Citi Research

VIEWPOINT

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# Global Equities

## Supply Chain Champions: Macro to Micro

Global Context

**CITI'S TAKE**

In this report we go from *'macro to micro'*, and consider a thorny subject, namely some of the implications for stocks globally of ongoing global Supply Chain disruption. We do so alongside Citi's *Global Perspectives & Solutions* report (LINK) published on this complex topic. The Citi GPS report argues that *'firms are likely to take steps toward increasing the size of their inventories and simplifying the structure of their supply chains. The open question is how vigorous and widespread such efforts will ultimately be'*. In this Investor-focused report we seek to address a key question for Investors, across Super Sectors: which companies should be considered 'part of the solution' to these challenges? Read on for our Fundamental Analysts' thoughts, as well as some Corporates who are perhaps less well positioned – as well as a Quantitative Thematic lens to tackling this question.

**Industrial Tech & Mobility —** Our Industrial Tech & Mobility teams have a plethora of companies who are deeply in involved in advanced Supply Chain solutions. In Europe they highlight Kion, Auto Store, Hapag Lloyd, Maersk, ZIM, Deutsche Post DHL; in Asia it is Shenzhou, Techtronic, Ashok Leyland, Mahindra & Mahindra, Cosco Shipping, Yang Ming Marine, International Container Services Terminal, and Westports; and in the Americas they hone in on Rockwell Automation, Honeywell, Aecom, Jacobs Engineering, CSX, Northern Southern, JB Hunt, and Traxion.

**Technology & Communications —** It goes without saying that Tech & Comms plays an important role in Supply Chains. Within Asia, our teams focus on TSMC, JD Logistics, WiseTech, and LG Innotek; in Europe the standout is software behemoth SAP; in North America there is a phalanx of leading companies, including Jabil, Markforged, Kornit Digital, Arrow, Avent, CDW, Synnex, and Oracle. Of particular note is how the EMS, 3D & Graphic Printing, & Distributors subsectors benefit from continued supply chain disruption/challenges as customers invest more in risk mitigation strategies and geographic diversification.

**Real Estate —** Noting the seemingly inexorable rise of e-commerce (clearly predating the pandemic but irrefutably accelerated materially by it), across the vast swathe of Real Estate and REITs that Citi Research covers, where many companies own and develop logistics real estate across multiple countries, our teams zero in on a cohort of Corporates at the leading edge of Supply Chain solutions. In Europe they pick out SEGRO; in the Americas they compare and contrast Prologis, Duke Realty, and Rexford Industrial Realty; whilst in Asia it is leading companies GLP J-REIT and Goodman which are cast in the limelight.

**Consumer Technology, Consumer Wellness —** Citi Consumer analysts highlight two companies in this space, including in the Americas, Gildan. Gildan is typically known as the low cost provider of their products (blank T-shirts, sweatshirts, polos), as their Honduras-based manufacturing operations give them an even greater advantage given current market dynamics vs Asia-based competitors. In Europe, they shine a light on the largest retail market globally, Grocery, and the investment case for leading light Ocado, whose proprietary Solutions business enables their partners to get to a leading position in online grocery, by providing robotic and software solutions that enable profitable and scalable growth.

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**See Appendix A-1 for Analyst Certification, Important Disclosures and Research Analyst Affiliations.**

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# Executive Summary

## Global Supply Chain Disruptions – *Equity Implications*

Citi Chief Economist Nathan Sheets reminds us in this Citi *Global Perspectives & Solutions* report GLOBAL SUPPLY CHAINS:The Complicated Road Back to "Normal" that

> "*global supply chain disruptions have emerged as a significant, and unforeseen, challenge. These disruptions have cascaded with surprising speed and power to countries around the world.*"

The report goes on to observe that:

> "*the balance of the data suggests that supply-chain pressures are now at a point where they have stopped getting worse. But, to date, the evidence also doesn't manifest any convincing improvement*".

The report concludes by observing a more pressing issue, indeed

> *"deeper issue that firms will be wrestling with in the aftermath of the pandemic, as regards the appropriate strategies for supply-chain and inventory management. The recent experience has highlighted marked vulnerabilities in the strategies that prevailed in the years before the pandemic—and firms are likely to take steps toward increasing the size of their inventories and simplifying the structure of their supply chains. The open question is how vigorous and widespread such efforts will ultimately be".*

How vigorous and widespread indeed will such efforts be?

It is set against the backdrop of this critical challenge that we decided to poll our 250 Fundamental Analysts around the world, across the regions, in an attempt to build a better picture of the types of companies who may be increasingly identified as being 'part of the solution' to the medley of Supply Chain problems.

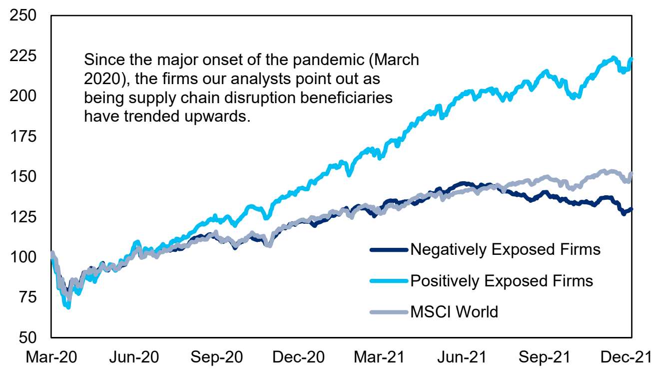
Whilst by no means representing an exhaustive list, our coverage Analysts spanning a number of Super Sectors – *Industrial Tech & Mobility, Real Estate, Technology & Communications, Consumer Wellness, Consumer Tech etc* - explain how and why their highlighted companies can help other Corporates across a gamut of areas, as they seek increasingly to automate, digitize, process, arrange, sort, and advise others on how to achieve - and improve upon - world-class, more robust, more resilient Supply Chain management – as well as some that are less well positioned.

Leading companies highlighted include Automation and Robotics leaders such as AutoStore, Ocado, SMC, Rockwell, Kion; Real Estate logistics leaders such as Duke Realty, Goodman Group, GLP J-REIT, SEGRO; Transportation front-line companies such as Mahindra & Mahindra, Hapag Lloyd, ZIM, CSX, UNP; Technology vanguard companies such as JD Logistics in China, global EMS distributors such as Avnet, 3D printing machine technology companies such as Markforged Holding Corp, and in the Software Logistics realm behemoths such as SAP, Oracle, to name but a few.

In addition to these Fundamental perspectives, Citi's Quantitative Research team discuss the landscape of Supply Chains from the data-driven perspective, both in terms of availability of datasets (spoiler alert: it's not easy), as well as those often seemingly intractable questions which investors are likely to increasingly explore and implications for those running broad portfolios.

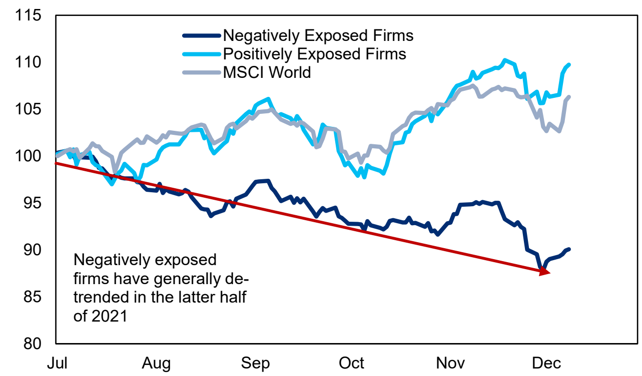
As Figure 1 & 2 show, those companies which our analysts have identified as being positive enablers of Supply Chain Management globally have as a basket since March 2020 materially outperformed the benchmark (+123% vs benchmark at +52%) and also versus a basket of negatively exposed stocks (which is +30% over the same time period). Whilst less pronounced, the performance trends are similar if measuring since the start of July 2021 (positive basket +10%, benchmark +6%, negative basket -10%). This is a topic that is highly likely to rumble on in significance well through 2022.

**Figure 1. Supply Chain Disruption Beneficiaries have Trended Upwards**




Source: Citi Research

**Figure 2. Negatively Exposed Firms have De-trended in the Latter Half of 2021**




Source: Citi Research

For further work on related topics please see our prior research here:

- Global Multi-Asset: Digital Disruption – Pandemic Rubicon Crossed: Highlighting Key Investable Ideas & Themes & Global Theme Machine: A Thematic Perspective on COVID-19 and Globalisation.

We hope you enjoy this report.

