious indication by investors that they do not have a lot of confidence in the future of those companies. Additionally, while a large percentage of pure-play wireless data companies have ceased operations, we do not think this is the end. There still exist several wireless data companies, both public and private, that had hoped to complete another round of financing by this point in time. These companies are attempting to rein in costs, in order to stretch their current funds to a point in time when the market would have warmed up to their stocks. Given that these companies should be in hyper-growth mode, this reining in of costs is quite counter-intuitive. We believe that for many companies, the wireless data story is not likely to come back in favor with the market in time for these companies to get the funds to survive.

The positive side of this scenario is that those that survive will be left with a market that has far less competition than that of the market before the bubble burst. These companies should be able to capitalize on this opportunity in the near-term. Should the wireless Internet prove to be the boom that many had hoped it would be, there no doubt will be new companies entering the space. But, in the nearer term, there will likely be a window where the survivors from the first wave (that crashed) will be in a market with few competitors.

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