NeedhamFunds

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Dear Shareholders, Friends of Needham and Prospective Shareholders,

We are reporting results for the quarter and year ending December 31, 2018 for the Needham Growth Fund, Needham Aggressive Growth Fund, and Needham Small Cap Growth Fund. Our mission is to create wealth for long-term investors, but the fourth quarter was a step backward. January 2019 was a step forward as the Funds earned back most of the fourth quarter 2018 losses.

Needham Funds' Fourth Quarter and Year-End 2018 Results

In the fourth quarter, the Needham Growth Fund Institutional and Retail classes returned -14.11% and -14.22%, respectively; the Needham Aggressive Growth Fund Institutional and Retail classes returned -18.41% and -18.49%, respectively; and the Needham Small Cap Growth Fund Institutional and Retail classes returned -16.07% and -16.24% respectively. The Russell 2000 Total Return Index returned -20.20%, and the S&P 500 Total Return Index returned -13.52%. December 2018 was the worst December for the Dow Jones Industrials and the S&P 500 since 1931. January 2019 was a good step forward as the Funds earned back most of the fourth quarter 2018 losses.

In 2018, the Needham Growth Fund Institutional and Retail classes returned -9.83%% and -10.26% respectively; the Needham Aggressive Growth Institutional and Retail classes returned -15.36% and -15.80% respectively, and the Needham Small Cap Growth Fund Institutional and Retail classes returned -4.58% and -5.13% respectively. The Russell 2000 Total Return Index returned -11.01%, and the S&P 500 Total Return Index was down -4.38%. It was a horrible quarter, which made for a negative year. It was the worst year for stocks since 2008.

2018

It's hard to remember, but 2018 began as a continuation of the dream market of the last three years. The market and the Needham Funds responded positively to the Tax Cut and Jobs Act of 2017. The beginning of February brought a different story. The markets took a sharp downturn as the Federal Reserve raised interest rates and $1.5 trillion in "risk parity" trades began to unravel. The markets and the Needham Funds retraced their January gains.

At the start of the second quarter, rising interest rates and geopolitical risk and trade wars with Russia, China, North Korea and Iran dominated the market's laundry list of worries. However, May delivered a strong market and outperformance by the Needham Funds. Despite more talk of trade wars, the economy and inflation seemed not too hot and not too cold, and earnings were better than expected.

In June, a strong jobs report was followed by the Federal Open Market Committee's raise of its target interest rates for the second time in 2018. President Trump had a summit with North Korea's Kim Jong-un and reached broad outlines of a peace agreement—a shift from the fears of nuclear war that made headlines earlier in the year. By the end of June, global growth appeared to be robust, assuaging concerns of earlier in the year. The Funds and the markets were positive during the second quarter.

In late July, the U.S. Department of Commerce reported 4.1% annualized GDP growth for the second quarter and unemployment remained low at 4.0%. Some of the Funds' industrial and semiconductor manufacturing equipment holdings were affected by disappointing guidance relating to their European and Asian businesses. The MSCI EAFE (Europe, Australasia and Far East) Index was down for the year as of July 31, while the Needham Funds and the U.S. Indices were all positive. In July, the U.S. announced 10% tariffs on $200 billion of Chinese goods and China responded by imposing duties on over $100 billion of U.S. manufactured goods. These tariffs were effective September 24.

August brought an even better month for the markets and the Needham Funds. By the end of August, the U.S. and Canada had yet to reach a trade agreement. The weakness in international markets persisted and the trade rhetoric between the U.S. and China escalated.

September brought the third Federal Reserve interest rate hike for the year. At of the end of the third quarter, all three Needham Funds and the indices had positive returns for the year. However, international markets had turned negative; at September 30, China had returned (14.7)% year-to-date, Germany (5.2)%, Canada (0.8)%, and Italy (5.2)%.

Then came October with continued international weakness, trade war rhetoric, additional tariffs on U.S./China trade, and the prospect of a Federal Reserve December rate increase. The FAANG stocks were de-fanged in October, as Facebook, Inc. Class A (FB), Amazon.com, Inc. (AMZN), Apple Inc. (AAPL), Netflix, Inc. (NFLX), Alphabet Inc. Class A (GOOGL) and also NVIDIA (NVDA) fell an average of 16.4%; these stocks fell an average of another 11.1% in the first 19 days of November. Other high-growth companies that the market had previously rewarded with high multiples also fell.

