



April 20, 2015

Dear Limited Partners,

We are very fortunate to have had a strong start for the year. In a period where the overall markets were relatively flat, Greenhaven Road was up more than 8% for the first quarter net of all fees and expenses. Given the strong 2013 (+64%) and 2014 (+23%) performance, I suspect you are starting to look forward to opening your statements. Despite nine straight quarters of positive performance, we have by no means figured out a way to smooth out volatility or eliminate losses. The fund is being managed for absolute returns over a long time horizon (five-plus years) and we accept that volatility will come with that. We will have down months, quarters, and years. That is an unavoidable truth. The steady climb upward has been a combination of skill, luck, and environment – not a new strategy that deploys indecipherable derivative strategies or rapid trading. We have not eliminated losses, rather, the individual businesses that we own have continued to grow and the market has come to appreciate them more as reflected in their multiple expansion. Please think about your returns over multiple years, not a quarter or a year. With that said, we are certainly pleased with our results this quarter.

SMALL IS STILL BEAUTIFUL

In my last letter, I tried to make the case for why little Greenhaven Road can continue to achieve results that are equal to or better than other funds with far larger resources. I even invoked my favorite Warren Buffett quote, “Anyone who says size doesn’t hurt investment performance is selling....It is a huge structural advantage not to have a lot of money.” The fact is, because we are a small fund, we can invest in small and even micro capitalization companies – we simply have fewer constraints. Think about it: If you run a \$3B fund, a 2% position is \$60M. Are you going to spend a lot of time looking at a \$200M company even if it has no analyst coverage and a compelling valuation? The fact is microcap land is exactly where Buffett invested in the 1950s and ’60s when he was running his Buffett partnership – his highest return years as an investor. I read a lot, to the point where my wife has accused me of not talking. I assure you this is not true, I just don’t talk a lot. In all of my reading, the only place I have seen an analysis of just how small the companies were that Warren Buffett invested in his early days was done by a microcap manager Tim Eriksen of Cedar Creek Partners. According to Tim’s figures, which are most likely spot on, the Oracle of Omaha was not afraid to invest in the tiniest of companies in his early days.



For example, at the time he invested in Union Street Railway, the market capitalization of the entire company was less than \$600,000. After adjusting for inflation, \$600,000 equates to a market capitalization of less than \$6M in 2015 dollars. As the chart below indicates, Union Street was the smallest market capitalization, but was by no means his only microcap investment.

Buffett Investment	Year	Market Capitalization	Approximate Value in 2015 Dollars
Union Street Rail	1955	\$600K	\$5M
National American Fire	1957	\$2M	\$18M
Sanborn Map	1958	\$4.7M	\$40M
See's Candy	1971	\$35M	\$210M
Blue Chip Stamp	1968	\$8.5M	\$65M
Berkshire Hathaway	1962	\$12.8M	\$110M

These investments were not successful because they were small companies, but clearly Buffett was willing to go into the smallest crevices of inefficiencies. At times it feels lonely swimming in the waters we often occupy – but you can take some solace in that Warren Buffett was doing the same when he was running a small pool of money. I don't think it is a coincidence that he also had his greatest returns in this period. Being small allows us to look for the Sanborn Maps and See's Candy of today. The beauty of being small with a broad investing mandate is that we can also invest in larger companies when the opportunities arise there as well. We simply have fewer constraints.

My last attempt to convince you that small is beautiful is that if you look at fund performance, according to Kiplinger, Greenhaven Road has outperformed every single large cap mutual fund they have tracked in each of the last two years. The top funds were different in each year, but Greenhaven outperformed all of the large cap mutual funds in both one-year and two-year periods over the last two years. The results are similar for hedge funds with more than \$1 billion in AUM.

ETFs – PENNY WISE AND POUND FOOLISH?

