



Near Earth's investment thesis for today's market

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Capital markets seem to be caught in a state of partial paralysis. This is not a "paralysis through analysis" as we used to say at MIT when one over analyzes a situation or is overwhelmed with conflicting data. This is a paralysis driven largely by the absence of good sound decisions to make after completing good sound analyses. Many investors and corporations are unsure as to whether we are experiencing a slow but volatile recovery out of a deep recession, on the precipice of a second and potentially deep dip into another recession or simply likely to bop along with pitifully low growth and high unemployment for a decade or so. None of these outcomes is particularly attractive and which view one adopts says almost more about one's personality than any reasoned evaluation of economic data and trends. In short, no one really has a clue as to what will happen to the global or even local economy over the next 5 to 10 years. The only clear fact is there is a great deal of justified anxiety and no easy solutions.

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So in this period of fewer good mainstream investment options (i.e. stock market, real estate, bonds, Treasuries), no clear visibility and a general expectation that the economy could be bad or at least flat for an extended period, what is an investor to do? You can certainly stick a healthy proportion of your net worth in the relatively safer, more liquid and less volatile large cap value stocks, but if the goal is to reach for capital appreciation some amount of one's net worth may be better allocated to higher risk, higher return options. We think the answer for this part of one's portfolio is similar to the advice often given to graduating students who are faced with a difficult employment market. Go back to school, make yourself more valuable by investing in your education and then look to monetize that value in a better future market environment. For investors, we think this analogy means placing a larger share of net worth into private alternative investments like private equity funds and venture capital funds where the exits can be delayed until better market conditions return. The analogy works particularly well for venture capital, where one is basically investing in knowledge creation (i.e. technology) and hard working, motivated entrepreneurs and trying to position companies for attractive exits in a few years at hopefully higher valuations.



We also believe the timing for venture capital is quite good because private market valuations are still reasonable as we are not that far from the trough of the last bubble. All else being equal, would you want your money in a 2006/2007 vintage venture fund or a 2010/2011 vintage fund? The amount of capital flowing into venture funds is also down considerably from recent peaks while an explosion of innovation continues. In short, less supply of capital, but plenty of demand for it means more investment options.

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But, isn't it better to be in more liquid investments in times of high uncertainty like today? We would argue NO, not if you are paying too much for that liquidity. The liquidity premiums investors are paying to be in public securities or funds may now be too high versus the value of that liquidity. In explanation, we would argue that an investor desires liquidity for two primary reasons: (1) to have the ability to switch to a more attractive investment opportunity with superior risk/reward characteristics and (2) to go to the safety of cash. As to the first reason, the value of liquidity to investors should be a function of the likelihood of more desirable investments becoming available within the investment horizon of the non-liquid alternatives. If public market volatility over the investment horizon is more likely to be volatility around a flat or downward trend line, then there should be fewer superior investments requiring liquidity in order to reallocate capital. There will of course always be some superior investment opportunities requiring liquidity for capital reallocation, but our argument is there is likely to be fewer such opportunities and therefore the liquidity premium should be lower than if the volatility was around an upwardly biased trend line, as has been true for most of history and much of the recent past (both the boom and the bounce back).

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As to the second reason for desiring liquidity, the ability to move to the sidelines and sit on cash is of less value to investors if the interest rates being paid on cash and cash equivalents are as historically low as they are now. We would even argue these rates may not truly compensate investors for the risks of inflation. The rates are more of a blended average of the risks of deflation and inflation, and if the government is determined to fight deflation as the worse of the two evils, the primary risk to consider when sitting on cash is inflation. Is a 0.6% 2-year Treasury rate adequate?

Lastly, we would argue that the liquidity an investor believes he is paying for is often illusory. Many hedge fund investors found this out in the last market downturn. If the desire for hedge fund liquidity



is individual, the liquidity has far greater value than if the desire for liquidity is widespread as during a market melt down. If everyone is rushing for the exits at the same time, you will pay a steep price for that liquidity. In this market, we would argue, the reason to invest in a hedge fund is largely to get positive alpha, not because the fund offers liquidity. We would also argue that the value of liquidity is also diminished to a considerable extent for traditional public market investors. For public market investors seeking liquidity to switch from one liquid investment to another, the increasing correlation of public securities driven by globalization and the increasing market share of ETFs and index funds makes it less likely there will be as many investment alternatives moving in an uncorrelated direction as the investment being sold. Again, there will always be alternative investments available, but if there are fewer such alternatives then the liquidity premium should be less valuable as those fewer uncorrelated investment opportunities will be bid up to higher valuations.

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Hopefully, the above views will lead you to reconsider the relative value of liquidity in this market environment and open your mind to a greater allocation to private investments, particularly venture capital which focuses on technology driven growth which can be incubated even in poor economic times.