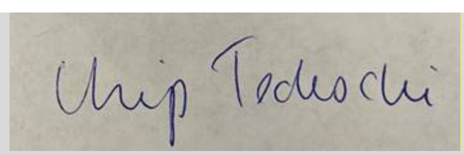


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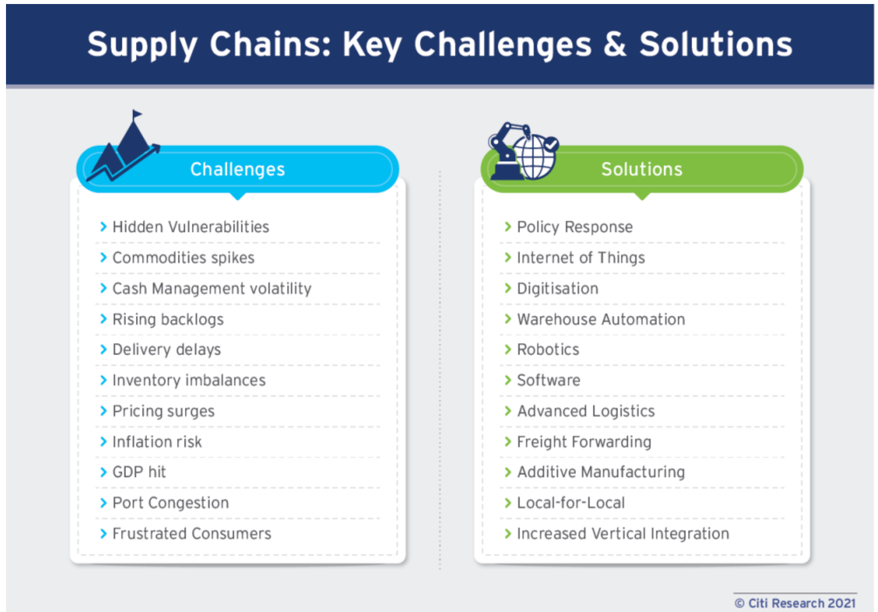
**Figure 3. Supply Chains: Key Challenges & Solutions**




Source: Citi Research

# Quantitative Insights

# Quantitative Analysis: A Top- Down Perspective

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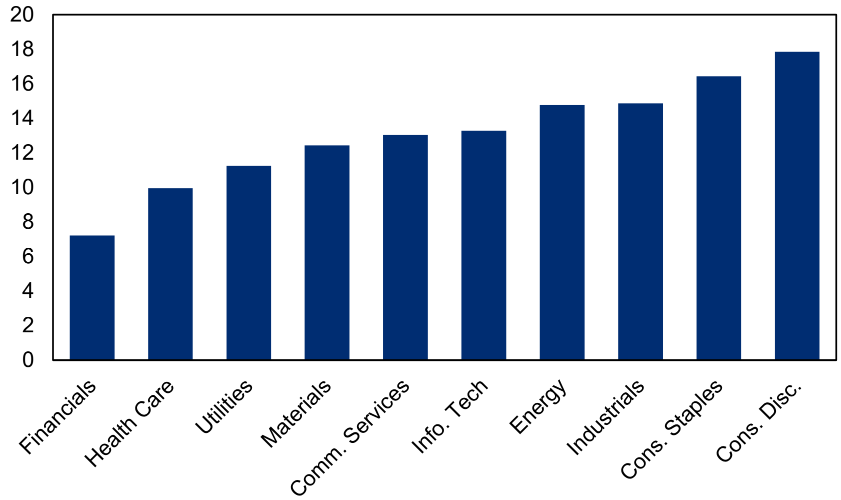
Before we present the bottom-up equity implications of supply chain disruptions via the views and expertise of our Fundamental analysts, we first provide a more top-down perspective on supply chain issue solution providers and supply chain complexities. Admittedly, it's challenging to take a purely quantitative view on the ripple effect of supply chain bottlenecks since the effects are non-linear and the networks connecting firms can be multiple layers deep. To add to that, supply chains are dynamic and constantly evolving with the economic environment. On the one hand, we've seen firms becoming more connected with each other, particularly through the wide-spread use of tech and the simplification and cost reduction in travel and transportation. On the other hand, we've also observed a gradual decline in globalization which has its pros but also its cons.

One of the driving forces behind the de-globalization trend was, in fact, a simplification of supply chains and logistics. As we noted in Global Theme Machine - A Thematic Perspective on COVID-19 and Globalisation, the pandemic strengthened de-globalization momentum and created new trends such as limiting labour mobility. This, as we now know, has contributed to the existing problem we're now facing with supply chain headwinds and reduced labour participation. We also argued in that same note that 'bringing supply chains home' may not be the best solution. For some corporates, the optimal solution is to move to the destination market where the product is being demanded whereas for others the optimal decision may require taking renewed labour mobility limitations into account given that it may be harder to obtain visas. In this case, the optimal choice involves deciding whether activities are moved to where the labour is, or whether the labour continues to move to where the activity is. These shifts, if they do happen, will take time however. In the short to medium term, it's insightful to know where the supply chain complexities exists.

Leveraging the supply-customer dataset provided by Bloomberg, we look at the average number of suppliers for stocks in each sector.

**Figure 4. Average Number of Suppliers for Stocks in Each Sector**




Source: Citi Research, Bloomberg

Not surprisingly, we find that Consumer Staples and Consumer Discretionary firms tend to have more firms supplying products to them and could therefore be at more risk going forward if supply chain issues persist. On the other end of the spectrum we have Financials and Healthcare firms.

In Figure 5, reading from left to right, we show the sector breakdown of suppliers to each sector (on the right hand-side). For example, the top row tells us that, on average, 29% of suppliers to Communication Services firms belong to the same sector whereas, on average, 14% of the suppliers to Communication Services firms belong to the Consumer Discretionary sector and so on. Ultimately, what the chart provides, is an average picture of the breadth of suppliers to firms in each sector.

**Figure 5. Firm Sector & Supply Sector Overview**

| Firm Sector / Supplier Sector | Comm. Services | Cons. Disc. | Cons. Staples | Energy | Financials | Health Care | Industrials | Info. Tech | Materials | Utilities |
|---|---|---|---|---|---|---|---|---|---|---|
| Comm. Services | 29% | 14% | 4% | 0% | 6% | 2% | 7% | 36% | 1% | 1% |
| Cons. Disc. | 5% | 38% | 5% | 1% | 5% | 1% | 16% | 18% | 7% | 5% |
| Cons. Staples | 4% | 13% | 37% | 0% | 4% | 4% | 9% | 8% | 9% | 10% |
| Energy | 1% | 4% | 1% | 36% | 1% | 0% | 25% | 7% | 14% | 10% |
| Financials | 6% | 18% | 5% | 1% | 15% | 3% | 17% | 30% | 3% | 2% |
| Health Care | 2% | 2% | 4% | 0% | 2% | 56% | 6% | 11% | 5% | 12% |
| Industrials | 2% | 14% | 2% | 4% | 3% | 1% | 36% | 16% | 8% | 14% |
| Info. Tech | 8% | 10% | 2% | 1% | 6% | 3% | 12% | 51% | 3% | 4% |
| Materials | 1% | 10% | 6% | 5% | 2% | 2% | 21% | 8% | 26% | 21% |
| Utilities | 1% | 11% | 9% | 5% | 1% | 8% | 33% | 12% | 17% | 4% |

Source: Citi Research

Sector to sector, we tend to find most suppliers belong to the same sector as the firms they're supplying to. Those sectors with more varied suppliers include Utilities, Financials and Communication Services. We also find that IT firms supply to a wider set of firms across the sector spectrum.

Several themes within Citi's Global Theme Machine can be viewed as being resilient to supply chain issues (we list these in Figure 8. below along with their definitions). For example, **Manufacturing Onshoring** is a theme focused on highlighting stocks positively exposed to US onshoring trends. The introduction of this theme was motivated by the fact that offshoring has become more expensive due to wages rising in emerging market countries and logistics becoming more challenging. Our collection of internet-focused themes (**Internet-driven Business Models** and **Cloud Computing**) will also capture firms relatively better able to look through supply chain bottlenecks. We also consider a few of our more tech themes which rely less on complicated and lengthy supply chains and/or large labour forces; **Artificial Intelligence, 3D Printing/Additive Manufacturing** and **Automation/Robotics** are included here. Lastly, the theme **Recurring Revenue/Low Risk of Disruption** highlights companies with higher barriers to entry and consistent revenue streams which are less sensitive to swings in economic events. We can view the underlying motive of this last theme as a different perspective on pricing power.

**Figure 6. Theme Definitions**

| Theme | Description |
|---|---|
| 3D Printing/Additive Manufacturing | This Theme is driven by the growth in 3D Printing, or additive manufacturing. Having produced a digital model using a CAD program, the model is divided into thousands of layers which are sent to the printer to build the model layer by layer. 3D Printing has the potential to rewrite the rules of global manufacturing and be as significant to the industrial sector as lean manufacturing. This theme seeks to highlight companies exposed to the growth of 3D Printing. |
| Automation/Robotics | This Theme is driven by the growth of robots and automation within manufacturing. Japan leads the world in factory automation, partly driven by a fall in the working age population, but many other countries face similar demographic challenges ahead. Rising wages in china and the search for productivity improvements are also driving a substitution from labour to machines. This theme seeks to highlight companies positively exposed to factory automation trends. |
| Manufacturing Onshoring | This Theme is driven by a new trend to Onshoring or restoring manufacturing back to the US. The growth in wages in emerging markets, increased costs of transportation, and concerns over IP protection are among contributing factors, but the Shale boom in the US is also benefiting the cost competitive of a number of US industries. This theme seeks to highlight companies positively exposed to US onshoring trends. |
| Artificial Intelligence | This theme is driven by the development of computing technology being able to perform tasks typically requiring human intelligence, such as speech recognition, visualisation, decision-making, translation between languages and automated categorisation. The theme seeks to highlight companies positively exposed to advancement & applications in this field |
| Cloud Computing | This Theme is driven by the growth in both consumer and enterprise cloud services. Cloud usage in the consumer segment has been driven by media streaming and access to cloud storage. On the enterprise side, clients are seeing a need to provide access to large data archives. Cloud adoption has started to become more mainstream and companies exposed stand to benefit from this growth. |
| Internet-driven business models | This Theme is driven by continued growth in Internet adoption and broadband speeds. The Internet continues to transform many industries, acting as both an opportunity and a threat. This theme looks for Companies positively exposed to this growth. |
| Recurring Revenue/Low Risk of Disruption | The theme is to capture companies that have recurring revenue greater than 10% (10 – 50% medium vs > 50% high exposure thresholds) and are thought to have higher barriers to entry, thus lower risk of disruption. |

