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The Power of Long-Term Compounding, 2010-2022

As Peter Lynch wrote in 1993, “You can find good reasons to scuttle your equities in every morning paper and on every broadcast of the nightly news.”[1] While the morning paper and evening news have faded from memory, the sentiment remains. It is easy to find reasons to sell equities, particularly right now. 2022 has been the worst year in decades for investors. While the headlines are depressing, we believe it is important to step back and think about long-term compounding.

Why Long-Term Investing

1) Investing for the long-term allows the investor to focus on strategic corporate issues, rather than macro-economic or market factors. Having an informed point of view on corporate strategy can have an impact of a company’s results and stock price. Economic forecasts are indeed the dismal science. Even economists at the major international organizations are just wrong. For example:

- “Fed has a poor record forecasting joblessness around downturns.”[2]
- “IMF shows poor record of forecasting recessions.”[3]

Stock market forecasts are even less useful. Occasionally, someone gets it right, but then is back to the mean, and wrong again. Do you remember Joe Granville and Elaine Garzarelli? They had a shining moment in the 1987 crash. Nouriel Roubini predicted the Financial Crisis. It is a challenge to find the one or two strategists and economists who are right each year. I’d rather try to find a couple of excellent companies.

2) A longer holding period is a major advantage because we get to evaluate the prospects of a product or service beyond the next 12-month analyst estimates. In fact, funds with a higher Turnover Ratio* generally have lower returns, as Turnover is a proxy for the fund's trading costs, which ultimately reduce a fund's return.[4] It’s not necessary to understand a product strategy if all you care about are the next quarter's earnings and next year's outlook.

3) By focusing on compounding returns in a single company, we avoid the taxes and commissions paid by our trading brethren. If we sell, we need to find a new place to deploy the capital. By focusing our research efforts on the company we own, we can develop a better understanding than our peers and make better decisions about a long-term holding.

4) It works. In 2015, Drs. Martijn Cremers, of Notre Dame, and Ankur Pareek, of University of Las Vegas Nevada, wrote Paent Capital Outperformance: The Investment Skill of Managers who Trade Infrequently.[5] It highlights that the top performing managers were those with the lowest turnover and the highest Active Share. Dr. Cremers invented the concept of Active Share** a few years earlier. Of course, investment managers have to pick the right stocks.

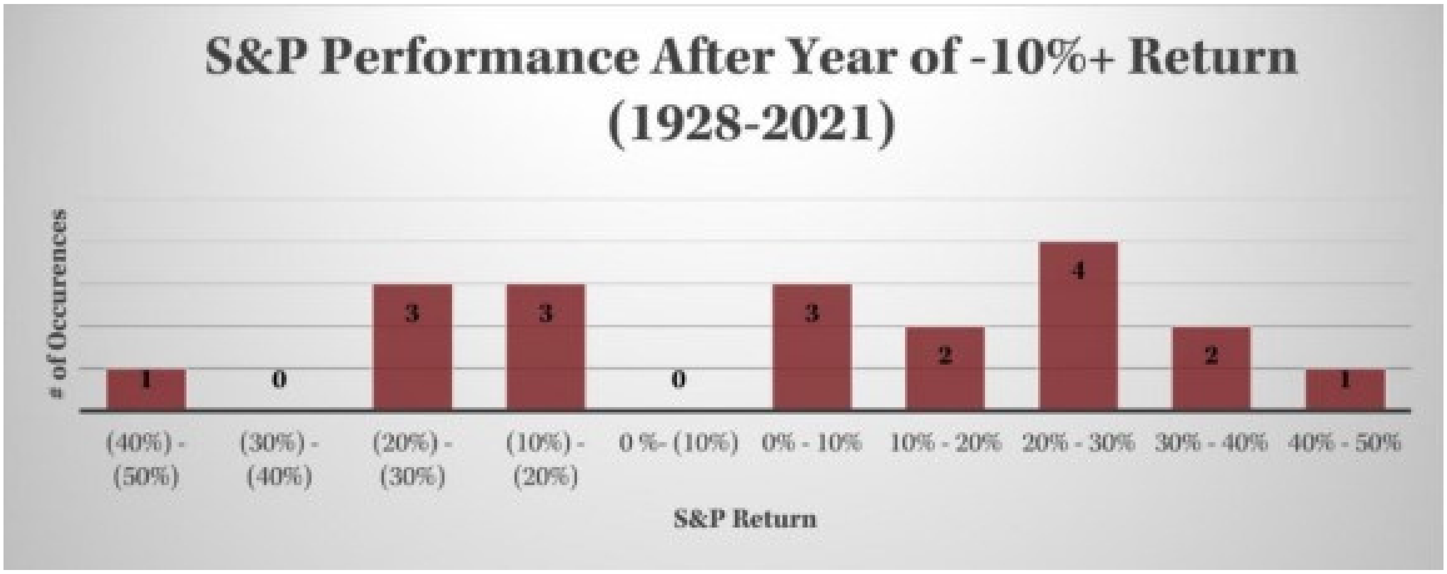
In this paper we review case studies of some of the companies that were the right stocks and have helped us to outperform, while also highlighting a few that were not right and what we learned. A multi-bagger success more than makes up for a mistake where one can “only” lose 1x your capital.