October 2018 was one of the worst months for the markets and the Needham Funds in the last decade. The Russell 2000 was down -10.86% and the S&P 500 was down -6.84%. I recall the summer of 2011—it was the peak of the European sovereign debt crisis and included the Standard & Poor's downgrade of U.S. debt. The Federal Reserve and European monetary authorities responded in force with liquidity measures. The markets rebounded quickly in October and the fourth quarter of 2011 was positive. Ultimately, we suspect the current monetary authorities will respond in similar fashion.

November brought a reprieve, as the markets and Funds were positive or nearly even. During midterm elections, Republicans increased their majority in the Senate and Democrats won control of the House. An increase in the Producer Price Index led to concerns that the Fed would stay on a tightening course. Toward the end of November, Fed Chairman Powell appeared to change his stance, stating that he viewed interest rates as just below a neutral level. Previously, he said rates were a long way from neutral. Foretelling things to come: Apple (AAPL) was down 18.4% in the month.

Then came December—it was worse than October. In fact, it was the worst December since 1931. The Russell 2000 was down -11.88%, the S&P 500 was down -9.03%, and the Needham Funds were also down. To highlight the market's volatility, the S&P 500 was up or down more than 1% on 9 of 21 days, compared to 8 times in all of 2017. Trade fears, along with rising interest rates and a slowing global economy, weighed on the market.

On December 2, President Trump and Chinese President Xi Jinping agreed to halt new trade tariffs for 90 days to give time for detailed negotiations. The U.S. agreed not to increase tariffs on another $250 billion of Chinese goods to 25% from 10% on January 1. The market traded up or down based on talk of a trade deal with China.

On December 19, the Fed raised its target range for federal funds to 2.25-2.50%—this was the fourth increase in 2018 and the ninth since the Fed began raising rates in December 2015. The Fed appeared to be on course for two increases in 2019.

John's Commentary

Outlook for 2019

2019 began with the same market strength we saw in January 2018. However, 2018 started against a backdrop of euphoria, while 2019 began with despair and lower valuations. Through January 31, the Needham Growth Fund Institutional and Retail classes returned 9.57% and 9.47%, respectively; the Needham Aggressive Growth Fund Institutional and Retail classes returned 11.77% and 11.68%, respectively; and the Needham Small Cap Growth Fund Institutional and Retail classes returned 15.35% and 15.32% respectively. The Russell 2000 Total Return Index returned -11.25%, and the S&P 500 Total Return Index returned 8.01%.

The market started its move higher when the Fed indicated a cautious stance on rate increases and highlighted the risks of a slowing economy. While a Federal Reserve pause is good for the equity markets, we also recognize that 2.25-2.50% is still a historically low range for interest rates.

Our portfolio companies' fourth quarter earnings reports have shown a slowing in China business. While it's easy to point to trade friction, it's more likely that China's infrastructure spending got ahead of real demand and is due for a pause. We believe the U.S. and China could reach a productive trade agreement, which could be positive for the markets.

As I look to invest in North American small-cap companies with unrecognized growth potential, I believe that our small-cap portfolio companies' destinies are more in their control than perceived, and that they are less likely victims of macro risk. Success with their new products and services may happen, even if the Chinese economy slows or the Federal Reserve increases rates in 2019. We note that as a rule, monetary authorities pursue easy money policies. Paul Volcker is the one exception in the last 40 years. We believe equity markets could benefit in 2019 from those easy monetary policies.

Quantitative Strategies and ETFs versus the Needham Funds

At Needham Funds, we are active, fundamental managers in a world headed toward passive management and quantitative strategies. We evaluate companies and their business prospects. Actually, I am an inactive/active manager. I look to hold a company for a long time, which results in low turnover. I am a long-term investor in a few companies which I believe can outperform over the long term.

