If not now, when?!

We believe that the market correction presents an attractive opportunity to buy software. We examined both historical and fundamental data and found many positive indicators. In this current environment, **we prefer to own large-caps and mid growth software companies in high growth subsectors.**

The recent correction of -29% in the software sector is already greater and lasted longer than an average correction[1] (Diagram 1). Based on history, we are either close to or have reached the bottom. Only in the most extreme case of the 2000 Tech bubble burst did we see a significantly greater drawdown than the present correction.

Diagram 1: Market correction today is already larger and longer than an average correction

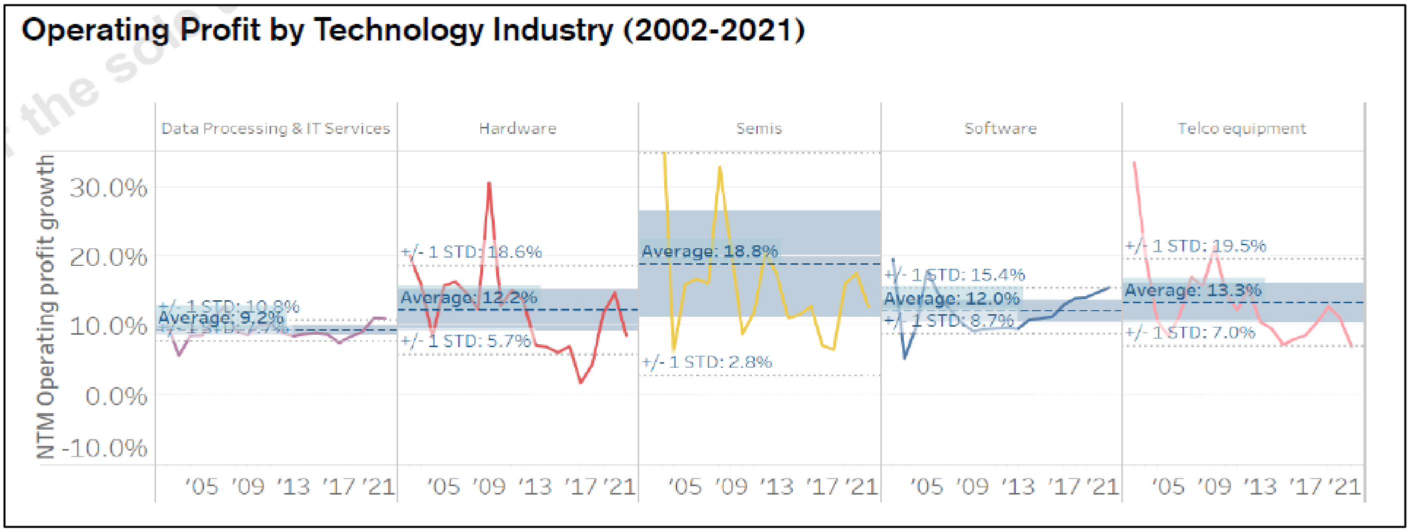
Market Correction since 2000			Index Performance		
Start	**Trough**	**Length in Days**	**Software Index**	**S&P 500**	**Nasdaq**
10-Mar-00	14-Apr-00	35	-42%	-3%	-34%
1-Sep-00	4-Apr-01	215	-49%	-28%	-61%
20-Jan-04	12-Aug-04	205	-26%	7%	-18%
5-May-06	21-Jul-06	77	-16%	-6%	-14%
31-Oct-07	22-Jan-08	83	-21%	-15%	-20%
7-Jul-11	3-Oct-11	88	-28%	-19%	-19%
5-Mar-14	8-May-14	64	-19%	0%	-7%
23-Jun-15	29-Sep-15	98	-17%	-11%	-13%
1-Dec-15	9-Feb-16	70	-26%	-12%	-17%
14-Sep-18	24-Dec-18	101	-21%	-19%	-23%
2-Feb-20	18-Mar-20	45	-36%	-29%	-29%
12-Feb-21	13-May-21	90	-19%	5%	-7%
Average		**98**	**-27%**	**-11%**	**-22%**
12-Nov-21	**Ongoing**	**116**	**-29%**	**-12%**	**-19%**

Source: J.P. Morgan

[1] We define a correction as a fall of >15% for Software Index in any 12-month window from its last peak. The software index has corrected 13 times since 2000.

Software remains an attractive core holding within technology. Due to its SaaS recurring revenue business model, software profitability is less volatile than other tech sectors such as hardware and semiconductors (Diagram 2).