When examining market performance, it is a challenge not to focus on short-term performance. It’s natural to feel the euphoria of outperformance, or pain from a declining investment. However, when we take a longer-term view, we see that one year’s performance is not indicative of a portfolio’s lifetime return.

Since 1928, there have been 19 calendar years where the S&P 500 Index returned less than -10%. The chart below highlights the S&P 500’s performance in the year after the Index returned less than -10%. We chose this number as it roughly reflects the performance of the S&P 500 so far in 2022.[6]

12 of the 19 following years saw positive returns, with 9 of the 19 seeing a return of over 10%. As Berkshire Hathaway's Charlie Munger said, "The big money is not in the buying and the selling, but in the waiting."

*Turnover Ratio is the percentage of a mutual fund or other portfolio's holdings that have been replaced in a given year (calendar year or whichever 12-month period represents the fund's fiscal year).
**Active Share is an indication of the similarity of a fund's equity holdings and its benchmark.



Long-Term Compounding in Needham Aggressive Growth Fund

I have managed Needham Aggressive Growth Fund since 2010. From January 1, 2010 – September 30, 2022, Needham Aggressive Growth Fund (NEAIX) had an annualized return of 12.53% vs. the Russell 2000 Growth's 9.88%. The Fund has outperformed because it invested in a few "Hidden Compounders" that grew into "Quality Compounders" over many years. Of course, this past performance is not a predictor of future performance. Let's examine the source of this outperformance.

We look for "Hidden Compounders," which I define as the following:

- may grow to be 5-10x their current size
- managed by founders, family, or long-tenured CEOs
- may be investing in a new product or service

We look to buy these companies when they are small or microcaps and available at a margin of safety price. While the purchase price is an important measure directed at reduced downside participation, we earn returns by patiently holding. More than half of the Fund's outperformance over the last 12 ¾ years has come from the performance of ten stocks, and over 40% of the outperformance came from five stocks.[7] Seven of the top ten contributing stocks are current holdings that we classify as "Quality Compounders."[8] We purchased them when they were "Hidden Compounders," and their average holding period is over 12 years. (Of the other three contributors, one company was acquired, and two were large-cap companies, which we sold when they no longer met our investment criteria.)

Top Contributors

Here's a brief review of our investment in those top five contributors through the end of the third quarter of 2022. Long-term investors in Needham Aggressive Growth Fund will recognize these companies:

1) PDF Solutions, Inc. (PDFS) was first purchased in 2010 at $4 per share and closed September 30, 2022, at $25. In 2010, we saw a company trading below our assessment of the value of the R&D with a significant market opportunity. We believed the company was on a short-term path to being profitable. We have opportunistically added to this position over the years and have sold very little. Since 2010, the company has applied its technology to new product areas. Several of these periods of investment and stock underperformance lasted for several years. PDF Solutions has emerged as the leader in SaaS data analytics for semiconductor manufacturing.

2) Entegris, Inc. (ENTG) was also purchased in that stellar class of 2010 at $4 per share, and closed at $83 on September 30, 2022. The Fund purchased all of its Entegris holdings in 2010. Over the years, we have realized gains to manage the position size. Entegris has contributed dividends, realized gains, and unrealized gains. CEO Bertrand Loy has done a great job allocating capital to internal development and acquisitions.

3) Apple Inc. (AAPL) is an unusual holding for a fund categorized as small-cap. My predecessor Jim Kloppenburg first purchased Apple in 2006 at a split adjusted $2 per share, and the stock closed on September 30, 2022, at $138. Apple has continuously met our investment criteria for a Quality Compounder, so it has stayed in the Fund. We added to the position from 2010 -2013, around the time of Steve Jobs' illness and passing. We added again in 2016, when there was fear that Apple would go the way of Nokia and Motorola. Apple has also contributed dividends, realized gains, and unrealized gains. We have occasionally sold stock to manage the position size.

4) Gilead Sciences, Inc. (GILD) was purchased at a split-adjusted $9 per share in 2004 by Jim. We sold the last shares in 2018 at $70 per share. During our investment, Gilead commercialized its HIV drugs, which successfully treat AIDS, and acquired Pharmassets in 2011 with its cure for Hepatitis C. We exited the position in 2018 because Gilead had become a large-cap that we believe required an even more significant acquisition to maintain its growth trajectory.

5) The Fund purchased Akamai Technologies Inc. (AKAM) in 2011 at an average price of $33 per share, and it closed at $80 on September 30, 2022. Akamai was a top holding in those first years, and the stock was volatile around the company's earnings reports. Akamai invested and now has a large, growing SaaS security business, which is much less volatile. Akamai has compounded at a lower rate than our other top performing investments. We have realized gains throughout the holding period.