In January, *The Wall Street Journal* ran an article on quantitative strategies and the fourth quarter.[1] It quoted Rufus Rankin, Director of Research and Portfolio Manager at Equinox Institutional Management, "A lot of trend-followers ended the year down because it was tricky to catch many trends." Kathryn Kaminski, Chief Research Strategist at Alpha Simplex said, "But using mathematical models to predict where markets are headed has been difficult as prices have been whipsawed by trade negotiations and mixed economic signals." To see a more humorous interpretation please see the video titled, "*World's Worst Sheep Dog*."[2] A funny guy on Twitter re-titled this, *"Quant Traders in the Fourth Quarter."*

As the quants fine-tune their models to capture performance from new factors, they create a self-reinforcing momentum mechanism, which for the most part, we don't participate in. While most of our stocks were down in the fourth quarter, our companies continued to make progress on their new projects. In fact, the Needham Funds have rebounded and recovered all of their December losses as of January 31.

In the last decade, "growth at any price" stocks have worked and value has underperformed. While we are a growth-oriented firm, we are sensitive to valuation. We don't buy blindly value in the form of a low price-to-book or P/E. These companies may have overstated book values or business models broken by new technology competitors. Rather, we are attracted to technology companies with low multiples-to-revenue that invest in new products or distribution. Sometimes these companies take time to see the benefits of their investments and in the meantime, the stocks underperform. I am hopeful that 2019 will be a year of stock outperformance for some of our top small cap holdings, including PDF Solutions, Inc. (PDFS), Oil-Dri Corporation of America (ODC), KVH Industries, Inc. (KVHI), GSE Systems, Inc. (GVP), DIRTT Environmental Solutions Ltd. (DRT:TSE), and FormFactor, Inc. (FORM).

The Needham Funds Are Very Different from an Index

At Needham, we view our Funds' investments similar to a venture capital investor. Months, quarters or even years can pass without markets recognizing progress behind the scenes. Consequently, the Needham Funds are not correlated with the averages, as shown by an R-Squared of 79.97 relative to the Russell 2000[3] for the Needham Aggressive Growth Fund; 69.47 relative to the Russell 2000[4] for the Needham Small Cap Growth Fund; and 55.06 relative to the S&P 500[5] for the Needham Growth Fund. R-Squared measures the percentage of a fund's returns that can be explained by the returns of the benchmark.

As of December 31, 2018, Needham Aggressive Growth Fund held 55 positions. The Fund's top 10 holdings represent 62.52% of net assets. Therefore, the Fund has a very different constitution than the indices, as shown by its high Active Share[6] of 106.3% versus the Russell 2000 Total Return Index. The other Needham Funds also have high Active Share—Needham Growth Fund is 105.7% versus the S&P 500 TR Index, and Needham Small Cap Growth Fund is 98.5% versus the Russell 2000. We don't try to rotate sectors to match or beat an index. We look to invest in companies that might earn an above market, compounding long-term return.

[1] https://www.wsj.com/articles/computer-models-to-investors-short-everything-11547038800
[2] https://www.youtube.com/watch?v=p-9-3DtUzug
[3] Since inception on 9/4/01. As of 12/31/18.
[4] Since inception on 5/22/02. As of 12/31/18.
[5] Since inception on 1/1/96. As of 12/31/18.
[6] Active Share represents the proportion of portfolio holdings that differ from those in the benchmark index. As of 12/31/18.

Needham Small Cap Growth Fund (NESGX/NESIX)

The Needham Small Cap Growth Fund Institutional class returned -16.07% and the Retail class returned -16.24% in the quarter ended December 31, 2018. For the year, the Fund's Institutional class returned -4.58% and the Retail class returned -5.13% while the Russell 2000 Total Return Index returned -20.20% for the quarter and -11.01% for the year.

We were pleased with the Fund's significant quarterly and annual outperformance of the Russell 2000 Total Return Index. Outperformance was consistent throughout the year with many of our concentrated positions outperforming the broader markets. However, in the last few weeks of December, some of these positions declined owing to an overall market correction. While the fourth quarter turned the Fund's year from positive to negative, our cautious cash position and trading flexibility allowed us to take advantage of the correction and deploy significant amounts of our cash position into stocks at the end of December. Thankfully, this strategic decision allowed us to capture substantial recovery in the early part of 2019. The market for small cap companies continues to offer good value, and we will evaluate our position sizes and valuation targets.