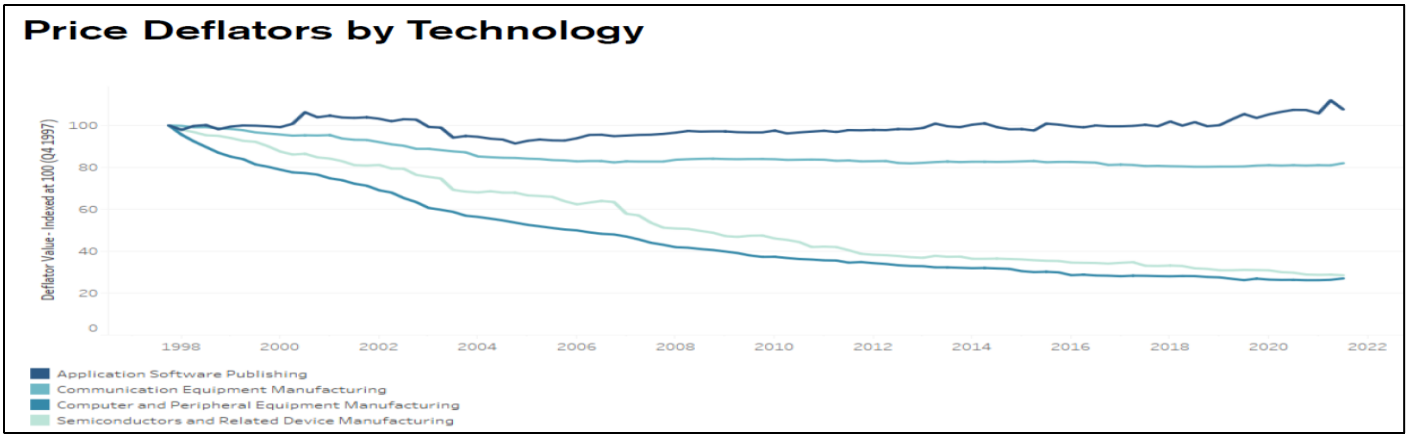
Diagram 2: Software profitability has low volatility



Source: Credit Suisse

There are several reasons for this stability. First, software companies can maintain their long-term pricing power better unlike other technology sectors such as hardware and semiconductors which experiences continuous price pressure. Software prices have kept up with inflation while other tech products such as hardware and semiconductors have become cheaper over time (Diagram 3). Software companies have also demonstrated their ability to maintain their high growth trajectory far longer than the other technology sectors. Over the past 20 years, software on average maintains ~85% of its previous year's growth rate[2], which is the highest among the technology sectors.

Diagram 3: Software maintains pricing power

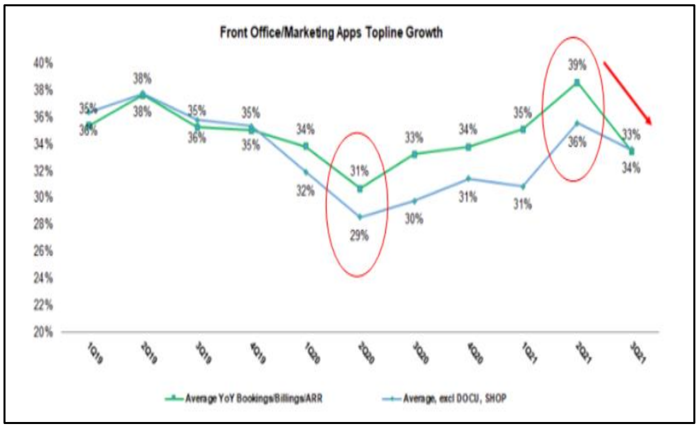


Source: Credit Suisse, US Bureau of Economic Analysis

[2] based on Credit Suisse's piece "#SoftwareIsLife", Nov 16 2021

Going into 2022, we believe that software spending will increase even as doubts are cast on other sectors like consumer discretionary spending because of rising inflation. As discussed previously, software can maintain its pricing power even after adjusting for inflation. On the demand side, large enterprises still have long runways for digital transformation and will continue accelerating IT spending in 2022. A survey done by Morgan Stanley showed that CIOs expects software spending to accelerate, from 4.9% growth in 2021 to 5.2% in 2022. On a two-year basis, Front Office software billings growth remain consistently steady at ~33% CAGR every single quarter when we adjust for 2Q21 Covid-19 effect of pulling in of demand (Diagram 4). The last quarter's software revenue also beat expectations by 3.5% (Diagram 5), which is higher than a historical average beat of ~2-3%[3]. These are signs that software spending is accelerating, not slowing.