Summary of Top 5 Contributors, 1/1/2010 - 9/30/2022

Ticker	Company	% of Needham Aggressive Growth Net Assets***	Year First Purchased	First Purchase Price
PDFS	PDF Solutions, Inc.	6.50%	2010	$4
ENTG	Entegris, Inc.	3.93%	2010	$4
AAPL	Apple Inc.	3.09%	2006	$2
GILD	Gilead Sciences, Inc.	0.00%	2004	$9
AKAM	Akamai Technologies, Inc.	0.88%	2011	$33

*** % of Net Assets as of 9/30/2022

Attribution

Information Technology, Communication Services, and Health Care were the best performing market sectors during the last 12 ¾ years. The Fund's performance benefitted from its overallocation to Information Technology. However, the Fund's IT overweight was a minimal contributor relative to the contribution by the individual companies. The Fund also benefitted from being underweight the underperforming Biotechnology sector. Our bias toward purchasing with a margin of safety and our acknowledged lack of expertise in judging the outcome of binary drug trials helped us have a few small biotech winners and avoid significant losses.

Top Detractors

While this strategy outperformed the benchmark, not all of our investments work. Two of the leading detractors over the last 12 ¾ years were Mercury Systems, Inc. (MRCY) and DIRTT Environmental Solutions Limited (DRT-TSE). When the Fund first purchased Mercury in late 2010, it was a $400 million market cap maker of advanced computing systems with a small Federal Systems business. We were excited about prospects for Federal Systems, including their Gorgon Stare wide-array surveillance and processing drone program. Mercury was a top ten holding, peaking at 2.81% of the Fund in the fourth quarter of 2011. In 2012, we thought Mercury overpaid for several acquisitions and the stock suffered. It fell from our average purchase price of $18 to a low of $8 per share. We sold our position by the end of 2012 at a loss.

In the end, patience would have been the better plan for us. Mercury closed at $41 per share on September 30, 2022, compounding at 17% annually from that $8 low in 2012. CEO Mark Haslett has done a great job with an M&A strategy.

Another major detractor was DIRTT Environmental Solutions Limited. In 2015, we met DIRTT and it seemed a great fit - a $500 million Canadian Dollar (CAD) market cap company led by charismatic founder Mogens Smed. It addressed the large interiors construction market with an amazing Computer-Aided Design system tied to their manufacturing plant. Sales grew from $140 million CAD in 2013 to $267 million CAD in 2016, with positive net income for three of those four years.

By 2017, after many meetings with customers, distributors, management, and industry participants, we had a starter position purchased at $5 CAD per share. At the end of 2017, we were shocked when Mogens was removed as CEO but retained other responsibilities. Mogens was also shocked. In retrospect, there was great animosity between him and the board, and by the end of 2018, Mogens was completely out.

We liked the CEO hired in 2019 and held on to the position. However, the stock fell after mediocre results in the second half of 2019. Then came COVID! Interiors construction crept to a halt as did new orders. We weren't sure the company would make it through and sold the position by June 2020 in the $1-2 CAD per share range.

We liked Mogens Smed's vision as Founder and CEO. When the Board concluded that change was necessary for governance reasons and removed Mogens, the company lost its guidepost. A guidepost without proper governance grounding is trouble waiting to happen. Ideally, we would have realized that Mogens was not the right long-term leader and not gotten involved. Once involved, we should have sold once we saw the drama and acrimony in the CEO change.

Conclusion

The Needham Funds' mission is to create wealth for long-term investors. The Fund remains focused on the long-term opportunities of its holdings. Throughout 2022, we found opportunities to put money to work carefully. We believe many of the Fund's new investments are well-positioned to handle inflation and benefit from shortened supply chains. We have waited years for some of these prices. While we can't predict the future, we know that in the past we've succeeded by selecting a few companies that outperformed and holding onto our investments.

About Needham

The Needham Group, Inc. is an independent, employee-owned firm with consistent leadership for 36 years. Needham has two subsidiaries, Needham & Company, LLC and Needham Investment Management, LLC. Needham & Company was co-founded by George Needham in 1985 as an investment bank focused on small and midcap companies, with deep sector expertise in technology - namely semiconductors, software, and life sciences. Needham & Company offers investment banking, sales, trading and publishes equity research on over 450 public companies in 20 sectors.

Needham Asset Management was founded in 1992 to invest long-term in small and mid-cap companies. Today, Needham manages over $574 million across three 1940 Act mutual funds and two hedge fund limited partnerships.

[1] Lynch, Peter. One Up on Wall Street.
[2] https://www.bloomberg.com/news/articles/2022-10-06/fed-has-a-poor-record-forecasting-joblessness-arounddownturns
[3] https://www.ft.com/content/60581224-3335-11e8-b5bf-23cb17fd1498
[4] https://personalfund.com/mutual-fund-and-etf-turnover-ratio/
[5] https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2498743
[6] S&P 500 Index.
[7] Factset, Portfolio 3.0, NEAGX vs. iShares Russell 2000 Growth ETF, 2 Factor Brinson Attribution
[8] The Growth Factor, Vol. 31, on Investment Process: https://www.needhamfunds.com/gf_commentary/needham-aggressive-growth-fund-investment-process-chuck-jaffes-money-life-podcast/

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