The Fund continued its lean toward a concentrated portfolio of stocks, with top 10 holdings representing 55.35% of net assets at December 31, 2018. Top holdings at December 31, 2018 included Photronics, Inc. (PLAB), Amber Road, Inc. (AMBR), PDF Solutions, Inc. (PDFS), EMCORE Corp. (EMKR), Aquantia Corp. (AQ), Aspen Aerogels, Inc. (ASPN), Ultra Clean Holdings, Inc. (UCTT), Super Micro Computer, Inc.(SMCI), Hawaiian Holdings, Inc. (HA), and Electronics for Imaging, Inc. (EFII). The Fund's top fourth quarter contributors included Corium International, Inc., Akoustis Technologies, Inc. (AKTS), FormFactor, Inc. (FORM), Frequency Electronics, Inc. (FEIM), and Zscaler, Inc. (ZS).

The Fund's largest fourth quarter detractors were Aspen Aerogels, Aquantia, Ultra Clean Holdings, Electronics for Imaging, and Super Micro Computer. With regard to Aspen Aerogels' poor performance throughout the quarter, we observed that a significant institutional shareholder of the stock had been selling their position along with a general trend of tax-loss selling of small capitalization companies across the market. We do not believe that the fundamental story of the company has changed, and we remain excited about its new product launches and future growth trajectory. The stock has since partially recovered in January off its December lows, and its funding needs were greatly improved with a cash infusion from BASF.

While volatility may seem to be a bad word for the overall markets, it is a great chance for active managers to find buying opportunities. It is in these volatile markets when a cash position is truly strategic for small cap fund managers. Many small cap investment opportunities "trade by appointment," and we like to capitalize on these opportunities when liquidity is available to both buy and sell stock positions. We added to existing positions and also added many new small positions to the Fund, including Akoustis Technologies, TTM Technologies, Inc. (TTMI), Cohu, Inc. (COHU), Five9, Inc. (FIVN), Intevac, Inc. (IVAC), and Everbridge, Inc. (EVBG). We exited our holding in WageWorks, Inc. (WAGE), FireEye, Inc. (FEYE), and Orbotech, Ltd. (ORBK). The Fund ended the quarter with a cash position of 4.9%. We remain excited about the composition of the portfolio as we enter 2019, and we look forward to learning about new small cap prospects this year.

We continue to believe that a good environment remains for investment in equities. Three themes we are focused on include: 1) continuation of the growth in the semiconductor capital equipment industry; 2) 5G communication infrastructure; and 3) military and defense modernization. These three areas of investment impact much of our portfolio, and we believe that long term, they should create shareholder value.

We expect a continuation of volatility into 2019, as the markets evaluate any economic slowdowns, interest rate curve risks, Federal Reserve actions, government shutdowns, trade policy negotiations, and overall geopolitical risks. The Federal Reserve has indicated at this point in time that they are on hold for the near-term for any short-term interest rate hikes. This position may change if economic data improves throughout the year, but at the moment, the markets are applauding this pause in rate policy. The expectation of pro-growth policies has boosted confidence for both individuals and corporations, and this should translate ultimately into higher economic activity for many of our portfolio companies. The high-yield markets showed signs of weakness at the end of 2018 but has since recovered, which is also supportive of the small cap asset class valuations.

The Fund benefited from the previously discussed sale of Invuity and also saw the sale of its holdings in Corium International and Reis, Inc. We were very happy with the results, as Corium received a nice premium to current price and, similar to Invuity, avoided returning to the capital markets. Reis had announced it was running a strategic review of its business and it ultimately sold to Moody's Corporation (MCO). We reiterate from our last quarterly letter that mergers and acquisitions continued in the small cap universe, but have slowed since 2016. We believe this trend is a pause, and we expect to see increased M&A activity as well as economic growth to improve and benefit the Needham Small Cap Growth Fund in 2019.

Needham Growth Fund (NEEGX/NEEIX)

The Needham Growth Fund Institutional class was down -14.11% and the Retail class was down -14.22% in the fourth quarter, underperforming the S&P 500, which was down -13.52%. For the year, the Needham Growth Fund Institutional class returned -9.83% and the Retail class was down -10.26%, compared to the S&P 500's down -4.38%.