Diagram 4: Front Office Software growth steady



Source: Morgan Stanley

Diagram 5: Large beat of expectations in 4Q'21

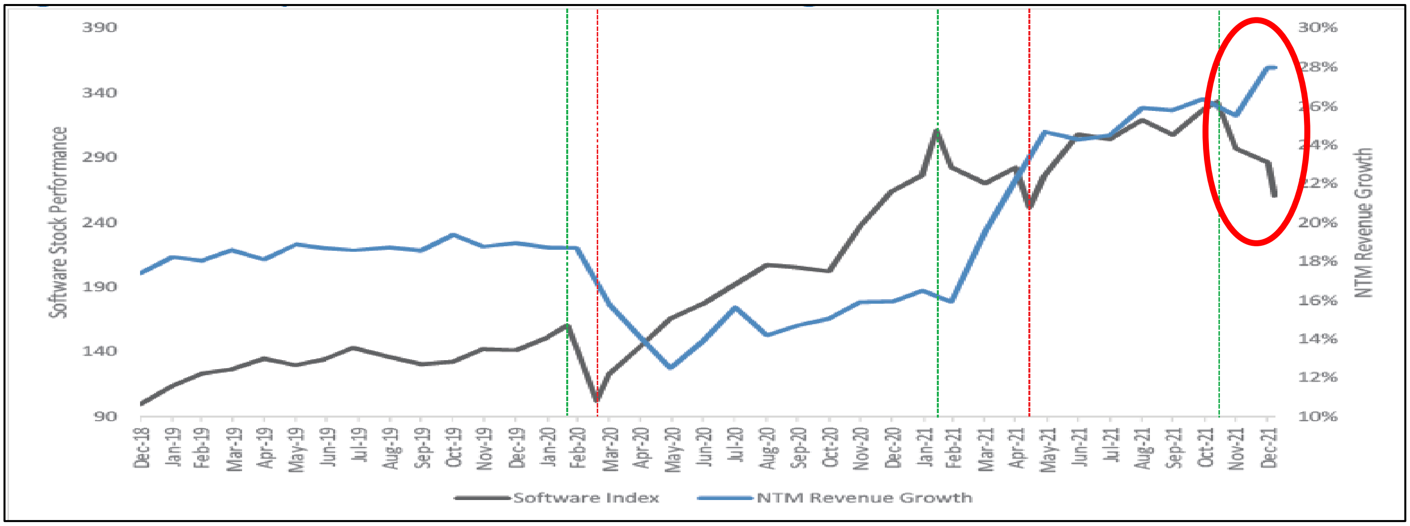
	Last quarter ended	Sales surprise, 4Q
TEAM US Equity	27 Jan 2022	7.18%
ZEN US Equity	10 Feb 2022	1.46%
XM US Equity	26 Jan 2022	6.14%
MSFT US Equity	25 Jan 2022	1.68%
SAP GY Equity	27 Jan 2022	3.34%
PLTR US Equity	17 Feb 2022	3.23%
NOW US Equity	26 Jan 2022	1.58%
Average		**3.52%**

Source: Bloomberg

Over the longer-term, stock prices and fundamentals should converge and this current episode of divergence presents an interesting buy opportunity. Stock prices of software companies are falling even as growth estimates continue to increase (Diagram 6). This effect is most apparent in the high growth software companies. Over the past year, high growth software had their revenue revised upwards the most, but multiples contracted the most and overshadowed this fact (Diagram 7). This confirms our view that prices are not declining due to fundamentals. Prices are declining entirely due to rising interest rates.