So hopefully we accept that small is actually an advantage to generate percentage returns, but what about index funds? A lot of “smart” money is flowing into index funds. Index funds are “in” – and active management is “out.” Well, if that is the consensus, it must be right. Right? As the largest investor in Greenhaven Road, I think about the advantages of index funds. The thought of giving money to a low-



cost robot while I go sit on a beach sounds pretty good. Why lose my hair trying to invest when I could just watch the money pile up with an ETF strategy? Why go through the pain of active management if an ETF is really the best strategy? I think Murray Stahl of Horizon Kinetics had a really interesting analysis in his last quarterly letter. He pointed out that as money flows into the indices, they have to buy shares in every single company that comprises the index. Since 2006 more than \$100B has flowed out of actively managed funds while more than one trillion dollars has flowed into ETFs. The direction of the tide is clear. Murray then goes on to look underneath the hood of some ETFs pointing out that as funds flow in, the ETFs are required to buy the shares of the components, good or bad. He then goes on to look at the growth and earnings of the 30 largest companies in the S&P 500 and the numbers do not scream “buy more S&P 500” to me. The companies in the index have benefitted from record high margins, record low interest rates, and expanding P/E multiples. The top 30 companies are growing at less than 5% and, if you exclude Google and Facebook, are growing revenue at 1% per year, and, at the end of the year, the index was being rewarded with a PE multiple of 19. So there is a combination of low growth, high valuation, and a variety of factors that could turn (margin, rates, and multiple) and dramatically impact returns going forward. I recommend reading the whole piece, which can be found on their website:

http://horizonkinetics.com/docs/Q4%202014%20Commentary_FINAL.pdf

I am fundamentally a cheap person. My wife loves to remind me of when I wanted to install central air conditioning in our house by myself, despite having zero relevant experience – just to save the money. I figured out we could save even more by delaying the purchase of air conditioning, so I used that strategy instead and still have not personally installed any duct work. I understand the wisdom of saving on fees, but the strategy of “buy the market ETF, it has gone up in the past, and do it in the least expensive way possible” reminds me of the argument for real estate in 2004. It has gone up in the past, it will go up in the future. I just believe that the market is made up of individual businesses that serve customers, have employees, have costs, and operate in fluid marketplaces. Some of those businesses have brighter prospects than others because of product cycles, customer wins, mergers, and dozens of other factors. As a result, some of these businesses are overpriced and some are on sale. When we buy clothes, we don’t buy a slice of everything at Bloomingdales, regardless of price. When we buy groceries we don’t buy a sliver of everything in the store. When it comes to our savings, why should we blindly buy a slice of everything? I think we can do better.



Yes, it is true, that the average investor performance will be the average market performance less costs, so if you can control the costs, on average you will have more money at the end. The flaw in the argument is that if you are reading this letter, you are not playing for averages, you are playing for personal optimization. We are trying for the best outcomes for ourselves. Let's take an example outside of finance for a second. Instead of your savings, let's talk about children. How would you feel if you got a letter home from your child's college saying, "We have decided to save money on school administration salaries, so the college is now being run by a computer? Don't worry, the computer has explicit instructions to accept only the largest students that apply and we will ignore what some might consider to be red flags like criminal records – we just accept children and there is no limit to the number of children we will eventually accept"? While this is not exactly the same as an index fund, it's not so far off either. For my children, I want a college president who is sending all of his or her children to the school and has agreed to take compensation based on outcomes that align with my children's interests. That is how I would personally optimize. This is effectively what Greenhaven Road is – our outcomes are aligned.

In his analysis, Murray Stahl went on to provide a bearish analysis for owning overall indices by looking at earnings multiples, tax rates, interest rates, and margins. Let's just stipulate that there is a bear argument for owning the entire market, what about the cost advantage of index funds? Obviously, I don't charge myself fees to manage my own money, so that is not really a fair question – but what about for you as a limited partner of Greenhaven Road? With our fee structure of a waived management fee and a 25% incentive fee over a 6% hurdle rate, your fees are still lower than an ETF under Greenhaven's structure in every scenario, except when returns are above 8% per year. When we lose money, you pay no fees. When we make 6% in a year, you pay no fees (better than an ETF). If the partnership returns 10% in a year, the incentive fee is 1% and so on. The only time you are paying large fees is when you have had large returns – so you are only paying for performance. So lower fees in a down, flat, and up less than 6% market – and potentially higher fees only when there are real returns. Despite the trillion dollars (there are 12 zeroes in a trillion) of inflows into ETFs, they don't strike me as a slam-dunk no-brainer on returns or fees vs. Greenhaven Road.