Source: Citi Research

These themes are currently ranked at the more expensive end of the Value spectrum although Manufacturing Onshoring is the most "Value" theme of all those we're considering as well as being ranked relatively high from a Quality perspective. Not surprisingly, Cloud Computing is the most Growth theme. For an overview of the fundamental attractiveness of these themes, Figure 7 presents where the themes rank (amongst the 87 themes in our Global Theme Machine) according to several fundamental characteristics; a theme which ranks number 1 on Valuation is the cheapest whereas a rank of 87 indicates it's the most "expensive" theme. What the table shows is that, currently, the themes described above in Figure 6 are currently ranked at the more expensive end of the Value spectrum although Manufacturing Onshoring is the most "Value" theme of all those we're considering as well as being ranked relatively high from a Quality perspective. Not surprisingly, Cloud Computing is the most Growth theme.

**Figure 7. Theme Attractiveness**

| Portfolio | Overall | | Overall excluding Price Momentum | Valuation | | Growth | | Price Momentum | | Quality | | Low Risk | | Earnings Momentum | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MSCI World | 4 | ( 2) | 9 | 80 | (77) | 21 | (19) | 2 | ( 2) | 3 | ( 3) | 17 | (17) | 22 | (12) |
| Manufacturing Onshoring | 5 | ( 4) | 4 | 17 | (17) | 31 | (43) | 24 | ( 9) | 9 | (13) | 42 | (42) | 26 | (21) |
| Cyber Security | 7 | (12) | 10 | 46 | (44) | 24 | (26) | 8 | (14) | 47 | (50) | 24 | (24) | 8 | (30) |
| Artificial Intelligence | 12 | (13) | 19 | 70 | (71) | 10 | ( 9) | 12 | (13) | 35 | (22) | 29 | (26) | 36 | (49) |
| Cloud Computing | 18 | (38) | 22 | 77 | (76) | 5 | ( 5) | 21 | (31) | 75 | (64) | 14 | (15) | 16 | (64) |
| 3D Printing/Additive Manufacturing | 45 | (56) | 54 | 58 | (63) | 47 | (60) | 32 | ( 8) | 48 | (74) | 66 | (65) | 15 | ( 8) |
| Recurring Revenue/Low Risk of Disruption | 49 | (58) | 49 | 63 | (61) | 49 | (44) | 42 | (52) | 55 | (47) | 16 | (16) | 46 | (67) |
| Automation/Robotics | 57 | (25) | 67 | 53 | (49) | 40 | (35) | 40 | (23) | 28 | (36) | 64 | (67) | 66 | (18) |

Source: Citi Research

Of the stocks selected by our analysts as supply chain solution providers (provided later in this report), several have exposures to those themes resilient to supply chain issues. In Figure 8 below, we provide the exposure mappings of these stocks to the themes discussed above; 'High' indicates a stocks' revenue exposure to a theme is above 50%, 'Med' means a stocks' revenue exposure approximately lies between 10-50% and 'Low' means their exposure is below 10%. These exposure ratings are based on the latest constituents and mappings from our Global Theme Machine which was last rebalanced early in 2021.

**Figure 8. Resilient Theme Exposures**

| Company Name | SEDOL | ISIN | 3D Printing / Additive Manufacturing | Artificial Intelligence | Automation / Robotics | Cloud Computing | Internet-driven business models | Manufacturing Onshoring | Recurring Revenue / Low Risk of Disruption |
|---|---|---|---|---|---|---|---|---|---|
| A.P. Møller - Mærsk | 4253048 | DK0010244508 | Med | Med | Med | Low | Med | High | - |
| Arrow Electronics Inc | 2051404 | US0427351004 | - | Low | Low | Low | - | Low | - |
| Avnet Inc | 2066505 | US0538071038 | - | Low | Low | - | - | Low | - |
| CDW Corp | BBM5MD6 | US12514G1085 | - | - | - | Low | - | - | - |
| CSX Corp. | 2160753 | US1264081035 | - | - | - | - | - | Med | - |
| Deutsche Post | 4617859 | DE0005552004 | Low | - | - | - | - | - | Med |
| Gildan Activewear Inc. | 2254645 | CA3759161035 | - | - | Low | - | - | - | - |
| Hapag Lloyd AG | BYZTSW7 | DE000HLAG475 | Med | Med | Med | Low | Med | High | - |
| Honeywell International Inc. | 2020459 | US4385161066 | - | - | Med | - | - | - | Med |
| Jabil Inc | 2471789 | US4663131039 | - | Low | - | - | - | - | - |
| KION Group | BB22L96 | DE000KGX8881 | - | - | High | - | - | - | - |
| Kornit Digital | BWFRFD7 | IL0011216723 | - | - | High | - | Low | Med | - |
| LG Innotek | B39Z8G8 | KR7011070000 | - | - | - | - | Med | - | - |
| Norfolk Southern Corp. | 2641894 | US6558441084 | - | - | - | - | - | Low | - |
| Oracle Corporation | 2661568 | US68389X1054 | - | Low | - | Med | Med | - | High |
| Prologis Inc | B44WZD7 | US74340W1036 | - | - | - | - | - | Low | - |
| Rockwell Automation | 2754060 | US7739031091 | - | - | High | - | - | - | - |
| SAP SE | 4846288 | DE0007164600 | - | Low | Low | Med | Med | - | High |
| SEGRO | B5ZN1N8 | GB00B5ZN1N88 | - | - | - | - | - | - | High |
| SMC | 6763965 | JP3162600005 | - | - | High | - | - | - | - |
| Synnex Corp | 2002554 | US87162W1009 | - | Med | - | Low | - | - | - |
| Techtronic | B0190C7 | HK0669013440 | - | - | - | - | - | High | - |
| Traxion | BF4GP25 | MX01TR0H0006 | - | - | - | - | - | Low | - |
| TSMC | 6889106 | TW0002330008 | Low | Med | Med | Med | - | High | High |
| Union Pacific Corp. | 2914734 | US9078181081 | - | - | - | - | - | Med | - |
| WiseTech Global | BZ8GX83 | AU000000WTC3 | - | Low | Low | High | High | Low | High |

Source: Citi Research

In particular, three of these companies have revenue exposures to multiple themes including WiseTech Global, TSMC, SAP, Hapag Lloyd and A.P. Møller – Mærsk.

On the flip side, those firms highlighted by our analysts as not being relatively capable of weathering supply chain bottlenecks tend to not have any exposure to these themes; where they do, it's because they sell products online so therefore have some revenue exposure to themes **Internet-driven Business Model** and **Cloud Computing**. Fewer of those firms flagged negatively have any exposure to the Recurring Revenue theme though two do: Coloplast and Convatec.