[3] based on Credit Suisse's piece "#SoftwareIsLife", Nov 16 2021

Diagram 6: Divergence between prices and revenue growth estimates



Source: J.P. Morgan

Diagram 7: Divergence between prices and revenue growth estimates for high growth software

NTM EV/Revenue Multiple as of 12/31/20	NTM EV/Revenue Multiples			Revenue Estimate Revisions	
	12/31/20	11/12/21	% Δ	2021	2022
>20x	27.9x	23.6x	-15.3%	10.7%	13.1%
15-20x	16.8x	16.1x	-3.8%	5.5%	5.8%
10-15x	11.4x	11.5x	1.0%	3.3%	3.9%
7-10x	8.0x	9.4x	17.2%	6.2%	8.9%
5-7x	5.7x	5.8x	2.8%	2.8%	3.8%
<5x	3.7x	4.5x	20.9%	1.8%	1.4%

Source: Credit Suisse

We argue that the current valuation is fair even after adjusting for rising interest rates. While interest rates do have a large impact on this sector as they are long-duration equities[4] their valuations have already adjusted for this. Today's 10 Year Treasury rate of 2.0% is in the middle of the 2019 range of 1.5% to 2.6% (Diagram 8). Assuming the bond market is correct, valuations should be trading at similar multiples as 2019. Indeed, this is the case. Today, software sector is trading at 9.8x Enterprise Value("EV")/Next Twelve Months("NTM") Revenue vs. 9.6x in 2019, 32.2x EV/NTM EBITDA vs. 33.7x in 2019 and 52.2x P/NTM E vs. 55.8x in 2019 (Diagram 8). Fundamentals such as growth rates and margins today are slightly better than in 2019. Sector's NTM Revenue growth is 21.8% today vs 21.8% in 2019, and NTM EBITDA margin is 33.2% vs. 30.7% in 2019 (Diagram 8).

[4] i.e., the bulk of software companies' free cash flows will be produced far into the future

Diagram 8: Software today is as cheap as 2019 and fundamentally better than 2019

Top 10 software companies[5]	2019 average	March 8, 2022
NTM Revenue growth YoY	21.8%	21.8%
NTM EBITDA margin	30.7%	33.2%
NTM ROE	51.3%	146.7%
EV/NTM Revenue	9.6x	9.8x
EV/NTM EBITDA	33.7x	32.2x
P/NTM Earnings	55.8x	52.2x
10 Year Treasury rates	~1.5-2.6%	2.0%

Source: Bloomberg

Which software categories should one be focusing on? After establishing that the software industry today is a good buy, the next question is which software group to focus on? Large versus Small-cap, High versus Low growth, and which sub-segment of software?

We favour large-cap software stocks. In a correction, large-cap software performs better. Based on a J.P. Morgan study, in the 13 corrections since 2020, the top 10 software most affected were mostly small-cap while the top 10 software least affected were mostly large-cap. During a correction, investors prioritise the growth attainability, cash flow predictability and high margins of large-cap software. During a recovery, small caps must beat sales consensus by >5% to outperform large caps. Small caps that only perform in line with sales consensus continue to trail large caps even during the recovery. Therefore, whether we are in the middle or near the end of the correction, large-cap is a better risk-reward bet. We prefer owning large-cap software in general, unless we hold very high conviction that a small-cap software company will outperform expectations.

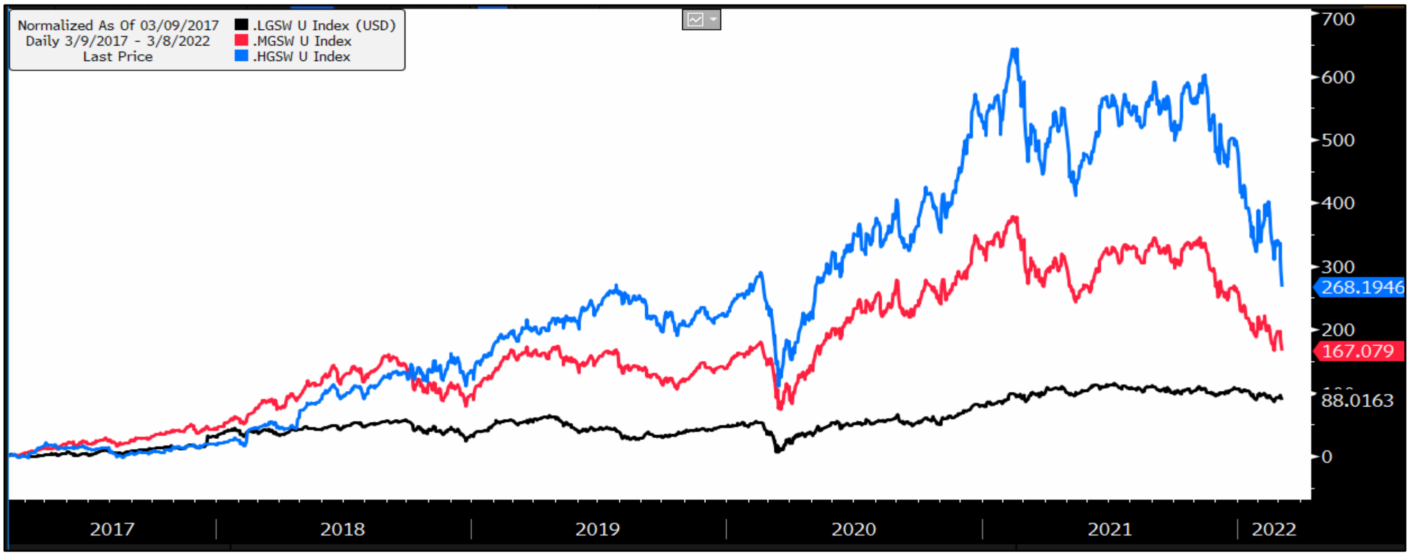
The better price performance of large caps is supported by industry fundamentals that encourage "Winner Takes All". Firstly, data itself is a positive feedback loop. The more functionality a software company can provide to its customers and partners, the more customers and partners it will have. These customers and partners will provide it with more user data, which then allows it to build more functionalities. Secondly, large software companies offer Platform solutions (suite of bundled software), which allow it to penetrate further into an organisation and benefit from CIOs consolidating IT spend. For a smaller software company to compete in the same space, they must be a Best of Breed in their niche. Thirdly, smaller companies also have uphill challenges affording fixed overhead,