PERFORMANCE MATTERS

Why does performance matter? I mean, really, what is the difference between 5% and 10% a year? Yes, 10% is double 5%, but an extra 5% points: Who cares? If my \$100K grows to \$110K vs. \$105K because I got the higher return, of course, I am happy but not in a life-changing way. Even if I can get 15% or 20% over the course of a year, this example does not even provide me enough extra cash to buy the car I want. The reality, however, is that it matters a great deal over time. If you earn the higher rate of return on the larger balance of money year after year after year, it really adds up. Albert Einstein referred to the power of compounding as the eighth wonder of the world. If we take a 30-year timeframe and take the \$100,000 under different return scenarios, the dispersion of returns is enormous because of the power of compounding. In the 5% scenario, the \$100,000 grows into \$432,194, or more than quadruples after 30 years. If we can earn 10%, we do far better than twice as well (5% vs 10%), the \$100,000 would turn into more than \$1.7M after 30 years – so those 5% points made a huge difference. If you could get another 5% and actually earn 15% over 30 years, your \$100,000 will grow to more than \$6M, and 20% a year grows to more than \$23M versus the \$432,194 you would have earned at 5%, and that is why we care about a few extra percentage points if we can get them. As a point of reference, for the day-one investors in Greenhaven Road, your money has compounded at just under 19% a year after all fees and expenses for four-plus years – we have a long way to go, but are off to a good start.

GROWTH OF GREENHAVEN ROAD

As most of you know, after generating average annual returns in excess of 40%+ for the period from 2005-2010 in my personal account, I decided to set up a formal fund structure, Greenhaven Road. With a million dollars of personal capital and a million dollars from friends and family, including former bosses and colleagues, Greenhaven Road was born. As returns have been strong, there have been a number of people who have reinvested over the years. Some were expected (thanks, mom), some were almost obligatory (thanks, mother-in-law), and some I think earned (thanks, college roommate, tennis partner, and the other day-one investors who are still part of the fund). I faced two challenges. The first was that I didn't want to approach any additional friends and family for more investments. I was out of friends and family who I thought would appreciate the opportunity set available to us as a small fund, the fairness of the fee structure, and the alignment of incentives. The friends and family I had not asked were either



not accredited investors, and thus not an appropriate investor – or I feared that they would have been only investing as a favor. Maybe it is a character flaw, but I could not bring myself to seek pity capital. Which brings us to the second issue. While small is beautiful in terms of the investment opportunities it presents, the economics of a small fund are not as beautiful as a larger fund. In fact, during the first two years of Greenhaven Road, the fund provided zero income. With no management fee, three beautiful daughters, and a love of food, I worked another job so that I would not let a need for short-term returns and income compromise the investing process. I am not sure what it says about more traditional funds with dozens of employees that a guy working part time out of his basement was able to put up better numbers, but that is what happened. Managing the fund “on the side” was possible because of our concentrated low turnover strategy where we only need a few good ideas a year and weren’t trading on news flow. Most weeks we do not buy or sell a single share. I don’t think performance suffered because of my other professional commitments over the last four years. I had executed on a similar strategy for the five previous years to the launch of Greenhaven with similar outside commitments.

If performance did not suffer – what did? The marketing of the fund suffered. Or to be more accurate, there was no marketing of the fund. In the fall of last year, I started to fix that. I significantly reduced all other professional obligations to create the time for marketing. The first step was the creation of a website cleverly named www.greenhavenroad.com. Additionally, because of changes to the law, hedge funds are allowed to do certain types of marketing. As a result, I have begun marketing efforts, and the results have been very encouraging. We have added more limited partners in the last two months than we added in the last two years and there is another group of verbal committers which would take that number even higher. It turns out if you have strong returns, a fair fee structure, aligned incentives, and spend time marketing to a broader audience, there is interest. So where does this leave us? I am spending more time on the fund, but some of it is going to marketing instead of just stock picking, and we have secured modest office space.