# Equity Views

**Figure 9. Potential Beneficiaries of Supply Chain Disruption**

| Company Name | RIC | ETR | Rating | Price | TP | Curr | Analyst | Company Description |
|---|---|---|---|---|---|---|---|---|
| A.P. Møller - Mærsk A/S | MAERSKb.CO | 28.5% | 1 | 21400 | 25000 | DKK | Sathish B Sivakumar | A.P. Moller-Maersk is an integrated transport and logistics company mainly in container sector. Maersk owns and operates container ships, ports and freight carriers. Maersk offers both port-to-port services and door-to-door services through intermodal operations. Maersk currently generates c.75% of revenue from Ocean services and is looking to diversify into a broader supply chain through integrated logistics offering both organic and M&A opportunities. Maersk is headquartered in Copenhagen with global operations. |
| Aecom | ACM.N | 15.5% | 1 | 73.6 | 85 | USD | Andrew Kaplowitz | AECOM is a global provider of professional technical and management support services for public and private clients around the world. The company operates through two segments: Americas and International. It offers planning, consulting, architectural and engineering design, and program and construction management services for a range of projects. |
| Arrow Electronics Inc | ARW.N | 7.5% | 2 | 125.58 | 135 | USD | Jim Suva, CPA | Arrow Electronics, Inc (ARW) is a leading global distributor of electronics components and computer products. Arrow serves as a supply channel partner for more than 125,000 original equipment manufacturers, contract manufacturers and commercial customers through a global network of more than 465 locations in over 90 countries. No single customer representing more than 10% of sales. Sales by geography: 50% Americas, 28% Europe/EMEASA, and 22% Asia/Pacific. Arrow has two business segments: Electronics Components (EC) at 72% of sales and Computing Solutions (ECS) at 28% of sales. The Global Components segment distributes electronic components to original equipment manufacturers and contract manufacturers. The Global Enterprise Computing Solutions Business segment distributes enterprise and mid-range computing products, services and solutions to value-added resellers. |
| Ashok Leyland | ASOK.BO | 27.5% | 1 | 125.85 | 160 | INR | Arvind Sharma | ALL is owned by the Hinduja Group (which has an equity stake of 50.4%). ALL is the second-largest CV manufacturer in India, with a strong focus on medium and heavy commercial vehicles (MHCVs). The company's core product portfolio comprises MHCVs (goods vehicles and buses), and it also manufactures a range of vehicles suited for defense and special applications. The company has recently introduced a new range of LCVs. Sales of spares and engines add to revenue and earnings, especially during cyclical downturns. |
| Autostore | AUTO.OL | 22.0% | 2 | 36.075 | 44 | NOK | Martin Wilkie | AutoStore is a pure-play on warehouse automation, with a focus on cubic storage technology in the automated storage and retrieval systems (AS/RS) market, where it is by far the market leader. |
| Avnet Inc | AVT.O | 1.5% | 2 | 39.23 | 39 | USD | Jim Suva, CPA | Avnet Inc (AVT) is a leading global distributor of electronics components. At the end of fiscal 2019, Avnet had two primary operating groups — Electronic Components ("EC") and Premier Farnell ("PF"). EC markets and sells semiconductors and interconnect, passive and electromechanical devices and integrated components to a diverse customer base serving many end-markets. PF distributes electronic components and related products to the electronic system design community utilizing multi-channel sales and marketing resources. Avnet is headquartered in Phoenix, AZ and has ~15,700 employees. Sales by geography: ~30% Americas, 34% EMEA, and 37% Asia/Pacific. EC comprised ~93% of total revenue and PF ~7% in the trailing 12 months. |
| CDW Corp | CDW.O | 10.2% | 1 | 191.99 | 210 | USD | Jim Suva, CPA | Headquartered in Lincolnshire, Illinois, CDW is the largest value-added reseller in North America with ~5% market share. The company provide value-added IT solutions to 250,000 customers in corporate (>250 employees), small businesses (<250 employees) and public sectors (incl. healthcare, education, state and federal government). Originally incorporated in 1984, the company started with selling computers and printers (CDW stands for "Computer Discount Warehouse") and continues to evolve their product offerings which now include hardware, software (incl. cloud applications) and services. The company derives 90% of revenue in the U.S. and 10% of revenue in Canada and UK. CDW purchases products both directly from vendor partners and from wholesale distributors. Key vendors include: Apple, Cisco, Dell EMC, HP Inc, Lenovo, and Microsoft. Key distributors include: Ingram Micro, Tech Data, and Synnex. The company has no customer accounts for over 10% of total sales.<br><br>CDW had its first IPO in 1993 and was acquired by Madison Dearborn Partners in 2007. The company went public again in 2013. |
| COSCO Shipping Holding | 1919.HK | 73.9% | 1 | 14.12 | 23.3 | HKD | Kaseedit Choonnawat | Based in China, COSCO Shipping Holding (CSH) is an international holding company that engages in container shipping, ports and related operations. CSH, which owns major stakes in COSCO Shipping Lines (100%), COSCO Shipping Ports (50.23%), and Orient Overseas Ltd (73.66%), is the largest integrated shipping company in China. COSCO Shipping Lines operates 397 international and domestic routes, with half of capacity dedicated to serving key East-West trade lanes, consisting of 330 ports and 100 countries. COSCO Shipping Ports has more than 357 berths across 36 ports globally. As of 2020, CSH has a 536-strong fleet (164 owned and 372 chartered), tallying to over 3 million TEUs of total |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | capacity - making it the world's 3rd largest by TEU capacity then. COSCO Group is a member of OCEAN Alliance. China COSCO Shipping Corporation Ltd is the major shareholder at 46%. |
| CSX Corp. | CSX.O | 17.6% | 1 | 36.05 | 42 | USD | Christian Wetherbee | CSX Corporation, based in Jacksonville, Florida, is a rail-based transportation company with a rail network of approximately 20,500 route miles located throughout 23 states in the eastern one-third of the United States, connecting the U.S. East Coast, Midwest, and Gulf Coast. |
| Deutsche Post | DPWGn.DE | 41.5% | 1 | 53.24 | 74 | EUR | Sathish B Sivakumar | DPWN AG, branded DP DHL, is headquartered in Bonn and provides businesses and consumers worldwide with time-certain express, freight forwarding, supply chain and mail services. DP DHL collects, transports stores, sorts and distributes all types of freight including letters, printed matter, parcels and freight using owned and third-party assets. DP DHL has grown rapidly since 1998, including as a result of >100 acquisitions, and now employs nearly 450,000 in >220 countries and territories, with core sales of over €66bn in 2020. |
| Duke Realty Corp | DRE.N | 14.8% | 1 | 61.86 | 70 | USD | Michael Bilerman | Duke Realty Corporation is one of the largest publicly traded industrial companies in the U.S. Duke has a major presence in 20 major logistics markets. Duke owns and operates ~160 million square feet of properties and also is a significant developer of industrial properties. |
| Gildan Activewear Inc. | GIL.TO | 23.9% | 1 | 52.3 | 50 | CAD | Paul Lejuez, CFA, CPA | Gildan Activewear (GIL) is a manufacturer and marketer of basic family apparel. The company was incorporated in 1984 and completed an initial public offering in 1998. GIL sells t-shirts, fleece, sport shirts, underwear, socks, hosiery, and shapewear. The company’s brands include Anvil, Gildan, Gold Toe, Secret, Silks, and Therapy Plus (among others). GIL owns and operates vertically-integrated, large-scale manufacturing facilities and sells its products in the US, Canada, Latin America, Asia-Pacific, and Europe. GIL is headquartered in Montréal, Canada. |
| GLP J-REIT | 3281.T | 13.0% | 1 | 191600 | 211000 | JPY | Masashi Miki, CFA | GLP invests mainly in relatively rare cutting-edge logistics facilities, and we forecast that supply/demand for them will remain relatively tight. As average rents on facilities owned by GLP are low, we are upbeat on the prospects for endogenous growth through rent hikes. We are also optimistic about the outlook for exogenous growth, thanks to the extensive pipeline, and overall we are hopeful of stable profit growth even in an environment in which there is a lack of visibility on economic conditions. |
| Goodman Group | GMG.AX | 6.4% | 1 | 26.13 | 27.5 | AUD | Suraj Nebhani, CFA | The Goodman Group (GMG) is a vertically-integrated, internally-managed global property group specialising in industrial property ownership, funds management, property development, project and development management, and property services. It is the largest industrial property group by market cap on the ASX. |
| Hapag Lloyd AG | HLAG.F | 20.6% | 1 | 229.6 | 250 | EUR | Sathish B Sivakumar | The combination of HLAG and the container activities of CSAV on 2 Dec 2014 created the global #4 container shipping line by capacity that operates 121 services with a 241 vessel fleet. In 2020 HLAG generated EBITDA of US$3.1bn on revenue of US$14.6bn. |
| Honeywell International Inc. | HON.O | 26.7% | 1 | 211.54 | 264 | USD | Andrew Kaplowitz | Honeywell International, Inc. is a diversified industrial company, which manufactures aerospace products, control technologies, power generation systems, specialty chemicals, fibers, plastics and electronic materials. Honeywell’s products and services include components for aerospace and defense, sensing and security technologies for buildings and homes, turbochargers, specialty chemicals, electronic and advanced materials, process technology for refining/petchem, and energy efficient products and solutions for homes, business and transportation. Honeywell operates through four business segments: Aerospace, Building Technologies, Performance Materials and Technologies, and Safety and Productivity Solutions. The company is headquartered in Charlotte, NC. |
| International Container Terminal Services | ICT.PS | 5.4% | 1 | 195.5 | 202 | PHP | Kaseedit Choonnawat | Established in 1987, ICT is an international operator of user container terminals that serves the global container shipping industry. Its key business services include the acquisition, development, operation and management of container terminals across the world. It also handles break bulk cargoes (storage, packing, weighing etc.). ICT operates in 19 countries and is involved in 32 terminal concessions with annual throughput capacity ranging from 150k-3,300k TEUs. Asia accounted for 52% of total volumes, America 30% and EMEA 18% as of 2020. ICT focuses more on O&D, which allows it to realize higher yields/TEU than transshipment facilities. Its revenues come primarily from port operations. In May 1988, the Philippine Ports Authority awarded ICT a concession to exclusively operate Manila International Container Terminal (MICT) for 25 years, which was extended by another 25 years to May 18, 2038. |
| J.B. Hunt Transport Services Inc. | JBHT.O | 2.6% | 1 | 200.975 | 205 | USD | Christian Wetherbee | J.B. Hunt is one of the largest surface transportation, delivery, and logistics companies in North America. The company operates in five business segments: J.B. Hunt Intermodal, Dedicated Contract Services, Final Mile Services, Truckload, and Integrated Capacity Solutions. For the calendar year ended December 31, 2020, J.B. Hunt's consolidated revenue totaled $9.6 billion, after the elimination of intersegment business. Of the pre-intersegment total, 48% was generated by the JBI business segment, 23% by Dedicated, 7% by Final Mile, 17% by ICS, and 5% by JBT. |
| Jabil Inc | JBL.N | 40.9% | 1 | 64.1 | 90 | USD | Jim Suva, CPA | Jabil Circuit is a leading global provider of EMS products and services and is the third-largest contract manufacturer in the world. Its offerings include design, engineering, and manufacturing solutions for OEMs, as well as after-market service and repair. Approximately 40% of sales are from Diversified Manufacturing Services, which includes Jabil's Nypro businesses of healthcare & packaging, as well as its Green Point business, including mobility, consumer lifestyles and wearables. 60% of sales are from Electronics Manufacturing which includes businesses formerly reported in High |

