

Investing in the “Picks and Shovels”

Mark Twain is credited with saying, “When everyone is looking for gold, it’s a good time to be in the pick and shovel business.” In my pre-Wall Street experience, I sold Electronics Design Automation software to companies participating in the gold rush of the integrated circuit and electronics system industries. I gained an early appreciation for the technology, tools, and infrastructure that enable high-profile, public-facing industries and applications.

As Portfolio Manager of the Needham Aggressive Growth Fund and Needham Growth Fund, I focus on identifying and investing in infrastructure providers, which I refer to as “picks and shovels,” for a portion of the Fund’s portfolio. This focus spans both traditional infrastructure companies and the evolving landscapes of life sciences research and manufacturing, and the digital era, which encompasses software, semiconductors, and data centers.

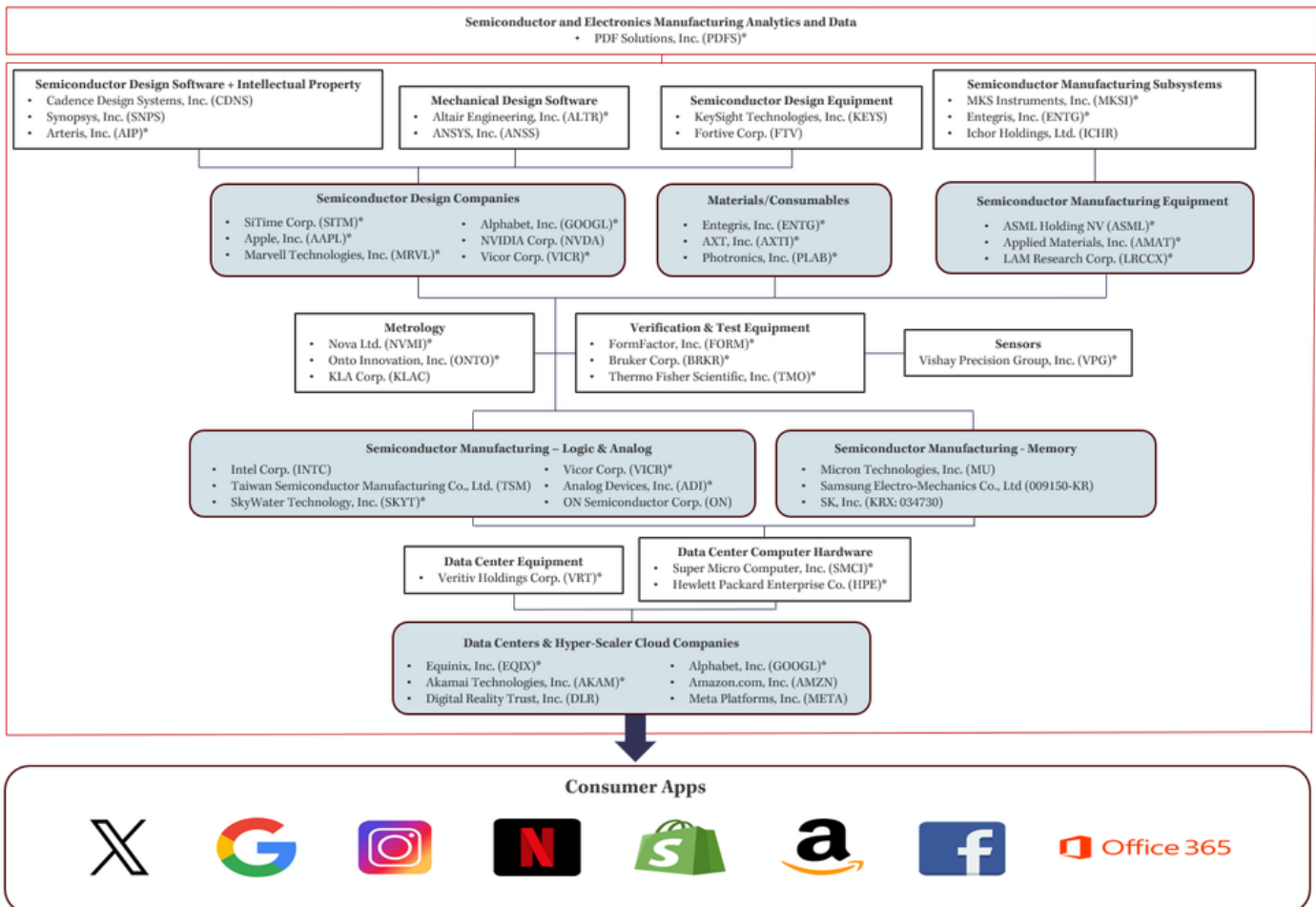
In my latest quarterly commentary, I recommended [The Titanium Economy: How Industrial Technology Can Create a Better, Faster, Stronger America](#), by Asutosh Padhi, Gaurav Batra, and Nick Santhanam of McKinsey & Company. The book suggests that when the United States directs its investment efforts toward manufacturing and strengthening the national business infrastructure, the nation's economy and prosperity will experience accelerated growth. This theme of investing in companies that play an important role in the infrastructure of their respective industries is prevalent within the Needham Aggressive Growth Fund and the Needham Growth Fund.