The fund remains under \$10M in assets. Because the fee structure is only an incentive fee and my wife and I remain by far the largest investors, there is no point in bringing on money just to bring on money. My incentives are to grow our personal capital and to have performance in excess of 6% - not to just vacuum up money blindly. Thus, I am going to limit new investments to 10% of capital in any given month unless there is a severe dislocation in the markets that provides an incredible opportunity. I am not



worried about a tsunami of new money, but wanted to make you as limited partners aware of the efforts, and let you know that you will always have first priority if you decide that you want to make an additional reinvestment. I will also email you the new investor deck, all 40-plus pages. I think you will agree that we have come a long way in four years.

TOP FIVE HOLDINGS

Careful readers will notice that, consistent with our low turnover strategy, the top five holdings are the same as last quarter. Over the course of the first quarter, Fiat Chrysler Automobiles, which we discussed briefly in the last letter, grew to be the fund's largest position as it appreciated (non-currency adjusted) more than 50% in the first three months of the year. We have not sold any shares yet, as there are discrete catalysts on the horizon including a spinoff of Ferrari, debt restructuring, and a strong product lineup. In addition, there is a world-class CEO with secular tailwinds that include lower gas prices and strong vehicle demand and a very aligned board chair, John Elkann, whose family holding company Exor owns 375 million shares. He is a strong capital allocator and focuses on return on capital rather than growth for growth's sake. There are math games to be played with the Fiat spinoff and the potential valuation it could receive. The optimists are hoping for a luxury brand multiple – not a car company multiple. Last time I checked, Ferrari was in the capital intensive car business – so I think it is a stretch, but if Ferrari is awarded 10X cash flow multiple, it would imply €3.00 per FCA share and have the stub Fiat/Chrysler trading at less than 4 EBIT, which is not a demanding valuation and a discount to peers. Given the discounted valuation, strong product lineup, potential for margin expansion, and world-class CEO, a post-Ferrari spinoff acquisition of Fiat is also a very plausible scenario, we are just holding our shares and not trying to “trade around” the position. As a group, the underlying businesses of all of our top five positions were healthy with growing revenues and expanding margins.



Company	Ticker	Description/Thesis
Fiat Chrysler	FCA (BIT)	An auto manufacturer undergoing a turnaround and an expansion led by a world class CEO with strong capital allocation skills. The company has a robust product lineup including model refreshes and line extensions. There is an upcoming spinoff Ferrari and a longer term opportunity to reduce borrowing costs as Chrysler debt is repaid which "ring fences" Chrysler cash.
Fortress Investment Group	FIG	The share price is more volatile than the underlying business. There is downside protection with more than \$3 per share in cash and investments and a strong alignment of management interests with common shareholders because management owns more than 50% of the common shares. There is also significant upside from performance fees on the \$67.5B in assets under management. The company's move towards raising "permanent" capital through publicly listed vehicles is a very positive development as it eliminates the need to return funds at the end of a funds life. They are well positioned in health care and transportation to raise large sums of capital over time. There has also been strong performance in Springleaf Financial which Fortress holds 80% of.
ChipMOS	IMOS	A semiconductor assembly and testing company that at the time of initial investment was trading at a trailing P/E of over 200 but less than 4 times cash flow. Overall the business is healthy with revenue growth y/y of 5%+, expanding margins in their LCD business, a modest stock buy back, and capital expenditures in line with depreciation for the foreseeable future. Over the next six months the company will attempt to further simplify the capital structure and focus on a Taiwan listing which should allow the company to be valued in line with its peers leading to multiple expansion and share appreciation. This will likely be accomplished with a large buyback and a conversion of NASDAQ shares to an ADR for the Taiwan listing. This is a healthy business that now has a strong balance sheet and an opportunity for earnings growth and multiple expansion through a primary listing in Taiwan.
RIB Software	RSTA (DE)	An underfollowed German software firm focused on commercial real estate construction. The firm has a very high value proposition for clients reducing both construction time as well as costs. The company has a strong base of recurring revenues and a history of profitable growth. While growth and returns will likely be very lumpy, this company has the potential to be a "multi bagger".
American International Group Equity and TARP Warrants	AIG	A leading insurance firm trading at 70% of a growing book value. If the company is able to continue to grow book value and the discount to book value diminishes with the passage of time this has the potential for a multi-bagger return without heroic execution required. The company sold its remaining stake in the Asian life insurer AIA and is in the majority of its airline leasing business. The net result is an overcapitalized company with the ability to further reduce debt, pay dividends, and repurchase shares significantly below book value.

