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DISRUPTIVE TECHNOLOGY THEMATIC INVESTING

OUTLOOK ON RISKS AND OPPORTUNITIES AFTER RECENT VOLATILITY

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INTRODUCTION

The high technology sector has seen a dramatic correction and high market volatility over the past six months. As one measure of this, the growth stock and technology-laden NASDAQ Composite index fell by 29% between 19 November 2021 and 12 May 2022.

We believe it is now appropriate to review the outlook for disruptive technology thematic investing. While we are alert to ongoing risk factors, we remain confident in the long-term outlook for this secular growth theme as we see many opportunities to invest in companies that are leading – and benefiting from – digital transformation.

In this paper, we review the risk factors, opportunities and key areas of debate. We also take a closer look at the potential for semiconductors as a vital foundational technology for digital transformation.

RISK FACTORS

After the recent correction and market volatility, several key risks remain for growth and technology stocks.

We have seen a significant factor rotation from growth to value stocks, driven in large part by increasing inflation and rising interest rates. This rotation could persist. Many high-growth companies that invest heavily in products and sales capacity are longer duration assets with a higher portion of their projected cash flow generation further into the future than is the case with more stable growth and value names. These stocks have recently undergone a significant contraction of their price/earnings multiple.

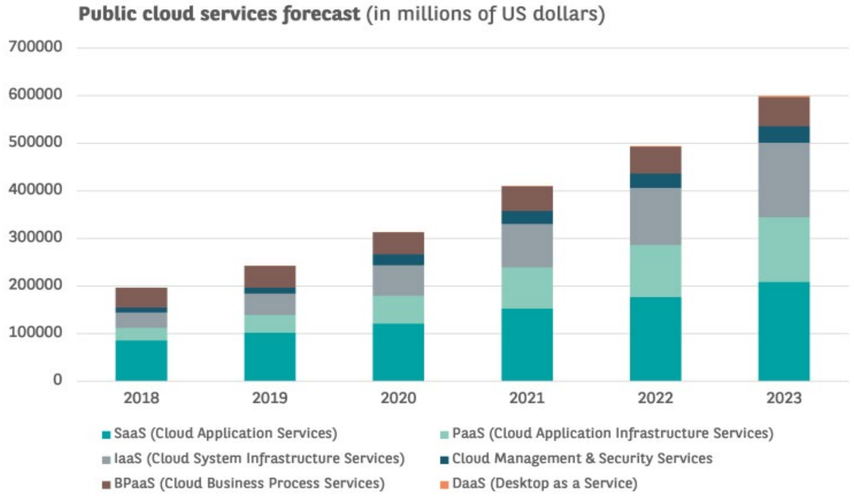
The risk of recession is increasing as the US Federal Reserve and other central banks tighten financial conditions to combat inflation. Additionally, the Russia/Ukraine conflict and associated sanctions on Russia are creating macroeconomic headwinds. Tariffs, Covid-19 response measures, semiconductor shortages and freight bottlenecks are all fuelling supply chain disruptions.

Finally, in the ‘Big Tech’ sector, there are risks related to antitrust and other forms of regulation.

POSITIVE TRENDS

Despite these risk factors, we see many reasons for optimism. We are confident in several long-term secular growth themes that are driving the digital transformation of the economy. We believe companies will continue to invest if they see digital transformation as an imperative to remaining competitive.

For example, the adoption of cloud computing continues to accelerate. IT research and consultancy Gartner updated its revenue forecast for cloud services in April 2022, raising the projection for the current calendar year to USD 500 billion, 37% higher than the level predicted in November of 2020.



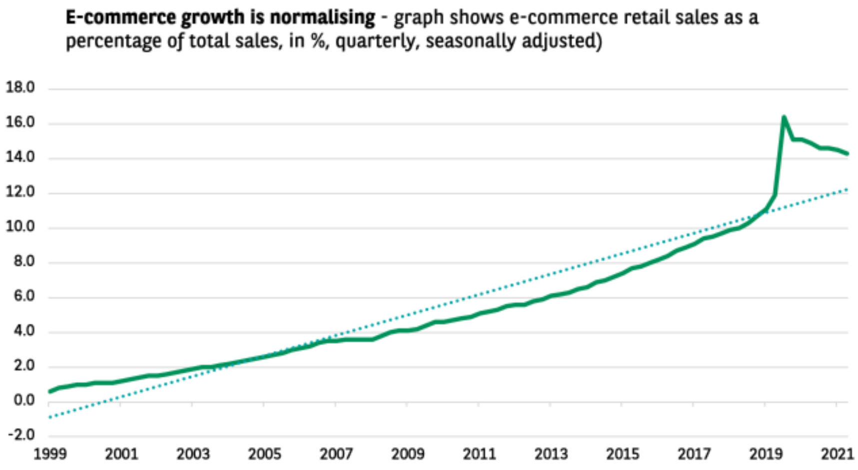
Source: Gartner, April 2022

In addition, we see the increasing adoption of artificial intelligence (AI), which is becoming a foundational technology with a proliferation of applications, automation, the Internet of Things (including at-the-edge processing – the processing of data as close as possible to its source to reduce delays by minimising the communication time between 'clients' and servers), and financial technology.