The Evolving Semiconductor Industry

The semiconductor industry is no longer dominated by an annual PC or cell phone cycle. These days, semiconductors are used in most consumer and industrial products, and with the 2022 passage of the CHIPS and Science Act, semiconductor manufacturing capability is now recognized as a core national infrastructure requirement.

The “Semiconductor Life Cycle,” diagram below follows the journey from concept to consumer applications enabled by semiconductors. Although not all companies in the diagram are portfolio companies, they are companies that we at Needham Funds have known for many years and believe are important parts of the semiconductor industry. The companies with asterisks beside their name were holdings of the Needham Aggressive Growth Fund and Needham Growth Fund as of June 30, 2023.

SEMICONDUCTOR CHIP LIFE CYCLE – CONSUMER APPS



* Indicates a holding of the Needham Aggressive Growth Fund or the Needham Growth Fund as of June 30, 2023. Please refer to page 4 for more information.

To provide concrete examples (pun intended), let’s take a closer look at some of the Fund’s investments, or “picks and shovels”:

PDF Solutions, Inc. (PDFS)

PDF Solutions has been a holding of the Fund since 2010. PDF Solutions specializes in providing software, services, and solutions to the semiconductor and electronics manufacturing industry. It focuses on enhancing yield, integrating design and manufacturing, utilizing data analytics, optimizing process control, monitoring equipment health, and employing advanced analytics and machine learning to improve the efficiency, quality, and cost-effectiveness of semiconductor manufacturing processes. As you can see from the diagram, PDF Solutions is integral to all aspects of the semiconductor cycle, a key piece of infrastructure for semiconductor manufacturers globally. This importance is underscored by a nine-figure contract it signed in 2022 with one of the largest semiconductor manufacturers in the world.

Super Micro Computers, Inc. (SMCI)

Super Micro Computer has been a holding of the Fund since 2009. Super Micro is a global leader in providing advanced server, storage, and networking solutions for data center and enterprise environments. The company designs and manufactures a wide range of hardware components, including servers, motherboards, storage systems, and networking equipment. With the recent explosion of investment into Artificial Intelligence (AI), Super Micro has become an essential hardware infrastructure provider for high-performance, energy-efficient, and scalable solutions for companies that power AI-enabled products such as Chat-GPT.

FormFactor, Inc. (FORM)

The Fund first invested in FormFactor in 2013. The company designs and manufactures wafer probe cards used to test semiconductor wafers. The business is driven by new design starts. FormFactor has shifted its focus from DRAM (Dynamic Random-Access Memory) semiconductors to address advanced logic, NAND memory, and even cryogenic chambers for quantum computing. FormFactor recently stumbled with product quality issues and lost business, we believe temporarily, from a large customer. Should it succeed with this customer, we believe FormFactor could show the financial results we look for from a Quality Compounder¹.