Fortress had continued success in the important segments of their business, raising capital, and seeing strong returns in their core holdings such as Springleaf, which will grow significantly from their purchase of One Main financial from Citigroup. In March, the company paid a 38 cent dividend, bringing their full-year dividend to 80 cents on an \$8 stock. Fortress did suffer two setbacks over the course of the quarter. The first one, likely temporary, was poor performance in one of their macro hedge funds, which was caught betting the wrong way on the Swiss currency. The fund was down 4.7% in the quarter, so it will not be paying incentive fees in the short term. This is less than 5% AUM and is hardly fatal. Fortress also saw a decline in value of Nationstar Mortgage Holdings, which was in part caused by a secondary offering and the regulatory challenges faced by a competitor Ocwen. Both of these developments will likely prove positive for Nationstar Mortgage Holdings in the longer term, and thus Fortress.

Please note, there are two profiles of new holdings as an appendix to the letter.



RECENT EXIT

Over the course of the quarter, we did exit Zix software (ZIXI), which was a difficult decision since it has so many attractive components, including recurring revenue, high customer retention (95%+), a critical service (encryption), and product advantages (network effect of Zix network). This was a profitable investment for us, because our cost basis was below \$3 and our exit price was \$3.75. Ultimately, I lost confidence in management. They had invested significantly in new products in adjacent markets. Given their large installed base that renews their contracts every 2-3 years, the opportunity to cross-sell is enormous. They simply have not been able to convert. They have gained some momentum, but quarterly customer adds in the new product categories were measured in the tens (not tens of thousands). We will revisit Zix over time, since there are many attractive elements to the business, but as investments in new products continue without the contribution, the valuation is less compelling. If they ever actually figure out how to cross-sell their products, their investors will do quite well in my opinion.

SHORT SIDE

The short side remained an area with limited activity focused primarily on indices. We initiated a small short position in a consumer packaged goods company that has had modestly declining revenue, health concerns about its products, and still sports a PE of more than 20. This company has a strong balance sheet and capable management; this is not a company that is going to zero anytime soon, but I believe can and should have multiple compression. The individual company short positions remain very small, with no single short position being larger than 2% of the overall portfolio.

OUTLOOK

Fortunately, I am not directly compensated on predicting the direction of interest rates, because I would have thought the bottom was hit long ago, yet the French 10-year bond is yielding less than half of a percent and the German 1/10 of a percent with the *Wall Street Journal* quoting a JP Morgan fixed income analyst, “It is now just a question of time until we get to zero on the German 10-year bond yield.” I am not sure who is lining up to buy that paper, but I don’t see that party ending well. The good news is that U.S. employment remains strong, since we are the beneficiaries of low rates and low oil. The Greenhaven Road portfolio is positioned for the Goldilocks economy to continue. We are not counting on rapid GDP



growth or rapid multiple expansion, but with our long bias, we are investing under the premise that the bottom is not about to fall out of the economy. In my opinion, it is only a plus when I see companies that benefit from rising rates, because they will come eventually – cycles have not ended. As I have ended my last two letters ... We will have down quarters and years, but I remain optimistic. The fund remains by far my largest personal holding, so I am eating my own cooking every single day. Thank you for the opportunity to manage your assets alongside mine and my family's.

Sincerely,

A handwritten signature in blue ink that reads "Scott A. Miller".

Scott Miller



NEW POSITIONS

We initiated two new positions over the course of the first quarter. In the current environment, the table pounders are harder and harder to find, as a consequence these are “starter” positions which are sub-5% positions.