Disruptive technology trends are enabling the creation of new products, services and business models. They are making operations more efficient. In short, they are transforming the way we live and work.

KEY DEBATES

One of the main debates in the technology sector is the extent to which the increased demand seen during the first two years of the pandemic is sustainable. For example, e-commerce growth is returning to pre-Covid levels as in-person shopping and experiences recover.



Source: Federal Reserve Bank of St. Louis; May 2022

Stocks such as streaming fitness company Peloton and video conferencing firm Zoom are experiencing hangovers from their lockdown-led boom as growth rates retrench. However, we see overall IT spending holding up well as companies are committed to their digital transformation efforts and are continuing to invest in top priorities including cyber security and cloud adoption.

Gartner expects IT spending growth to decline from more than 9% year-on-year (YoY) in 2021 to 4% YoY this year, which is still a healthy level. Within this, cloud-based enterprise software should advance at more than twice the overall pace.

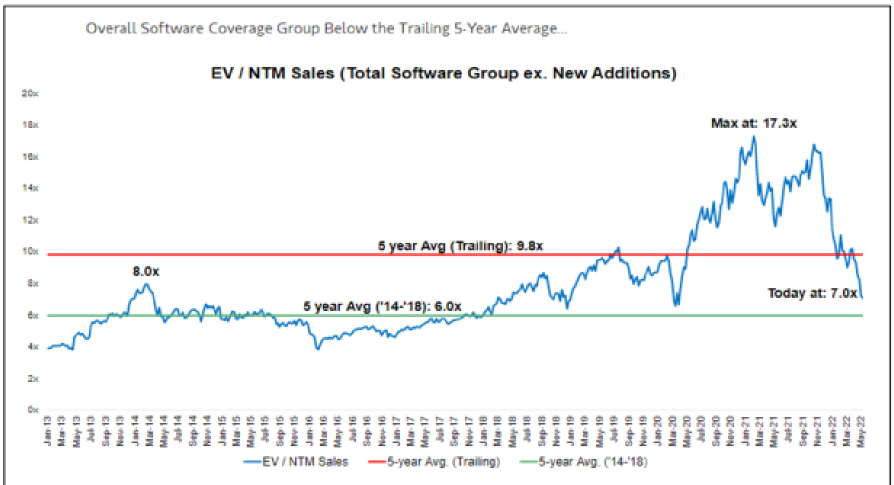
A second major issue for debate is whether valuations have compressed by ‘enough’. This is difficult to judge, since valuations are subjective and impacted by macroeconomic conditions including estimates of the risk-free rate. However, we see compelling valuations across the spectrum of companies that we monitor.

Our primary valuation methodology is discounted cash flow analysis, and we believe companies that lead and/or benefit from digital transformation and the related secular growth themes will generate strong revenue, earnings and free cash flow growth over a long investment horizon.

We also evaluate multiples relative to history and peers. For example, the software sector has corrected significantly. Using enterprise value to next 12 months projected sales (EV/NTM sales), the sector is currently trading at 7.0x, down by 60% from the peak of 17.3x a few quarters ago. This level is significantly below the five-year average, but still above the average over the 2014-2018 timeframe.

Most of the multiple compression has been from within the higher growth cohort, where multiples had been as high as 38.5x in early 2021 and are now down by 72% at 10.6x, based on Morgan Stanley data for those companies expected to grow annual revenues by 30% or faster.

In fact, even though it has corrected by less, the slower growth cohort (projected annual sales growth of 15% or less) is now trading at 4.4x, 20% below the trailing 5-year average and in line with the 2014-2018 average.[1]



Source: Morgan Stanley Research, Refinitiv, Company Data

Source: Morgan Stanley, Keith Weiss, 15 May 2022

WHERE WE DIFFER FROM THE CONSENSUS – SEMICONDUCTOR SUPER CYCLE

Many investors fear an impending inventory correction in the semiconductor segment. However, we strongly believe that the secular growth drivers are so compelling that any inventory correction is likely to be short-lived and unlikely to impact all segments of the industry simultaneously. We are comfortable with our overweight position to maintain our exposure to the positive long-term trends.