For the fourth quarter, the short position in Medallion Financial Corp. (MFIN) was the Fund's top contributor as the stock fell 29.5%. Historically, Medallion was a taxi cab medallion lender and is aggressively expanding their business in consumer and small business loans at the low-end of the credit spectrum. In a downturn, these loans could have higher than average default rates. Red Hat, Inc. (RHT) was the second-leading contributor and returned 30.7%. Red Hat agreed to be purchased by International Business Machines Corporation (IBM).

For the year, the Fund's largest holding, Thermo Fisher Scientific, Inc. (TMO), was the leading contributor returning 18.2%. The Fund first invested in Thermo Fisher in January 2000 at $13 per share and the investment has compounded at 17.6% per year. Thermo Fisher had a good year across its market segments, including biopharma, industrial, academia, and diagnostics. Trade Desk, Inc. Class A (TTD) was the second-leading contributor and returned 153.8%. The Trade Desk provides Software-as-a-Service used by ad agencies and brand managers for programmatic, digital ad campaigns. The growth of over-the-top video is a major opportunity for The Trade Desk. 2018 revenue is expected to have grown 48% with 21% GAAP operating income margin. The company has a culture of profitable growth.

The third-leading 2018 contributor was Red Hat, followed by Corium International, Inc. and Invuity, Inc.

The leading detractor for the fourth quarter was KVH Industries, Inc. which returned -21.5%. The company's third quarter revenue and earnings results were fine and at 1x enterprise value-to-revenues, valuation is moderate. Most likely the stock decline was a result of being a small cap stock caught in a risk-off, tax-selling period.

KVH's AgilePlans provides connectivity-as-a-service to the maritime industry and bundles a satellite antenna, air time, and news, entertainment and training programming. Customers pay monthly and are not required to sign a long-term contract. Customers save the capex upfront and retain flexibility should their business circumstances change. It has led to a 100% increase in unit bookings year-to-date through September 30, 2018. These strong results could show through in revenue and earnings in 2019.

In 2018, KVH worked to develop a photonic chip, a cost-reduced version of its fiber optic gyroscope (FOG) products. In December, KVH delivered prototypes to leading automotive companies. KVH's FOGs are used on most self-driving car programs today. FOGs help vehicles maintain positioning when they are out of range of GPS satellites. The cost-reduced version is designed to meet the requirements for mass deployment on autonomous vehicles. Sometime in 2019, KVH could announce a partner for scale manufacturing and automotive expertise. Long term, we believe KVH could be a significantly larger company and earn several dollars per share.

Super Micro Computer, Inc. also detracted from fourth quarter and annual performance—the stock was down 33.0% in the fourth quarter. The company was victim of a bizarre story published by *Bloomberg Businessweek* about Chinese People's Liberation Army hackers inserting "microchips the size of a grain of sand" into Super Micro servers, allowing the Chinese to spy on customers, including Apple, Amazon, and the Department of Defense. All of these entities and many others denied the story. Tim Cook of Apple personally called for Bloomberg to retract the story. From my experience in the electronics industry prior to Wall Street, I find the story highly unlikely. The article took Super Micro from $21.50 per share to a low of $8.50 in one day. The stock closed the quarter at $13.80.

The story hit Super Micro at a time of vulnerability, as it has yet to file its 10K for the June 2017 fiscal year. The company has concluded that the restatement is expected to move at most $50 million of revenue and under $10 million of net income between 2015 through 2017. These amounts represent 1-2% of revenue and less than 10% of net income. For all of the effort and expense, these changes seem immaterial. Despite weakness in the market for data center equipment, we believe Super Micro has earnings power of $2-3 per share.

Gilead Sciences, Inc. (GILD), another significant detractor, was down 18.3% in the fourth quarter. Gilead reported positive results for the third quarter and moved lower with the market. We note that with Bristol Myers-Squib Company's (BMY) proposed acquisition of Celgene Corporation (CELG), one Wall Street analyst suggested Gilead could be worth $104 per share in a merger. As of December 31, 2018, Gilead is the second-largest holding of the Fund at 6.45% of net assets.