Of course, like staying in college to get that advanced degree, it does critically matter where one focuses one's studies (e.g. technology versus art history) and then diligently positioning oneself to be attractive to those firms likely to be hiring in the future. The student also has to apply him or herself and get good grades versus hanging out at the beach. Likewise, a fund manager must be either great at "stock picking" or choose to focus in the "right" sectors where the probability of success is inherently higher. A combination of both is the best strategy and our view at Near Earth. First, we would choose to invest in those sectors that are experiencing long-term secular growth and growth that is largely uncorrelated with the general economy. Luckily, many of the sectors we have covered for years have these exact characteristics.

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Here is an example of what we mean by "long-term secular growth largely uncorrelated with the general economy". If you grew up in the 1960's you could track the number of burgers McDonald's sold on its signs. Every time they sold another million burgers the signs would change and people would look in amazement. With

countless billions and billions of burgers sold, McDonald's has long sense bothered to count them. If you were to have purchased shares of McDonald's at the beginning of 1970 your split adjusted stock price would have been roughly \$0.30 versus today's stock price of roughly \$70.00. That represents an average return of over 14% for a period of 40 years. That is a long-term secular trend largely uncorrelated with the general economy. In some periods, McDonald's even did better in recessionary periods as people shifted to lower cost food options. Basically something, in this case franchised fast food, was introduced into the economy and forever changed our way of life. A patient investor only needed to consider whether or not future generations would consume more or less franchised fast food and if other people in other countries might one day also want this service. Corporate management continued to matter in the medium term, but where the Dow happened to be trading was, in hindsight, largely irrelevant over moderate time periods. What really mattered was a key innovation that fit perfectly with changing market demand. In the case of McDonalds, it was consistent menu, food quality and even store appearance offered to increasingly time pressed two-earner households and a more mobile populace.

Finding companies that are likewise positioned for long-term secular growth and then looking to back the best management teams is the strategy we think will generate superior returns in today's environment. Investment timing, however, is also important. McDonald's growth was slow at first, but then a tipping point was reached as network effects increased the demand for franchises. The presence of a near term tipping point or inflexion point in the growth curve is therefore also important in the timing of any private investment. Good investment opportunities will be ones where a well defined tipping point was recently passed or can be seen on the immediate horizon.

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So how does this apply to the industries we cover: commercial satellite, wireless telecom and aerospace? Within each of these industries are sectors we believe demonstrate a potential for long-term uncorrelated secular growth with a near term tipping point. Here are a few examples:

- **Satellite Broadband:** It is often said that broadband access is no longer a luxury, it is a necessity. Clearly, it is difficult for satellites to compete with terrestrial alternatives where they are offered. It is also true that many millions of sufficiently affluent



households and small businesses reside outside of regions where terrestrial broadband alternatives are available or likely to be available for decades. The geographic area suitable for satellite broadband may decrease over time as terrestrial alternatives expand their coverage areas, but this decrease in territory may very well be compensated for by increasing population, increasing affluence and/or increasing average bandwidth consumption. In any event, are there many people who would bet against long-term global rural broadband penetration going up dramatically in the next decades? By dramatically, we mean by a factor of 10x or 100x. In Africa, people have been talking for years about the 100%+ annual growth in cellular traffic, but only recently have people started to focus on the 1,000%+ growth in broadband traffic, growth that would be even higher if it were not being constrained by network bottlenecks.

The question then becomes, how will this rural broadband demand be economically satisfied for both user and provider. The answer and the tipping point from our point of view is the emergence of High Throughput Satellites (HTS) like ViaSat-1. These mostly Ka-band spot beam satellites provide 10x or more of the bandwidth of traditional GEO satellites enabling higher bandwidth availability for satellite users and comparable monthly service charges versus terrestrial alternatives. There are also no technical barriers to expanding 10x satellite capacity to 100x. Another tipping point is the increasing commercial availability of lower cost and easy to self deploy customer premise equipment (CPE). What we see evolving is a slow but accelerating proliferation of HTSs and low cost CPE with global subscriber counts going from hundreds of thousands to tens of millions. Still a drop in the bucket versus the billions of eventual terrestrial broadband users, but a very attractive investment opportunity nonetheless for the entire value chain supporting the millions of satellite broadband consumers we see on the horizon.