Oppenheimer Holdings (OPY - \$22.61). There is a decent chance that you have never heard of this \$300M market capitalization company, and if you have, you likely think it is a small investment bank. I thought it was a B player in the investment banking industry, which is not a particularly attractive market position or industry. Fortunately, there is more to the story. Yes, Oppenheimer is an investment bank and a market maker, but, far more importantly, it has a large asset management business, which has the benefit of high margins and recurring fees. In fact, Oppenheimer has more than \$87 billion in client assets under administration and \$26 billion in client assets in fee-based programs, employing more than 1,000 financial advisors. There are literally dozens of asset managers, so what is interesting about Oppenheimer? We can start with the CEO, who owns 22% of the company and has an impressive track record of growing the business over the previous 20-plus years through organic growth and acquisitions. His salary is reasonable, they are not issuing piles of options, he makes money when we make money – through the appreciation of the shares. The valuation is attractive, as we purchased our shares 20% below tangible book value. Tangible book value is what we should be left over with if we just stopped the business and sold the parts. Oppenheimer has historically traded at a premium to tangible book value, and acquisitions in the space also typically happen at a premium to tangible book value. Like our AIG investment, just closing the gap between the current price and a growing tangible book value can provide double-digit annual returns.

Perhaps more important to the downside afforded by buying below tangible book, Oppenheimer is under-earning because of one-time and temporary events. As a result, earnings have fallen off a cliff, declining from \$1.85 per share in 2013 to \$.65 per share in 2014, but may not stay there. There are three areas in particular: the first is a one-time regulatory settlement of \$20M for issues related to the sale of penny stocks (there are 14M shares outstanding, so more than \$1 per share in pretax earnings). It is highly unlikely there will be issues with this again. The second area of under-earning is from the alternative assets group, which contributed \$33M in 2013 and less than \$1M in 2014 (another \$2+ in pre-tax earnings). Clearly their investing performance was less than stellar in 2014, but with more than \$1.5 billion under management in alternatives, a contribution of less than a million dollars is by definition under-earning. A final area of under-earning relates to money market fees. In our current zero-rate environment, Oppenheimer has been waiving fees they are entitled to for funds held in money market funds. Oppenheimer waived \$31 million in fees (another \$2+ in pre-tax earnings). The fees were waived in 2013 as well, and will continue to be waived if rates remain where they are - but it is an interesting call option on rising rates. If rates were to rise, they would also earn fees on substantial customer margin balances of \$800M.



In the short term, the earnings for Oppenheimer should improve, but the real opportunity with Oppenheimer is a sale, because as a sub-scale investment bank/asset manager, the earnings would be higher if absorbed into a larger platform. The 22%-owning CEO has not indicated that he is a seller, but he is 68 years old, so it is not inconceivable. In addition to the asset management group, which I will attempt to value in a moment, there is a Capital Markets group that generated \$18mm pre-tax income in 2014 and the Commercial Mortgage Banking group, which holds mortgage servicing rights. They hold \$4.1 billion worth, which are valued at \$42 million (\$3/share). These are highly salable as Fortress Investment Group owned Nationstar and others actively in the market purchasing the rights. The point is that, outside of asset management, there is value for Oppenheimer. There have been several transactions for asset managers and the metrics used vary, but several have happened at greater than 1% of assets under administration. Applying 1% of assets under administration multiple would imply an \$860M sale price for just the asset management business, less \$150M in debt with 14.2 million shares outstanding would yield a \$50 share price or almost 150% greater than our purchase price. It does not take a series of herculean assumptions to get to \$50-plus per share, and given the CEO owns 22% of the company, he has more than 100 million reasons to make it happen.

Of course, there are some risks with Oppenheimer, the largest one pertains to auction rate securities (ARS). Oppenheimer clients held \$2.8 billion in auction rate securities in 2008 when the market ceased functioning and their customer's "cash like" holdings became completely illiquid. There have been a number of lawsuits and settlements with regulators and Oppenheimer has slowly been settling and buying ARS from clients. As of the end of 2014, there is still \$100M of ARS that Oppenheimer could be forced to purchase from clients over time. These have value, but very limited liquidity, so buying ARS impacts the bank's capital ratio and is a very low return – thus they have dragged their feet on making additional purchases. The good news is that the ARS balance liability is capped and the magnitude of potential repurchases is approximately \$100M and is not fatal. The trends towards indexing and bulge bracket firms "poaching" brokers by paying them multiples of their last year's revenue is also troubling, but Oppenheimer has held their broker count steady.