For the year, PDF Solutions, Inc. returned -46.3% and was the Fund's leading detractor. PDF's legacy business declined and its largest customer, Global Foundries, announced that it was ending efforts to compete with Taiwan Semiconductor Manufacturing (TSMC). PDF had been working with GlobalFoundries on many leading-edge programs.

Throughout 2018, PDF investors waited for a contract announcement for the new DFI (Design for Inspection) offering. Importantly, the announcement came in mid-January 2019. I believe that PDF's Exensio Big Data Analytics, cash flow from the legacy business and cash on the balance sheet are worth $11-12 per share, above December 31 $8.43 share price. Should DFI and Exensio grow over the next few years, I believe PDF could earn several dollars per share and the stock could outperform.

The Fund's short position in Ubiquiti Networks, Inc. (UBNT) contributed in the fourth quarter, but detracted for the year, as the stock appreciated 40.7%. Last February, the Securities and Exchange Commission issued subpoenas to Ubiquiti and some of its officers requesting information relating to accounting practices, financial information, auditors, international trade practices, and relationships with third parties. The company stated it is in the process of responding to the requests and intends to cooperate fully with the SEC. Through the end of September, Ubiquiti bought back $400 million of stock, and on November 6, 2018, they authorized a new $200 million buyback. Management has done a good job of supporting the stock.

In 2018, the Fund added new positions, including DIRTT Environmental Solutions Ltd., which closed the year at 3.4% of net assets, Cryoport, Inc. (CYRX) at 1.1% of net assets, Taiwan Semiconductor (TSMC), and Zuoro, Inc. Class A (ZUO). DIRTT Environmental is using technology to disrupt the interior construction industry. DIRTT has an incredible 3-D virtual reality CAD system that allows peers in different locations to walk through a VR model of their design prior to sign-off. The CAD system then feeds manufacturing, which is done at several factories and assembled on-site. DIRTT competes with drywall and on-site construction. It is green as there is minimal waste at the factories and no waste material on-site. It is predictable and helps contractors stick to schedule.

When we first invested, I was attracted to DIRTT because of its Founder & CEO. Late in 2018, the Board replaced almost all of DIRTT's senior management team with people that have great experience in growing companies. I was skeptical at first, but have come to believe that the new team is making important changes that can help DIRTT reach its potential at multiples of its current sales level.

Cryoport is at the center of the ecosystem for transporting CAR-T cancer immunotherapies at temperatures as cold as -150C. Cyroport is part of the Gilead/Kite Pharmaceuticals' Yescarta launch and the Novartis AG's (NVS) Kymriah launch. CAR-T is a miracle of science, but as investors, we become immune (pun intended) to scientific miracles. By chance, I met a person who put a human face on CAR-T. He was recently treated with Yescarta at the Dana Farber Cancer Center outside Boston. He had gone through many other treatments. Yescarta was his last hope and after about a month, his cancer was gone. I met him at a CrossFit workout about six weeks after he left the hospital. The drug worked a miracle.

With GlobalFoundries' strategic choice to stop developing leading-edge semiconductor manufacturing processes, Taiwan Semiconductor is the sole supplier for Apple (AAPL), NVIDIA Corporation (NVDA), Advanced Micro Devices, Inc. (AMD), and all others except for Intel Corporation (INTC) and Samsung Electronics Co. Ltd (005930-KRX). While the semiconductor industry is suffering a downturn, we believe Taiwan Semiconductor will emerge as a strong leader.

Zuora went public in 2018. It is a software-as-a-service company that enables accounting and subscription management for the subscription economy. The economy is becoming subscription-centric; even industrial equipment companies are looking for ways of monetizing data and analytics through subscription business models.

The Fund exited its position in ComScore, Inc. (SCOR) as valuation appeared stretched given the outlook for the next few years. ComScore successfully completed filing its delinquent financials in March 2018 with its last previous filing over 2 years before. This was a costly and protracted restatement process. We also exited our long-time holding in WageWorks, as the company announced in March that it was unable to fill its financials.

As of December 31, 2018, the top 10 positions were 57.56% of net assets. The Fund had trailing 12-month turnover of just 8% and Active Share of 109.1% vs. the S&P 500.