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- **Mobile Broadband & Cellular Backhaul:** There are currently over 3 billion cell phones in use globally and according to a recent Pew Survey roughly one third of U.S. adults now use mobile broadband. As smart phones get ever smarter, cheaper and more numerous and as 3G networks evolve to 4G, LTE and WIMAX, mobile broadband will become ubiquitous and commonplace. The only question is the compound average

growth rate over the next several decades, not whether or not there will be substantial growth. Does anyone seriously doubt this projection? Even in the deepest part of the recession sales of new iPhones skyrocketed. This mobile broadband future does, however, assume we find enough wireless spectrum to handle the increased traffic and solve the all important middle mile problem. The first mile is simply a fiber link from an aggregating node to the Internet or PSTN. Adding fiber capacity at existing nodes is relatively easy and cost effective. The last mile is from the tower to the cell phone and can be solved with more spectrum on current cell towers or, if necessary, more towers. The government seeking to find or reallocate 500 MHz of spectrum for wireless broadband may solve the spectrum part of the looming capacity problem in the U.S. and is one of the tipping points to monitor.

The trick is the high bandwidth link from the towers to the aggregating nodes: the: "middle mile". Historically, this traffic has been carried by T-1 lines over copper, and today in many cases, fiber transport networks accomplish this connectivity. However, copper has limited capacity and it is not always economical to lay fiber – meaning that it is these over the air middle mile links that can create the worse bottlenecks and contribute the highest costs to broadband connectivity. With ARPU growth likely to face resistance, the cost of the middle mile has to be brought down. Currently, the over the air links are accomplished largely through microwave systems. These microwave links typically provide 100s of Megabytes per second of connectivity. Newer and higher frequency millimeter systems now offer 1 Gigabyte per second connectivity. That capacity appears to be fine for now, but most telecom carriers are predicting capacity bottlenecks within a few years and are looking for technologies that can provide 10 Gigabytes per second. To reach those levels may require a new generation of millimeter wave systems or laser based systems called free space optics. Free space optics to date has not demonstrated the reliability in all weather conditions or range required to be effective for most applications. If a company can overcome those obstacles, it will find a large and open market. Technologies employing super fast laser pulsing are showing promise. This is another tipping point to monitor.

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- **Unmanned Aerial Vehicles (UAVs)**: At the National Space Symposium a few years ago, I heard a top Air Force General



declare that the U.S. had probably just agreed to procure its last manned fighter plane. Now we may be buying copies of existing models of those fighters for decades to come, but the point was that the future was in unmanned aerial vehicles like the Predator, Global Hawk and dozens of other designs of all shapes and sizes currently being fielded or tested. I used to think the primary reasons for using UAVs were lower cost and avoidance of risk to pilots. Turns out that's only part of the picture. The primary motivation is performance. For many missions, UAVs simply get the job done better than manned systems. This is in part due to a UAV's ability to combine the reconnaissance or surveillance mission with the strike mission. Air dropping a special forces team into a hostile area to call in an air strike can now be accomplished with a UAV firing a missile after a guy in a trailer watches a satellite linked video feed. But while this capability seems easy to field, in practice there are hundreds of soldiers and specialists in the chain of operations for mission planning, training, flight preparation, flight operations, maintenance and logistics, and communications. It is not cheap or easy.

What will make UAVs really take off and be fielded in truly large scale numbers are a whole series of innovations currently being pursued by entrepreneurs and aerospace companies. These innovations involve, to name a few, more survivable and lighter airframes, greater maneuverability, greater autonomy, quieter engines, engines with more power per pound of mass, autonomous landing in any environment with or without GPS, in-air refueling, and higher quality and higher bandwidth communication links. Much work is also being done to create smaller, portable and deployable systems that still retain much of the performance capabilities of the larger systems.

We believe the investment opportunity is two fold. First, seek to back those component and subsystem companies with category winning and game changing technologies likely to be adopted across multiple UAV platforms. Second, focus on companies that can market components or UAV systems suitable and affordable by non-military customers, such as Federal, State and Municipal agencies and corporations. Applications are numerous, including enhanced border patrol, police and FBI applications, traffic and news reporting, aerial photography, monitoring pipelines and utility corridors, and FEMA applications. Manufacturing scale is the key here, so the tipping

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point will be the military settling on one or two small systems and ordering thousands of them.

- **Commercial Space:** NASA's new space policy calls for billions of dollars to be invested over the next several years in developing the commercial space industry. While the magnitude of this activity may get reduced by Congressional action, some significant financial support is still likely to be approved. In many cases, companies receiving NASA financial support will have to first prove their worth through contractual studies or in sponsored competitions with other contenders. The best management teams and best technical solutions that come out of this process are likely to attract the lion's share of NASA financial support. As part of this process, NASA will also be providing, directly or indirectly, valuable due diligence guidance for prospective investors as it uses its own considerable expertise to vet the companies, technologies and management teams. It is as if prospective investors are able to hire the leading industry consultant onto their due diligence teams for no compensation. Even better, NASA is also likely to be the first and largest customer for these companies and contribute to the funding of these companies in a manner that reduces the investors' risks while enhancing expected returns on investment. NASA is willing to do all of this because otherwise these companies might never attract sufficient private capital and NASA would have to spend far larger amounts to achieve the same desired capabilities.