[5] The software index is an equal-weighted basket of 10 mega-cap software companies: Microsoft, Salesforce, ServiceNow, Workday, Palo Alto Networks, Intuit, Atlassian, Autodesk, and VMware. These software companies were already among the largest since 2019 and have continued their dominance up till today. This is due to the structural "Winner takes All" nature in the software industry.

attracting software talent, and paying for rising engineer wages. Lastly, even when a small-cap succeeds in dominating a niche, large caps will take notice of the financial viability of that niche and promptly enter the fray. For example, Microsoft pivoted heavily to Teams once Slack and Zoom proved the viability of collaboration software, taking market share away from them. The fact that software companies ranked by market cap have not changed that much over the past 3 years affirms this "Winner Takes All" view.

Even among large-cap software, we prefer medium growth[6] large-caps as their long-term price performance are significantly better than low growth large caps (Diagram 9). It is difficult to find large caps with high growth. Furthermore, medium growth software prices have already significantly retraced in the past 12 months by -28%, almost as much as high growth software which retracted by -35%, creating attractive buying opportunities.

Diagram 9: Higher growth software are more volatile, but performs better in the long term

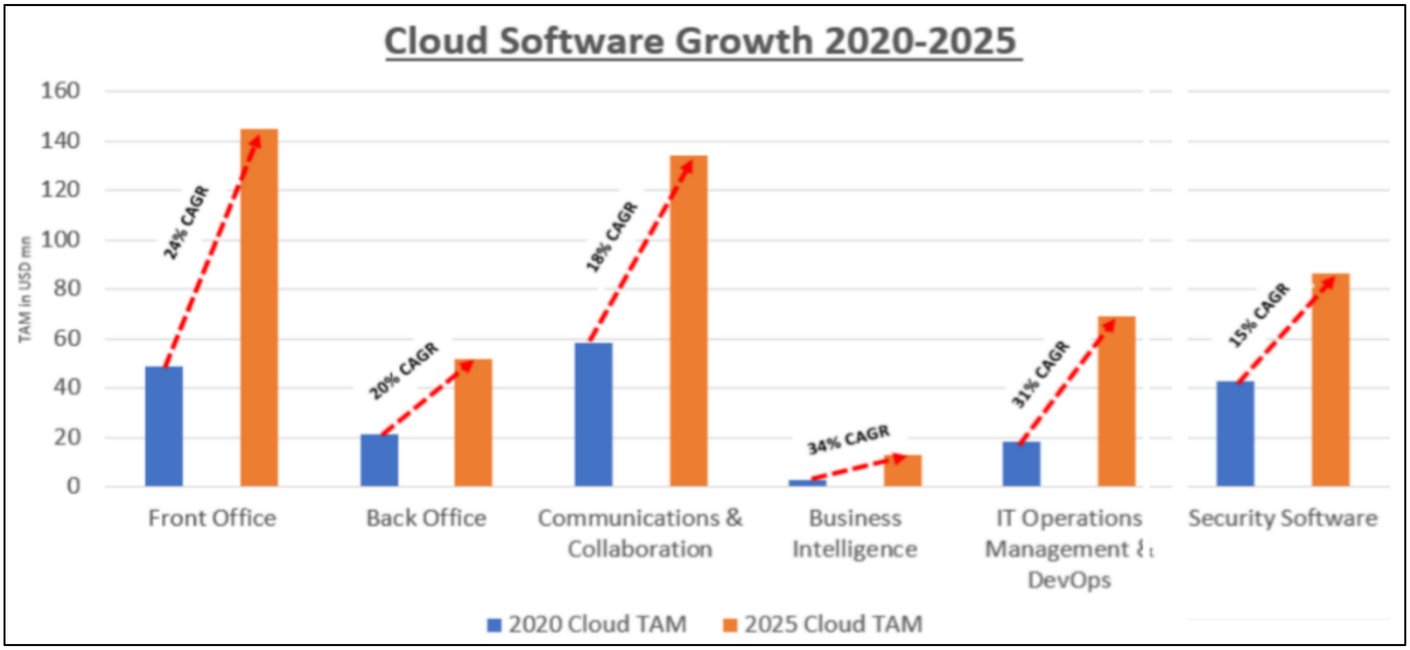


Source: Bloomberg

Among the 6 major software subsectors[7], we prefer Front Office, Business Intelligence, and IT Management as they are expected to grow the fastest (Diagram 10). Software companies' growth is predicated on two factors: (1) how fast their subsegment is growing, and (2) whether they are gaining or losing market share within that subsegment. All other things equal, it is easier for a software company operating in a high growth subsegment to grow faster. As shown in Diagram 9 above, high growth loosely translates to better long term stock price performance.

[6] We define low growth software as <15% 2Y Forward Revenue CAGR, medium growth as 15-30% 2Y Forward Revenue CAGR, and high growth as >30% 2Y Forward Revenue CAGR. We grouped our software universe into these 3 groups and created 3 indices.
[7] Cloud Application Software can be loosely classified into 6 different subsectors by IDC: Front Office applications (e.g., sales, marketing, ecommerce, go-to-market intelligence, customer service, enterprise content management), Back Office applications (e.g., human capital management, finance, travel and expense, supply chain), Communications applications (e.g., unified communications, call centres, office productivity, project management, desktop as a service), Business Intelligence (e.g., data storage, data analysis), IT Management software (e.g., Apps performance, IT service management, project management, app development) and Cybersecurity software.