Currently, demand for semiconductors far outstrips supply despite evidence of slowing personal computer and smartphone sales. Recent comments on the semiconductor supply/demand imbalance include:

- Global Foundries’ management team reporting demand being 25% above capacity at the start of this year
- Taiwan Semiconductor’s CEO saying in his April earnings call that the company expects production capacity to remain tight through 2022. The firm is actively working to increase capacity during 2023 and beyond, citing a structural increase in the long-term demand for 5G and high-performance computing applications

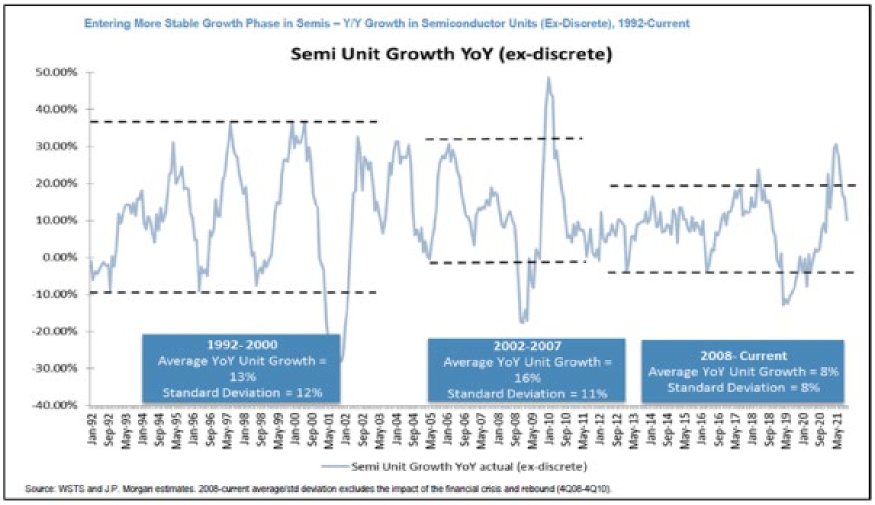
[1] Morgan Stanley, Keith Weiss – May 15, 2022 – ‘*Valuation Views 5-15-2022: Bouncing Along the Bottom*’

- The CEO of ASM Lithography relaying the details of a meeting with an industrial conglomerate executive, who told him about buying washing machines to repurpose the semiconductors in the equipment they sell.

With demand so much higher than supply, the industry may be able to absorb a mild recession without falling into oversupply.

We believe that the primary drivers of increased demand for semiconductors are the structural secular growth trends underlying digital transformation. Semiconductors are a foundational technology for cloud, AI, automation, and IoT. Over the course of the semiconductor industry's development, its end markets have broadened from mainframe computers to personal computers, to smartphones, and now to diversified industrial, automotive, and high-performance computing applications.

This diversification of applications helps to reduce the industry's demand volatility as no end-market dominates. Data from World Semiconductor Trade Statistics (WSTS) and JPMorgan shows the standard deviation (a measure of volatility) of the annual unit growth rate for semiconductors has improved from 12% in the 1990s to 8% today.



Source: JPMorgan, 16 December 2021

On the supply side, the structure of the semiconductor industry has dramatically improved in the past 20 years. The advent and success of the foundry business model has enabled innovation from fabless[2] design companies and has concentrated manufacturing among a smaller number of companies. The supply of memory chips has also consolidated to a handful of manufacturers. This has resulted in more strategic capacity decisions and less risk of structural oversupply. The increasing capital intensity and technology complexity are significant barriers for new entrants.

Looking ahead, we see the potential for continued strong growth for the semiconductor industry, led by automotive and high-performance computing (HPC) applications.

In the car sector, the USD-based semiconductor content per unit has risen dramatically from just over USD 300 in 2013 to almost USD 700 in 2021. This trend is set to continue as the average electric/hybrid vehicle has over USD 900-worth of chips; for high-end vehicles, this can reach USD 1200.[3]

In HPC, central processing units (CPUs) have been growing larger since 2005 to balance performance with power consumption. This results in fewer chips per wafer, causing wafer demand to rise more quickly than unit demand. As a result, companies that provide foundry services, certain types of semiconductor capital equipment and specialty materials have an opportunity to outperform the market.

SUMMARY

In recent months, the market environment has been difficult for growth and technology investors due to macroeconomic headwinds.

However, the digital transformation of the economy will continue and we remain constructive on the secular growth drivers underpinning this trend. Valuations appear more compelling in the wake of the recent correction and we are steadfast in our commitment to our investment philosophy.

[2] A 'fabless company' designs and markets hardware while outsourcing the manufacturing of that hardware to a third-party partner. The term is commonly used in relation to advanced chip designers, who hold the intellectual property (IP) for the chips they sell.
[3] Gartner, IHS, and JP Morgan Estimates, 16 December 2021

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Pam is the lead portfolio manager for our Disruptive Technology strategy and is responsible for helping guide the team's investments in the technology, Communication services and utilities sectors. She joined the company in 2016. Before joining BNP Paribas Asset Management, Pam was a portfolio manager and equity analyst at Boston Common Asset Management, State Street Global Advisors and Baring Asset Management. Pam began her career at Janus Capital Group as a senior analyst, where she conducted analysis of stocks with a specialisation in the technology sector.

Pam graduated cum laude from Harvard University with a degree in Applied Mathematics and received her MBA with Distinction from the Johnson School of Management at Cornell University.

Pam is a CFA charterholder and a member of the CFA Institute. She is based in Boston.