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| | | | | | | | | Velocity, Enterprise & Infrastructure and Industrial & Energy. Jabil has one customer with over 10% of revenue (Apple ~28%). Cisco and Hewlett Packard Enterprise are also major customers but below the 10% level and Jabil has moved away from Blackberry. The company has a unique work-cell approach to its customers, under which it assigns a worldwide project manager for each customer, who essentially owns, launches, manages, and assumes the risk and rewards for the customer manufacturing relationship. |
| Jacobs Engineering | J.N | 20.9% | 1 | 141.31 | 170 | USD | Andrew Kaplowitz | Jacobs Engineering Group, Inc. operates as a technical professional services company. It provides a diverse range of technical, professional, and construction services to a large number of industrial, commercial, and governmental clients. It operates through two segments: Critical Mission Solutions and People & Places Solutions. J sold its EC&R segment to WorleyParsons. |
| JD Logistics | 2618.HK | 60.3% | 1 | 27.45 | 44 | HKD | Brian Dapeng Gong | JD Logistics, established in 2007 as the in-house logistics department of JD.com, is China's largest provider of integrated supply chain logistics services, based on 2019 revenue, per CIC. The company has built 1) a nationwide logistics infrastructure and network including warehouses, line-haul transportation, last-mile delivery, bulky items, cold-chain logistics, and cross-border services, 2) a strong technology platform including automation, digitalization and intelligent decision-making. JDL opened up its solutions and services to external customers in 2017. As of 1H21, JDL operated >1,200 warehouses with a GFA of ~23mn sqm and it had 200k delivery personnel. In 1H21, 69% of JDL's total revenue came from integrated supply chain customers (ISC), with other customers accounting for the remaining 31%. |
| KION Group | KGX.DE | 19.7% | 1 | 97.06 | 115 | EUR | Martin Wilkie | KION Group sells forklifts, warehouse technology, and associated services. It is world number two and the European market leader. KION has seven brands in forklifts – Linde, STILL, Baoli, Fenwick, OM STILL and Voltas; while Dematic, Egemin and Retrotech form Supply Chain Solutions within the group. |
| Kornit Digital | KRNT.O | 22.8% | 1 | 138.43 | 170 | USD | Jim Suva, CPA | Founded in 2003, Kornit Digital is a leading manufacturer of commercial direct-to-garment printers, inks and software for the garment, apparel and textile industries. Kornit's end-to-end solution is built on its proprietary NeoPigment ink process with integrated pretreatment; plus industry-leading print-on-polyester solution. Large customers include Amazon (9% in FY20), Fanatics, Adidas, Delta Apparel, Spoonflower and Cimpress. |
| LG Innotek | 011070.KS | 19.2% | 1 | 302500 | 360000 | KRW | Peter Lee | LG Innotek, which was established in 1970, is a global manufacturer of IT components including camera modules and PCBs that are diversely applied in smartphones, autos, LED, displays, semiconductors, and IoT. LG Innotek's four business divisions are Optic Solutions, Substrate & Materials, Automotive Components, and LED. |
| Mahindra & Mahindra | MAHM.BO | 33.7% | 1 | 836.5 | 1110 | INR | Arvind Sharma | Mahindra & Mahindra (M&M) manufactures tractors, utility vehicles, light commercial vehicles, MHCVs and 2/3-wheelers in India. M&M is a leading player in the utility vehicle segment and the market leader in the tractor segment. |
| Markforged Holding Corp | MKFG.N | 46.8% | 2 | 5.45 | 8 | USD | Jim Suva, CPA | Markforged designs, markets and distributes additive cloud-connected metal and composite printing machines with which users can create items for new or replacement products or components commonly known and referred to as 3D printing. Unlike other 3D printers which often are associated with prototyping products, the Markforged products are used in real life for repairs, replacement and full products including robust industrial and automotive uses. Due to the connected-design of Markforged devices, can be remotely printed to anywhere an appropriately-equipped machine is located. In addition to the machines themselves, the company also offers a variety of consumables/materials including multiple metal alloys, as well as a range of composite and nylon formulations. These materials can additionally be reinforced by a range of fiber (both chopped and continuous), including carbon fiber, aramid (Kevlar), and multiple classes of fiberglass – all to serve a broad set of applications, from industrial automation, Aerospace, and Military/Defense, to Space, Health/Medical, and Automotive.<br><br>The company also creates and distributes Software/Services to complement its hardware offering, forming a Markforged ecosystem. The company's cloud-enabled software allows users to create and optimize builds, print and monitor jobs, as well as manage and store engineering projects in a secure part library (including versioning) and allowing users to easily recall projects and send to print anywhere one can access an appropriately configured Markforged printer. Moreover, users can manage one, or a fleet, of printers worldwide, complete with automatic updates, analytics, usage data, and live telemetry via a single dashboard.<br><br>Markforged categorizes its business along similar lines: Hardware (72% of 2020 revenues), Consumables (22% of 2020 revenues, approx 10K installed base), and Services (6% of 2020 revenues).<br><br>Markforged products and services are sold worldwide, with 57% of 2020 revenues was from the Americas, 27% from EMEA, and 16% from APAC. The company sells its product almost entirely through its 100+ channel partners globally, with very little direct sales. Founded in 2013 and headquartered in Watertown, Massachusetts, the company employs approximately 261 individuals (221 locally). |

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| Norfolk Southern Corp. | NSC.N | 10.0% | 1 | 285.9 | 310 | USD | Christian Wetherbee | Norfolk Southern Corporation, based in Norfolk, Virginia, is a rail-based transportation company with a rail network of approximately 19,500 route miles throughout 22 states in the eastern one-third of the United States, connecting the U.S. East Coast, Midwest, and Gulf Coast. |
| Ocado Group PLC | OCDO.L | 69.9% | 1 | 17.07275 | 29 | GBP | Nick Coulter | |
| Oracle Corporation | ORCL.K | -0.1% | 2 | 101.02 | 100 | USD | Tyler Radke | Oracle is the largest enterprise software company in the world and a principal supplier of computer server and storage systems. Founded in 1977, Oracle began as one of the first vendors of relational database software, the original Oracle product that now commands close to 50% market share. In 1987 Oracle began selling application software and after an acquisition spree in 2004-06, Oracle became the second-largest supplier of enterprise application software after SAP. |
| Prologis Inc | PLD.N | 17.7% | 1 | 158.41 | 184 | USD | Michael Bilerman | Prologis, Inc. is the global leader in logistics real estate with a focus on high-barrier, high-growth markets. As of June 30, 2021, the company owned or had investments in, on a wholly owned basis or through co-investment ventures, properties and development projects expected to total approximately 994 million square feet (92 million square meters) in 19 countries. Prologis leases modern logistics facilities to a diverse base of approximately 5,500 customers principally across two major categories: business-to-business and retail/online fulfillment. |
| Rexford Industrial Realty Inc. | REXR.N | 15.7% | 1 | 75.2 | 86 | USD | Michael Bilerman | Rexford Industrial is a real estate investment trust focused on owning and operating industrial properties in Southern California infill markets. The company owns interests in 278 properties with approximately ~35 million rentable square feet with an additional ~1m square feet in its repositioning properties. |
| Rockwell Automation | ROK.N | 15.2% | 1 | 351.02 | 400 | USD | Andrew Kaplowitz | Rockwell Automation, Inc. provides industrial automation power, control, and information solutions to help manufacturing customers achieve competitive advantages for their businesses by reducing total cost of ownership, maximizing asset utilization, improving time to market and reducing enterprise business risk. The company operates its business through the following segments: Architecture and Software, and Control Products and Solutions. Brands include Allen-Bradley, Rockwell Automation, and Rockwell Software. The company is headquartered in Milwaukee, WI. |
| SAP SE | SAPG.DE | 0.3% | 2 | 121.2 | 120 | EUR | Amit B Harchandani | SAP is the world’s largest provider of enterprise application software. Founded in 1972, it is headquartered in Walldorf, Germany. It reported total revenue of ~EUR 27.3bn in 2020. |
| SEGRO | SGRO.L | 15.8% | 1 | 13.86 | 15.79 | GBP | Aaron Guy | SEGRO plc is a property investment and development company. The company provides flexible business space across Europe with offices, light industrial, logistics, warehouses and data centre properties. |
| Shenzhou Int'l | 2313.HK | 20.2% | 1 | 158.4 | 188 | HKD | Eric Lau | Established in 1990, Shenzhou (SZ) is now the largest vertically-integrated knitwear manufacturer globally. SZ’s manufacturing facilities are located in China (Ningbo and Anhui), Vietnam and Cambodia with output breakdown at 75% China and 25% in Vietnam and Cambodia combined. Currently sportswear remains the largest contributor to group revenues (73.4% of total revs in 1H20) followed by casual wear (18.7%) and lingerie (6.1%).<br><br>By region, SZ has a well-diversified split with China 28%, the EU 19%, JP 19%, the US 14% and other countries 20% as of 1H20. |
| SMC | 6273.T | 11.1% | 1 | 76210 | 84000 | JPY | Graeme McDonald | SMC is one of a handful of world-class blue-chip Japanese machinery companies, with the top global share in pneumatics (37%), high operating margins, and a rock-solid balance sheet. In addition, the company generates c30% of sales from Asia, with the largest markets being China, South Korea, and Taiwan. SMC continues to generate margins well above the average for global industrials. According to SMC, in FY3/21 H1 tech-related customers made up more than 30% of parent domestic sales, with 21% from the auto industry, 9% from machine tool makers, and 4%-5% each from food and medical equipment suppliers. Over the past seven years, SMC has seen a sales CAGR of around 7%. |
| Synnex Corp | SNX.N | 45.0% | 1 | 107.46 | 155 | USD | Jim Suva, CPA | Synnex Corp distributes peripherals and IT as well as systems design and integration solutions. The company distributes more than 30,000 technology products (as measured by active SKUs) from more than 300 IT, CE and original equipment manufacturers or OEM suppliers to more than 20,000 resellers, system integrators, and retailers throughout the United States, Canada, and Japan. The company completed Concentrix (call center business) spinout in December 2020. |
| Techtronic | 0669.HK | 12.1% | 1 | 163.5 | 183 | HKD | Eric Lau | Founded in 1985 as an OEM, Techtronic has become a global leader in the design, manufacture and sale of home-improvement products. Its main businesses are power tools, outdoor power equipment, and floor-care appliances. It has well-established and fast-growing brands, including “Ryobi”, “AEG” and “Milwaukee” in power tools; “Ryobi” and “Homelite” in outdoor power equipment; and “Regina”, “Royal”, “Dirt Devil”, “Vax” and “Hoover” in floor-care appliances. The group has also licensed the “Ridgid” brand from Emerson. Techtronic produces on an OEM basis and for private labels. It is headquartered in Hong Kong and maintains manufacturing and research facilities in Asia, Europe and N. America, as well as customer service networks in N. America, Europe and Australasia. It employs more than 21,600 people. Techtronic derives a large portion of its revenue from N. America. Home Depot is the group's largest customer, and accounted for 45% of group sales in 2018. |