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The perfect example of this commercialization support process is SpaceX, which competed against five other companies for one of two Commercial Orbital Transportation Services (COTS) awards. Through these awards, NASA "invested" significant funds into SpaceX without burdening the company with debt or diluting the founder and subsequent private equity investors. As part of COTS, NASA has also entered into contracts with SpaceX for launches to deliver cargo to the International Space Station. These funds and backlog have been instrumental in allowing SpaceX to raise private capital to complete the first successful launch of its Falcon 9 rocket and this success has in turn allowed SpaceX to attract additional backlog from commercial customers. If SpaceX can make further progress on its Falcon 9 development program and get closer to commercial operation, it will be well positioned to go public or raise additional private capital on attractive terms, thus freeing NASA

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from the need to provide any further financial support. The tipping point in this case was clearly the COTS award. If you could have invested in SpaceX contingent upon them winning one of the two COTS awards, you would have made a good risk/reward investment. If the NASA commercialization policy continues as currently envisioned, there may be many more attractive investment opportunities like SpaceX and these opportunities will have to do with rockets, satellites, cargo and even humans going up and down, not the stock market.

- Other Sectors:
 - **Machine to Machine (M2M) Communications:** Cost of embedded chips declining toward a tipping point. Wireless networks expanding coverage and capabilities. Iridium, Globalstar and Orbcomm have secured financings for their next generation fleets.
 - **Geospatial:** GPS becoming ubiquitous. Location based services exploding. Navigation becoming standard application for phones and automotive vehicles. Information being geo-tagged (digital photos, Tweets). Web-based free global imagery databases. Enabling this growth has been free GPS signals and a government anchor tenant that covers and de-risks the capital employed for the space imagery infrastructure. The tipping point is cheap processing power and powerful software tools, often in the “cloud”, that can turn a mash of geospatial linked data sets into user friendly and actionable information. Every new set of geo-linked content, whether professionally create or user created, adds to the growing network effect.
 - **Non-Industrial Robotics:** Most robots today automate manufacturing, serve some menial consumer function like cleaning or are for purely entertainment purposes. Advancing technology will allow a new generation of robots to perform a broader range of valuable services on an economical basis. Some of these advances are being driven by military and police applications while others are flowing out of labs focused on operating in harsh environments like space, the deep-ocean or areas of extreme heat. The intelligence, mobility and survivability of these new robots will eventually reach a level where they can be applied to more mass market government, corporate and consumer applications.

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if you have any
advice for us as
we move forward,
we welcome your
input ...

These are some of the sectors we have spent years, and in some cases decades, covering, learning and analyzing. We believe they each show long-term secular growth potential largely uncorrelated with the general economy and have recently or will soon reach important tipping points. They are also sectors in which we have developed significant relationships with companies and entrepreneurs and see a high degree of potential deal flow. In many cases, however, the opportunities lie somewhere between the friends and family or angel stage and a typical first VC round. This means initial investment sizes often in the \$1 - \$5 million range, which is a good sweet spot for a smaller first venture fund. We believe there are many “diamonds in the rough” that get orphaned at this stage. In other cases, the deal flow we see represents later stage growth companies still too small for the private equity firms or not yet easily leverageable, and in industries not well covered by the VC industry (e.g. satellite equipment/services and aerospace). There are also special opportunities that crop up from time to time that are attractive, but hard to categorize. Some of these may be co-investment opportunities on private equity buy-outs, distressed debt or VC investments. Others may relate to secondary sales from existing funds or undervalued PIPE transactions.

Taken together, we believe the sectors we cover represent a unique investment opportunity for a new fund, and perhaps especially in these challenging market conditions. We also recognize that success is not just a matter of being in the right sectors, but largely dependent on screening numerous opportunities for the best technologies and management teams, negotiating and structuring favorable deals and combining the fund’s investments with reasonable exit flexibility and enough staying power to support the companies to cash flow breakeven or further funding events. This is the investment strategy we think makes sense for this market and we have spent decades developing just the kinds of due diligence, valuation and structuring skills required while serving some of the top corporations, private equity funds and hedge funds in our industries.

We feel strongly enough in this investment thesis to be launching our own venture fund and are taking the first steps to make that a reality. We also feel strongly that our team’s blend of academic training (technical and finance), corporate experience (engineering and management), and financial expertise (investment banking and equity research) provide unique insight into recognizing both value



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and risk. We will not be soliciting funds for some time, but if you have any advice for us as we move forward, we welcome your input.

By Hoyt Davidson
Near Earth LLC



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