<u>Needham Aggressive Growth Fund (NEAGX/NEAIX)</u>
Needham Aggressive Growth Fund Institutional class was down -18.41% in the fourth quarter and the Retail class was down -18.49%, compared to a -20.20% return for the Russell 2000. In 2018, the Needham Aggressive Growth Fund Institutional class returned -15.36% and the Retail class returned -15.80% compared to -11.01% for the Russell 2000.

Vicor (VICR) was the Fund's top contributor in 2018 but one of the largest detractors for the fourth quarter. Vicor returned 80.8% in 2018, as its modular power conversion systems were adopted in leading data centers. Vicor has worked with Alphabet Inc. (GOOGL) on its Open Compute data centers to distribute DC (direct current) power throughout a data center. In most data centers today, power goes through inefficient conversions from DC to AC (alternating current) and back again to DC. In March 2018, NVIDIA announced its newest DGX-2 artificial intelligence system, which uses Vicor power converters. Vicor is uniquely positioned to meet future data center, artificial intelligence and automotive processing needs. The stock may fluctuate based on the quarterly outlook for data center spending, but long term, Vicor addresses big markets, has strong potential margins and return on capital, is founder-run, and has no analyst coverage. That's my kind of company.

Other top contributors in 2018 were The Trade Desk, Cryoport, and Reis, Inc. In August, Reis agreed to be purchased by Moody's.

The short positions in Medallion Financial and Health Insurance Innovations, Inc. Class A (HIIQ) were the top contributors in the fourth quarter. FormFactor (FORM) was the third-leading contributor for the quarter, returning 2.5%. FormFactor reported a good quarter with positive results from 14nm logic, 18nm DRAM and systems sales, which offset weakness at Intel and Samsung.

PDF Solutions was the Fund's largest detractor in 2018 and the fourth quarter. GSE Systems, Inc. also hurt 2018 performance. Despite good results all year, GSE Systems fell 41.7% in the fourth quarter. I believe this micro-cap stock fell victim to tax-loss-selling in a horrible market. GSE Systems made progress on its vision of being a leader in training, consulting and technology-enabled engineering solutions to the power and process industries. In May 2018, GSE acquired True North Consulting. True North has complementary skills in in-service inspection for specialty engineering and in-service testing for nuclear engineering programs. GSE currently has a run rate of about $100 million in revenue, with about $10 million of EBITDA, and a market cap of just $60 million.

Other significant detractors for the year were WageWorks, Ubiquiti Networks (short), and IPG Photonics Corp. (IPGP).

In the fourth quarter, long-time holding Apple fell 28.9% and was the Fund's second-largest detractor. Apple reported weakness in China and with its new high-end phones. Apple was purchased by my predecessor on the Fund in 2006, before the iPhone was introduced. I continue to believe Apple represents a compelling value with long-term growth opportunities, thus it stays in the Fund. Other significant detractors in the fourth quarter were KVH Industries, Super-Micro, and Oil-Dri.

In 2018, we added three positions that remain above 0.4% holdings: Taiwan Semiconductor, Zuora, and Alpha Pro Tech, Ltd (APT). Alpha Pro Tech makes protective apparel for medical, industrial and infection control uses. It also makes covering products used in construction. Alpha Pro Tech is a micro-cap with no research coverage, it is family run, earns a good return on capital, and uses cash generated to shrink the share base.

The Fund exited long-time positions in Gilead Sciences, comScore, WageWorks, and Reis. We trimmed or reduced positions in many of the largest holdings, including Entegris, Akamai, Apple, Form Factor, MKS Instruments, Vicor, and Nova Measuring Instruments Ltd. (NVMI). At December 31, 2018, the Fund's top 10 positions were 62.52% of net assets. The Fund had an Active Share of 106.3% versus the Russell 2000 and had trailing 12-month turnover of 8%.

We welcome our new investors and thank all of our investors for their continued support. If you have any questions, thoughts or concerns, please contact us at (800) 625-7071 or at cretzler@needhamco.com or jbarr@needhamco.com. For information about the funds, please visit our website at www.needhamfunds.com.