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| Traxion | TRAXIONA.MX | 41.8% | 1 | 31.74 | 45 | MXN | Stephen Trent | Traxion is a leading Mexican ground transportation company that services the trucking, e-commerce and personnel transportation segments. The company has a long track record of growing both organically and through acquisitions. |
| TSMC | 2330.TW | 57.1% | 1 | 599 | 930 | TWD | Roland Shu | Established in 1987, TSMC is the world's first dedicated semiconductor foundry. As the founder and a leader of the dedicated IC foundry segment, TSMC has built its reputation by offering advanced and "More-than-Moore" wafer production processes and unparalleled manufacturing efficiency. From its inception, TSMC has consistently offered the foundry segment's leading technologies and TSMC COMPATIBLE design services. TSMC is listed on the Taiwan Stock Exchange (TWSE) under ticker number 2330, and its American Depositary Shares trade on the New York Stock Exchange (NYSE) under the symbol "TSM". |
| Union Pacific Corp. | UNP.N | 1.5% | 1 | 245.94 | 245 | USD | Christian Wetherbee | Union Pacific Corporation is a diversified transport company that provides rail freight transportation over a network of approximately 32,200 route miles located in 23 states in the western two-thirds of the United States. |
| WiseTech Global | WTC.AX | -16.7% | 2 | 55.95 | 46.5 | AUD | Siraj Ahmed | Founded in 1994, WiseTech is a leading software provider to the logistics execution industry, with more than 15,000 customers in more than 150 countries. Cargowise One, WiseTech's core product, is a market leading SaaS solution that is used by many of the largest logistics providers in the world. In recent years, WiseTech has made numerous acquisitions in order to expand its geographical reach and expand into adjacencies, with a vision to be the operating system for its customers and broader ecosystem. |
| Yang Ming Marine | 2609.TW | 53.8% | 1 | 120 | 172 | TWD | Kaseedit Choonnawat | Yang Ming Marine Transport Corporation (YM) was established in 1972, and is now c48% owned by the Taiwan government and related agencies. It owns and operates a container shipping service (c86% of revenue) with the world's ninth-largest fleet by TEU where TransPacific and Asia-Europe together account for 68% of TEU capacity exposures. YM is a member of THE Alliance. As of December 2020, YM had a fleet of 89 vessels tallying to 615K TEUs of total capacity. Over half of its fleet are larger than 10,000 TEU, coinciding with its long-haul centric routes exposures. |
| ZIM Integrated Shipping | ZIM.N | 113.8% | 1 | 49.12 | 90 | USD | Sathish B Sivakumar | ZIM, headquartered in Israel, is one of the ten largest containers shipping company by capacity. As of July 2021, ZIM operated c.113 vessels and c.30 vessels charter will expire in the next 12months. ZIM operates across five trade zones – Transpacific, Atlantic, Cross Suez, Intra-Asia and Latin America. |

Pricing correct as of markets close, 13 December 2021

Source: Citi Research

**Figure 10. Potential Beneficiaries of Supply Chain Disruption per Super Sector**

| Company Name | RIC | Super Sector | Analyst | Analyst Comments |
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| A.P. Møller - Mærsk A/S | MAERSKb.CO | Industrial Tech & Mobility | **Sathish B Sivakumar** | In Sea freight, we see the port congestion is driven by bottlenecks in sea and land-side. Specifically, the land side bottleneck is spread across Europe and North America and it is mainly driven by labor shortages in the inter-modal operations. The container turn around on land side is up 3X in US and 2X in Europe versus 2019. Hence, we see any normalisation in congestion will be between three to six months. Thus the rates will remain at elevated levels. We see Hapag Lloyd, Maersk and ZIM as beneficiary of rates remaining at elevated levels for longer. |
| Aecom | ACM.N | Industrial Tech & Mobility | **Andrew Kaplowitz** | ACM.N - Aecom (ACM) as a global infrastructure design and consulting firm can offer solutions to customers to improve the efficiency/footprint of their supply chains. ACM through its Buildings + Places practice supports all stages of asset management for its customers, ensuring optimal asset efficiency. Given global supply chain pressure is leading customers to question their own supply chain footprint, we think they will increasingly turn to ACM to understand the efficiency, resiliency, and sustainability of their footprint. Furthermore, as customers reassess whether they need more "local-for-local" manufacturing/supply chain footprint, we think they will increasingly turn to ACM to help design new facilities. |
| Ashok Leyland | ASOK.BO | Industrial Tech & Mobility | **Arvind Sharma** | Ashok Leyland (ASOK.BO) - A pure play on the Indian commercial vehicle space. In India, road transportation is one of the most important in land logistics medium. Inland waterways are underdeveloped, air cargo is expensive and trains are not time-efficient (though indispensable for bulk cargo). As inter-state road transport revives from a sharp downtick due to Covid and we see the cycle reversing, Ashok Leyland stands to benefit. Additionally, the company is making a big foray into the light commercial vehicles (LCV) segment, where proliferation of e-commerce, rural income growth and last mile connectivity are likely to be key drivers. Ashok Leyland is our #2 Buy in the Indian auto space (after Maruti Suzuki). |
| Autostore | AUTO.OL | Industrial Tech & Mobility | | Autostore (neutral) - AutoStore is a pure-play on warehouse automation, with a focus on cubic storage technology in the automated storage and retrieval systems (AS/RS) market, where it is by far the market leader in this small but fast-growing niche. Cubic storage is used in high density warehouses for goods that are physically smaller (in retail or smaller industrial products). While eCommerce fulfilment in apparel & sports has historically been the largest market, and micro fulfilment for grocery has the potential to be the fastest growing, third party logistics and industrial supply chain automation are increasingly important where Autostore's technology can be used to increase supply chain efficiency |
| COSCO Shipping Holding | 1919.HK | Industrial Tech & Mobility | **Kaseedit Choonnawat** | COSCO Shipping Holding (1919 HK, Buy, HK$ 23.3 TP) and Yang Ming Marine (2609 TT, Buy, NT$172) are our APAC container picks given the two are key beneficiaries of elevated freight rates, valuations look undemanding relative to prospective returns and they have swiftly growing net cash position against conservative capex commitments. |
| CSX Corp. | CSX.O | Industrial Tech & Mobility | **Christian Wetherbee** | As we noted, within our Transport coverage we think better fluidity would be positive for the rails, as it could unlock volume which would be moving at higher prices, and reduce congestion related costs. We continue to prefer the eastern rails, CSX and Norfolk Southern due to export coal exposure (in addition to this dynamic) but believe Union Pacific would also benefit, particularly given its exposure to WC ports. |
| Deutsche Post | DPWGn.DE | Industrial Tech & Mobility | **Sathish B Sivakumar** | In the air freight segment, we expect the slow recovery in the long haul air travel over the winter will result in a tight supply dynamics ahead of the Q4 peak season. We believe the air freight market will continue to benefit from the bottleneck in sea freight. Hence, we believe the dedicated air freight carriers will benefit from these favorable supply dynamics. Hence our top pick for the tight air freight market is DP DHL given it's exposure to freight forwarding and express segments. |
| Hapag Lloyd AG | HLAG.F | Industrial Tech & Mobility | **Sathish B Sivakumar** | In Sea freight, we see the port congestion is driven by bottlenecks in sea and land-side. Specifically, the land side bottleneck is spread across Europe and North America and it is mainly driven by labor shortages in the inter-modal operations. The container turn around on land side is up 3X in US and 2X in Europe versus 2019. Hence, we see any normalisation in congestion will be between three to six months. Thus the rates will remain at elevated levels. We see Hapag Lloyd, Maersk and ZIM are beneficiary of rates remaining at elevated levels for longer. |
| Honeywell International Inc. | HON.O | Industrial Tech & Mobility | **Andrew Kaplowitz** | HON.O - Honeywell (HON) through its Intelligrated warehouse automation solutions platform can help ameliorate supply chain/labor challenges created by significant SKU growth and strong global package-related demand. While HON is a diversified global leader in the manufacturing of aircraft components and technology as well as offering building solutions, automation control, and safety and productivity solutions, with respect to supply chain management, we think HON's Intelligrated warehouse automation products and solutions in particular seem well positioned to continue to benefit from a significant build-out in automation within warehouses/distribution centers that expedites the throughput of products through global supply chains. HON offers advanced material handling systems to reduce the time and labor costs associated with inbound processing, sortation systems to support shipping activities, as well as smart, flexible palletizing solutions, and we think given continued high rates of warehousing/distribution center growth as well as customers' increasing preference for higher levels of automation within their warehouses/DCs that HON will stand to benefit. |