Buying shares at below tangible book provides a margin of safety in a company that is under earning, has high insider ownership, and a valuable asset management business. As a result, the opportunity appears asymmetric, where we have limited downside with significant upside.

RADISYS CORP (RSYS \$2.18) We are not purchasing Radisys for their "primary" business. More than 75% of Radisys revenue comes from providing hardware to the telecom industry. This is a very competitive space with low gross margins (20%) and even lower net margins that the market typically rewards with very stingy multiples. Throw in the fact that the hardware business is declining and there is even less to like. Radisys is a company that did \$192M in revenue last year, and has a market capitalization of \$75M, net cash of \$13M and arguably another \$5M-\$10M in excess working capital. Radisys has been public for more than 15 years and had a market cap of more than \$1B in 2000. This has been a value trap for the past several years with terrible capital allocation. For example, they have purchased two companies



for greater than \$100M each (Conveidia in 2006 and Continuous Computing in 2011), yet currently have an enterprise value of less than \$65M at time of purchase. We have made this a smaller position, because of the poor track record of management, and the declining hardware business is not anything to get excited about.

The core thesis for Radisys is that, within the pile of cheapness, there is a little emerging software business that we can get excited about. Their software is used for VoLTE, which is voice services over a 4G LTE data network. In the past, wireless service providers used separate networks for voice services; these are called GSM and CDMA networks. There are lower costs for carriers for treating the calls as data on the 4G LTE networks. The software business is a high-margin (70%+), moderate growth (20%+), modest recurring revenue business. The VoLTE market was primarily limited to South Korea in 2013, but is expected to have greater than 100% CAGR growth for the next several years as carriers add the functionality, saving battery life for consumers and improving call quality – while saving the carriers bandwidth on their network. The software business (including non-VoLTE) has run rate revenue of \$45M.

The company gave guidance for 10-20% revenue growth with 65-70% gross margins while operating at a \$2 to \$8 million loss in 2015 with profitability to follow in 2016. The company also guided for the legacy hardware business to decline 10-20% but has improved gross margins of 25 to 30%, and should generate \$13 to \$17 million in operating profits in 2015. Something does not add up here if the guidance is even close to correct. Both the hardware and software businesses are being sold at less than 4X the profitability of the hardware business and effectively the software business is free. For the current stock price to be a true reflection of value, you have to believe that they will miss their earnings guidance by a wide margin, which is certainly possible, or that a \$45M-plus software business growing at more than 20% per year in a market segment growing more than 100% per year is worth nothing. The alternative scenario is that the new CFO begins to articulate the opportunity and economics in a more compelling fashion, VoLTE growth finally emerges, and the software business gets a software valuation. If the software business is awarded 1X forward revenue and the hardware is awarded a 4x EBITDA valuation, the stock is more than a double. Radisys is in trials with more than 30 carriers, which could provide additional upside. Thus, even with a tortured history, the Radisys opportunity is asymmetrical with far greater upside than downside as VoLTE gains traction.

The biggest risk is that the market never evolves. There are two negative data points for the overall VoLTE market. One of Radisys's primary VoLTE partners, Mavenier, preannounced a significant revenue miss of greater than 30%. Mavenier noted that they believe the orders were simply delayed and did not change guidance for the year. Another vendor in the space, not a large partner, Sonus, also had a negative preannouncement which was very similar in tone, sighting delayed orders.

The path forward for Radisys is very unclear. There are several paths to attractive returns for the equity holders. The sale of the hardware business could be one way to isolate the value of the software business. Remember, the whole company is being valued at less than 4X the operating profit of the hardware



business. Another path would be if the new CFO is able to more effectively articulate the opportunity in front of Radisys and get investors to ascribe value to the software offerings. Another path would be design wins with some of the 30 trials the company has under way. Mohnish Pabrai will often highlight the attractiveness of low risk, high uncertainty situations because most investors often ascribe too large a discount when the path to monetization is unclear. I think it is clear that Radisys has the “high uncertainty” portion of low risk/high uncertainty equation locked up. The company has come out and pre-announced positive results for the first quarter of the year with positive revenue and margin guidance. If it becomes more evident that Radisys is in fact low risk, we will increase our position size appropriately.



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