Smith-Midland Corporation (SMID)

Finally, we highlight one of the Fund's more traditional infrastructure investments, concrete company Smith-Midland (not pictured on the chart above). Smith-Midland manufactures concrete road barriers, highway sound barriers, and construction siding. We were attracted by the need for road infrastructure spending, particularly in Smith-Midland's Southeastern U.S. home market, and the Fund first invested in 2019. Its national scale allows Smith-Midland to fund the testing required to meet State and Federal regulations. We were also attracted by Smith-Midland's business model, which includes royalties from its proprietary J-J Hooks barrier design from licensees across North America, and also its recurring revenue and high return on capital from leasing road barriers rather than selling them.

Conclusion

These are just a few of the developments across many markets for "picks and shovels" as the United States looks to re-shore manufacturing. We are excited to be a part of this important, long-term trend. As the shifting landscapes of traditional and digital industries evolve, the Fund will continue to identify "picks and shovels" that will enable these transformations.

[1] [Growth Factor 35: The Power of Long-Term Compounding](#)

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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. Also, all the of the Needham Funds are permitted to engage in short sales, options, futures, and leveraged trading strategies. The Funds’ use of short sales, options, futures strategies, and leverage may result in significant capital loss.

Portfolio holdings are subject to change and may be long or short. Needham Aggressive Growth Fund’s ownership as a percentage of net assets in the stated securities as of June 30, 2023: PDFS: 7.55%, CDNS: 0.00%, SNPS: 0.00%, AIP: 0.22%, ALTR: 0.96%, ANSS: 0.00%, KEYS: 0.00%, FTV: 0.00%, MKSI: 1.15%, ENTG: 3.31%, ICHR: 0.00%, SITM: 0.29%, AAPL: 2.35%, MRVL: 0.00%, GOOGL: 0.00%, NVDA: 0.00%, VICR: 3.95%, AXTI: 0.21%, PLAB: 2.97%, ASML: 0.88%, AMAT: 0.00%, LRCCX: 0.00%, NVMI: 3.42%, ONTO: 0.00%, KLAC: 0.00%, FORM: 0.51%, BRKR: 0.81%, TMO: 0.00%, VPG: 2.48%, INTC: 0.00%, TSM: 0.00%, SKYT: 0.03%, ADI: 0.00%, ONTO: 0.00%, MU: 0.00%, 009150-KR: 0.00%, KRX: 034730: 0.00%, VRT: 2.64%, SMCI: 8.41%, HPE: 0.00%, EQIX: 0.80%, AKAM: 0.63%, DLR: 0.00%, AMZN: 0.00%, META: 0.00%, X Corp. (formerly known as Twitter): Private, NFLX: 0.00%, SHOP: 0.00%, MSFT: 0.00%, and SMID: 1.68%.

Portfolio holdings are subject to change and may be long or short. Needham Growth Fund’s ownership as a percentage of net assets in the stated securities as of June 30, 2023: PDFS: 8.99%, CDNS: 0.00%, SNPS: 0.00%, AIP: 0.00%, ALTR: 0.00%, ANSS: 0.00%, KEYS: 0.00%, FTV: 0.00%, MKSI: 1.68%, ENTG: 7.43%, ICHR: 0.00%, SITM: 1.00%, AAPL: 1.10%, MRVL: 1.27%, GOOGL: 0.42%, NVDA: 0.00%, VICR: 3.35%, AXTI: 0.81%, PLAB: 2.78%, ASML: 1.15%, AMAT: 0.92%, LRCCX: 1.13%, NVMI: 3.73%, ONTO: 0.25%, KLAC: 0.00%, FORM: 2.78%, BRKR: 0.39%, TMO: 5.99%, VPG: 0.00%, INTC: 0.00%, TSM: 0.00%, SKYT: 0.00%, ADI: 1.38%, MU: 0.00%, 009150-KR: 0.00%, KRX: 034730: 0.00%, VRT: 0.00%, SMCI: 9.33%, HPE: 0.24%, EQIX: 0.00%, AKAM: 2.09%, DLR: 0.00%, AMZN: 0.00%, META: 0.00%, X Corp. (formerly known as Twitter): Private, NFLX: 0.00%, SHOP: 0.00%, MSFT: 0.00%, and SMID: 0.00%.