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| International Container Terminal Services | ICT.PS | Industrial Tech & Mobility | **Kaseedit Choonnawat** | We see Intl Container Services Terminal (ICT PM, Buy, PHP202 TP) as a key beneficiary of strong container freight rates translating to ports' pricing power and throughput growth that's barely affected by congestions given gateway-centric mix. Its relatively low utilization base provides operating leverage slingshot into industry's up-cycle. |
| J.B. Hunt Transport Services Inc. | JBHT.O | Industrial Tech & Mobility | **Christian Wetherbee** | We also think intermodal player JB Hunt would be a key beneficiary, as better rail service and a large container fleet could drive strong volume gains in 2022. Finally, an improving supply chain and particularly any regulatory moves that could result in incremental capacity would be negative for truckload carriers. |
| Jacobs Engineering | J.N | Industrial Tech & Mobility | **Andrew Kaplowitz** | J.N - Jacobs (J) provides a full spectrum of professional services including consulting, technical, scientific and project delivery for the government and private sector. J's Advanced Facilities business in particular is helping customers in end markets such as Life Sciences and Semiconductors (as well as others) navigate through historically high demand for their products by helping them design new state-of-the art local-for-local manufacturing footprint. J offers sophisticated digital tools to help maximize facility investment and improve supply-chain efficiency for these customers who are faced with increasingly complex decisions regarding where and how to set up incremental capacity. Given we see particular growth in "reshoring" in Life Sciences and Semiconductors/Electronics, where we think J has leading consulting market share, we expect J's sales/earnings to continue to accelerate in this area. |
| KION Group | KGX.DE | Industrial Tech & Mobility | **Martin Wilkie** | KION (KGX.DE, Buy) - Supply disruptions have led to full warehouses and a surge in warehouse construction, adding to an investment cycle already being driven by the long term eCommerce theme. KION is the #1 supplier globally for warehouse automation system systems and #2 for material handling trucks. KION's Supply Chain Solutions business supplies robotic palletizing/de-palletizing systems, storage systems, and sortation systems for warehouses, and has already seen its order backlog hit a record high in 2021. Penetration of automation in warehouses is less than 10%, leaving significant penetration upside. We expect the combined drivers of ongoing eCommerce penetration and higher investment in supply chain resiliency as potential key drivers for KION. |
| Mahindra & Mahindra | MAHM.BO | Industrial Tech & Mobility | **Arvind Sharma** | Mahindra & Mahindra (MAHM.BO) - One of the top two players in the LCV (Light Commercial Vehicles) segment. Mahindra stands to gain from e-commerce, last mile connectivity and rural demand. Specifically for rural demand, given M&M has a very strong presence in rural India (due to its dominant position in the agricultural tractor segment). |
| Norfolk Southern Corp. | NSC.N | Industrial Tech & Mobility | **Christian Wetherbee** | As we noted, within our Transports coverage we think better fluidity would be positive for the rails, as it could unlock volume which would be moving at higher prices, and reduce congestion related costs. We continue to prefer the eastern rails, CSX and Norfolk Southern due to export coal exposure (in addition to this dynamic) but believe Union Pacific would also benefit, particularly given its exposure to WC ports. |
| Rockwell Automation | ROK.N | Industrial Tech & Mobility | **Andrew Kaplowitz** | ROK.N - We think Rockwell Automation (ROK) is ideally situated to provide automation/digital solutions that could improve efficiency/productivity to its customers faced with a myriad of supply chain inefficiencies. ROK is the largest U.S. pure-play automation-focused company with significant expertise in automation-focused supply chain management. ROK's software and cloud-native solutions can improve agility, resiliency, and sustainability within manufacturing supply chains. Moreover, as potential manufacturing customers seek to improve their supply chain resiliency by establishing more "local-for-local" operations, we think these customers will increasingly turn to ROK's automation, especially given ROK's integrated information technology/operational technology offerings offer a quick payback/return in a higher logistics/labor cost environment |
| Shenzhou Int'l | 2313.HK | Industrial Tech & Mobility | **Eric Lau** | Shenzhou (2313.HK, Buy) – Shenzhou is the global largest sportswear mfg for Nike, Adidas, Uniqlo and Puma. Nike and Adidas mostly source of sportswear and footwear from Vietnam. The suspension of most factories in Ho Chi Minh, Vietnam has even caused Nike to cut FY22 guidance. Shenzhou factories in VN also suspended for a short while in Aug but resumed in Sep. At present, the utilization rate in VN factories has risen to 90-95% in Nov and the company targets to further raise to full productivity by end-Nov. Many of the rivals were suspended for a longer while and would take a longer time for resumption. As such, Shenzhou has been gaining more share in view of the recent supply chain shortage. We work out the estimated rev in 2021 would grow 19% against 2019 which has significantly outperformed most comps (like Crystal 2232.HK, Makalot 1477 TT ) with the ratio of flat to single-digit growth, and also outperformed its major customers Nike at ~14% and Adidas down 9% over the same horizon, according to Citi revenue forecasts for 2021. |
| SMC | 6273.T | Industrial Tech & Mobility | **Graeme McDonald** | SMC (6273, Japan) – One of the impacts of the supply chain bottlenecks will be a reassessment of how companies think about what is an appropriate level of inventory. The previous mantra of 'Just In Time' could be replaced by 'Just In Case' with some near-term pressure on FCF. As the top global supplier of pneumatic components SMC has long been seen as a beneficiary of the secular shift towards automation but many investors have pushed back on the name arguing that the company always held too much inventory (equivalent to >300 days sales as of the end of Mar-21). The company has long argued a high level of inventory allows them to deliver 70% of all orders within three days and it seems to us that over the past twelve months or so this high level of inventory has also enabled them to win market share from some of their 'leaner' competitors. The small size / light weight of its components also mean that if there are issues shipping from its main plants in Japan and China then air freight is a quick alternative. On top of this, when we consider that growing demand for semiconductors will also boost orders for SPE (semiconductor production equipment) which is the largest end market for SMC's products the company would seem to be well positioned to profit over the next couple of years. |
| Techtronic | 0669.HK | Industrial Tech & Mobility | **Eric Lau** | Techtronic (0669.HK, Buy) – Techtronic is the global second largest power tools mfg with ~15% share. Most of the peers faced challenges of supply chain disruption from the perspective of semiconductor (for Li-ion battery management system), insufficient |