Sincerely,

Chris Retzler
Portfolio Manager

John O. Barr
Portfolio Manager

Fact Sheet Links: Needham Growth Fund Needham Aggressive Growth Fund Needham Small Cap Growth Fund

The information presented in this commentary is not intended as personalized investment advice and does not constitute a recommendation to buy or sell a particular security or other investments.
This message is not an offer of the Needham Growth Fund, the Needham Aggressive Growth Fund or the Needham Small Cap Growth Fund. Shares are sold only through the currently effective prospectus. Please read the prospectus or summary prospectus and consider the investment objectives, risks and charges and expenses of the Funds carefully before you invest. The prospectus and summary prospectus contain this and other information about the Funds and can be obtained on our website, www.needhamfunds.com.
Investment returns and principal value will fluctuate, and when redeemed, shares may be worth more or less than their original cost. Performance data quoted represents past performance, and does not guarantee future results. Current performance may be higher or lower than these results. Performance current to the most recent month-end may be obtained by calling our transfer agent at 1-800-625-7071. Total return figures include reinvestment of all dividends and capital gains.
All three of the Needham Funds have substantial exposure to small and micro capitalized companies. Funds holding smaller capitalized companies are subject to greater price fluctuation than those of larger companies.
Needham & Company, LLC, member FINRA/SIPC, is the distributor of The Needham Funds, Inc.

Portfolio holdings subject to change. Needham Funds' ownership as a percentage of net assets in the stated securities as of 12/31/18:

SECURITY	**NEEGX**	**NEAGX**	**NESGX**	**SECURITY**	**NEEGX**	**NEAGX**	**NESGX**	**SECURITY**	**NEEGX**	**NEAGX**	**NESGX**
PDFS	5.01%	7.59%	6.98%	**ZS**	0.00%	0.00%	0.08%	**TSMC**	0.00%	0.00%	0.00%
ODC	0.59%	2.94%	0.54%	**TTMI**	0.00%	0.00%	1.58%	**UBNT**	-5.19%	-4.77%	0.00%
GVP	0.00%	5.79%	0.00%	**COHU**	0.00%	0.00%	1.96%	**CYRX**	0.80%	1.15%	0.82%
DRT	0.16%	3.31%	0.73%	**FIVN**	0.00%	0.00%	0.35%	**ZUO**	0.72%	0.45%	1.43%
FORM	4.88%	4.65%	0.79%	**IVAC**	0.00%	0.00%	0.65%	**NVS**	0.00%	0.00%	0.00%
PLAB	1.83%	2.24%	9.23%	**EVBG**	0.65%	0.63%	0.46%	**AAPL**	0.51%	7.77%	0.00%
AMBR	4.39%	3.32%	8.68%	**WAGE**	0.00%	0.00%	0.00%	**NVDA**	0.00%	0.00%	0.00%
EMKR	0.00%	0.00%	5.28%	**FEYE**	0.00%	0.00%	0.00%	**AMD**	0.00%	0.00%	0.00%
AQ	0.45%	0.00%	4.98%	**ORBK**	0.00%	0.00%	0.00%	**INTC**	0.00%	0.00%	0.00%
ASPN	1.11%	0.87%	4.28%	**MFIN**	-1.01%	-2.37%	0.00%	**005930KRX**	0.00%	0.00%	0.00%
UCTT	0.25%	0.04%	4.29%	**RHAT**	0.00%	0.00%	0.00%	**VICR**	0.88%	5.23%	0.00%
SMCI	3.23%	3.00%	3.84%	**IBM**	0.00%	0.00%	0.00%	**GOOGL**	0.00%	0.00%	0.00%
HA	0.30%	0.16%	4.02%	**TMO**	9.39%	0.00%	0.00%	**HIIQ**	-0.03%	-0.07%	0.00%
EFII	1.98%	0.98%	3.77%	**TDD**	0.00%	0.00%	0.00%	**IPGP**	0.85%	1.95%	0.00%
AKTS	0.00%	0.00%	3.23%	**GILD**	6.45%	0.00%	0.00%	**APT**	0.00%	0.55%	0.00%

FEIM	0.45%	0.25%	3.05%	**BMY**	0.00%	0.00%	0.00%	**NVMI**	1.60%	3.54%	0.00%