Diagram 10: IT spending on Front office apps, Analytics and DevOps will grow faster



Source: Goldman Sachs, IDC, Gartner

Even within the 3 favoured subsectors, we prefer concentrating in certain growth areas. In Front Office applications, we like customer experience analytics as it is the natural evolution of Customer Relationship Management ("CRM") and has the potential to capture market share from an already existing huge CRM Total Addressable Market. We are waiting for Qualtrics to reduce its share-based compensation as a % of sales, and to move its revenue mix away from online surveys. In Analytics, we like Data Cloud plays as they benefit from Enterprises centralising both structured and unstructured data within the cloud and the increasing proliferation of cloud-based apps. We are waiting for better sales efficiency from Snowflake and Confluent. In IT Management, we like ServiceNow as it occupies a rare position as both a Best-of-Breed in workflow automation and a Platform offering modular solutions with almost unlimited use cases.

While the other 3 subsectors do not grow as fast, we still identify some high potential areas that may be interesting for investors. In Collaboration, we are growing increasingly confident in the Metaverse theme with each additional commitment made by the mega-cap tech companies and F500 companies. Unity is a good pick-and-shovels metaverse play, but we are waiting for a subscription price increase of Unity Engine to create a viable path to profitability for the company. In Cloud Security, the three high growth pure-play cloud software seems interesting. ZScaler, Crowdstrike and Okta are Best-of-Breed in their security subsegments, consistently beating revenue growth consensus, capturing market share from legacy incumbents, and are now trading at much more reasonable valuations than before.

In conclusion, we favour large-caps and mid growth software companies in high growth subsectors. We think we are closer to the end of the pullback, but no matter where we are, we still generally prefer to own companies with such profiles. We have also dispelled current top-of-mind investor concerns such as interest rate hikes and a pull-forward in Enterprise IT spending. In terms of timing, we prefer to add exposure both now, and going into 2H'2022 as Q3'2022 will provide easier year-on-year comparisons.

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Risk Disclosure