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| | | | | material supply such as Li-ion battery cell, suspension of production in Cambodia during 2Q and Vietnam during 3Q along with shortage of containers for shipment from Asia into US/EU. Techtronic benefits from this supply chain shortage so that the company has inflated the ASP easily thru product mix upgrade during 3Q21 in order to fully offset the rising material cost. Additionally, the company has been gaining share more rapidly either such that the estimated 2021 rev over 2019 would be 71.3% against other direct comps of Stanley Black & Decker at 18.8%, Makita at 24.0% and Greatstar at 43.4% on 2-yr stack basis. Techtronic can get rid of most macro challenges due to earlier preparation of the supply chain constraints such as 1) extension into Chinese battery cell suppliers from mostly Korean before, 2) outsourcing business model in certain low-end products with greater flexibility for stable supply and 3) enhancement of internal control. |
| Traxion | TRAXIONA.MX | Industrial Tech & Mobility | **Stephen Trent** | In the wake of global supply chain challenges, Mexican trucking, e-commerce and personnel transport operator Traxion (TRAXIONA.MX, Buy, target price of P$45/share) looks well positioned to see some increased flow, as some cargo potentially gets diverted. Although it is unclear how quickly the port of Los Angeles can de-bottleneck, it is conceivable that some of this flow gets diverted to Mexican ports. Traxion could see upside from its solid domestic volumes and its cross-border cargo capabilities.<br>In addition to having a good anchor in general cargo, Traxion also operates a refrigerated cargo division – a potentially vital service offering products with potentially short shelf life. The company has an average fleet of 8,500 power units with an average age of four years. |
| Union Pacific Corp. | UNP.N | Industrial Tech & Mobility | **Christian Wetherbee** | As we noted, within our Transports coverage we think better fluidity would be positive for the rails, as it could unlock volume which would be moving at higher prices, and reduce congestion related costs. We continue to prefer the eastern rails, CSX and Norfolk Southern due to export coal exposure (in addition to this dynamic) but believe Union Pacific would also benefit, particularly given its exposure to WC ports. |
| Yang Ming Marine | 2609.TW | Industrial Tech & Mobility | **Kaseedit Choonnawat** | COSCO Shipping Holding (1919 HK, Buy, HK$ 23.3 TP) and Yang Ming Marine (2609 TT, Buy, NT$172) are our APAC container picks given the two are key beneficiaries of elevated freight rates, valuations look undemanding relative to prospective returns and they have swiftly growing net cash position against conservative capex commitments. |
| ZIM Integrated Shipping | ZIM.N | Industrial Tech & Mobility | **Sathish B Sivakumar** | In Sea freight, we see the port congestion is driven by bottlenecks in sea and land-side. Specifically, the land side bottleneck is spread across Europe and North America and it is mainly driven by labor shortages in the inter-modal operations. The container turn around on land side is up 3X in US and 2X in Europe versus 2019. Hence, we see any normalisation in congestion will be between three to six months. Thus the rates will remain at elevated levels. We see Hapag Lloyd, Maersk and ZIM as beneficiaries of rates remaining at elevated levels for longer. |
| Duke Realty Corp | DRE.N | Real Estate | **Michael Bilerman** | Duke Realty (DRE) – Duke Realty is an owner, manager, and developer of logistics real estate across the US totaling 160 million square feet. The company is focused on larger average asset sizes which cater to e-commerce and other distribution customers across the US. Customer demand for logistics real estate space remains high driven by supply chain transformation, continued growth in e-commerce (which needs ~3x more warehouse space than traditional retail), and moves for more onshoring and higher inventory levels partially driven by recent supply chain disruptions. Rental rate growth in the space should continue to be high as customers fight for limited space. |
| GLP J-REIT | 3281.T | Real Estate | **Masashi Miki, CFA** | GLP J-REIT specializes in logistics facilities and has one of the largest asset portfolios in the country. With demand for logistics facilities continuing to rise in Japan, GLP-REIT invests in and manages unique and cutting-edge properties. GLP Group, the REIT's sponsor, develops and manages logistics facilities in Japan and around the world, and it was one of the early players in Japan's logistics property market. The sponsor pipeline is about ¥1trn, and in Japan its pace of development is more than ¥200bn, giving GLP J-REIT a pipeline advantage relative to peers.<br>We think GLP J-REIT is able to skillfully meet needs for diversified logistics facilities in terms of both 'hardware' and 'software'. The REIT's ALFALINK series of properties (a bigger project than previous facilities) provide not only storage and distribution services, but also boast upstream logistics functions like product planning, production, and processing, giving the REIT an edge over peers amidst moves toward supply chain integration. We think GLP J-REIT can leverage its 'software' advantages via GLP group companies like Monoful, which provides logistics solutions, and we look for its asset value to increase. |
| Goodman Group | GMG.AX | Real Estate | **Suraj Nebhani, CFA** | Goodman is among the world's largest owners, operators and developers of logistics real estate, and manages a >$60bn portfolio of logistics assets spread all across the world (Aus/NZ, Europe, China/HK, Japan, and parts of the US). These logistics assets primarily include warehouses which are leased to a range of corporates. GMG earns income from the rent generated from its assets, as well as from day-to-day management of these assets on behalf of their investor clients (management income) with management fees linked to asset values (which are rising given the favourable investment demand thematic for logistics assets). GMG earns development income as well by developing these assets for its investor clients, and the development margins for are currently at record highs, and likely to stay there in the near term. |
| Prologis Inc | PLD.N | Real Estate | **Michael Bilerman** | Prologis (PLD) – Prologis owns and develops logistics real estate totaling 994 million square feet across 19 countries. The company leases to approximately 5,500 customers principally in the business-to-business and retail/online fulfillment categories and approximately 2.5% of the world's GDP flows through the company's buildings annually. Customer demand for logistics real estate space remains high driven by supply chain transformation, continued growth in e-commerce (which needs ~3x more warehouse space |

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| | | | | than traditional retail), and moves for more onshoring and higher inventory levels partially driven by recent supply chain disruptions. Rental rate growth in the space should continue to be high as customers fight for limited space. Additionally, PLD's Essentials business provides turnkey warehouse solutions as well as cost savings for tenants |
| Rexford Industrial Realty Inc. | REXR.N | Real Estate | **Michael Bilerman** | Rexford Industrial Realty (REXR) – Rexford is the owner of logistics real estate in Southern California totaling 32 million square feet with ~1,400 customers. The company is uniquely focused solely on the Southern California industrial market which is the largest in the US and 4th largest globally. Exposure to this large, diversified, and supply constrained market has allowed REXR to capture rental rate growth above peers and should continue. The company is seeing many of the same drivers of demand as peers (supply chain transformation, continued growth in e-commerce, and higher inventory levels) but also benefits from increased parking demand from port congestion as well as continued focus on last-mile distribution. The company has grown through acquisitions from private owners and redevelopment and this should continue |
| SEGRO | SGRO.L | Real Estate | **Aaron Guy** | SEGRO (SGRO) – SEGRO's assets and customers are a meaningful part of the European supply chain. SEGRO own, manage and develop warehousing and light industrial properties with 8.8m square metres of built space and a development pipeline of a further 4.8m square metres. The portfolio is 37% Greater London, 16% Thames Valley, 10% UK National Logistics, 11% France, 10% Germany, 4% Poland and 12% across the rest of Europe including for example Italy, Netherlands, Spain and Czech Republic. Their portfolio serves 22% transport & logistics, 18% retail, 10% post and parcel delivery, 17% food and general manufacturing, 10% wholesale distribution, 9% technology, media and telecoms, 7% services and utilities and 7% other including data centres. While there are many drivers of space in SEGRO's portfolio ecommerce is the largest marginal demand driver and we estimate this is set to continue for many years. This is currently driving accelerated build out of new space driving, a driver that could see SEGRO's EPS double with like for like growth in the existing portfolio an additional driver, also currently experienced record levels of growth. |
| Arrow Electronics Inc | ARW.N | Technology & Communications | **Jim Suva, CPA** | ARW: Arrow serves as a supply channel partner for more than 125,000 original equipment manufacturers, contract manufacturers and commercial customers through a global network of more than 465 locations in over 90 countries. No single customer representing more than 10% of sales. We expect inventors to consider potentially giving Arrow a higher valuation multiple should the company be able to continue this high profitability. |
| Avnet Inc | AVT.O | Technology & Communications | **Jim Suva, CPA** | AVT: Avnet is a leading global distributor of electronics components. Avnet has two primary operating groups — Electronic Components ("EC") and Premier Farnell ("PF"). Avnet is headquartered in Phoenix, AZ and has ~15,700 employees. |
| CDW Corp | CDW.O | Technology & Communications | **Jim Suva, CPA** | CDW: Headquartered in Lincolnshire, Illinois, CDW is the largest value-added reseller in North America with ~5% market share. The company provide value-added IT solutions to 250,000 customers in corporate (>250 employees), small businesses (<250 employees) and public sectors (incl. healthcare, education, state and federal government). We see additional government stimulus for education and local government as additional upside. |
| Jabil Inc | JBL.N | Technology & Communications | **Jim Suva, CPA** | Jabil (JBL: Buy; TP $90): Company description – Jabil is the 3rd largest EMS company and has a very global and diversified end product footprint. Benefitting from Supply Chain Challenges – Factories in higher cost locations will see higher utilization rates as companies move production more locally to mitigate supply chain challenges. This will result in higher operating margins for Jabil. |
| JD Logistics | 2618.HK | Technology & Communications | **Brian Dapeng Gong** | JD Logistics: Established in 2007 as the in-house logistics department of the JD Group, JDL is China's largest provider of integrated supply chain (ISC) logistics services, based on 2019 revenue, per CIC. The company has solid infrastructure, especially in warehouse and last-mile delivery, and technologies including automation, digitalization and intelligent decision making capabilities. JDL has strong industry knowhow in FMCG, large appliance and electronics, which can better help its customers to solve industry pinpoints and integrate their services into customers' operation. JDL is enjoying steady growth of JD Retail, who is the largest customer, but also expanding into external customers via 1) serving more top customers, 2) penetrating deeper into their pocket, and 3) penetrating into SMEs across different verticals with standardization and modularization of its services offerings. With strong technologies, JDL should benefit from China govt's favorable policies to encourage modernization and digitalization of logistics industry. |
| Kornit Digital | KRNT.O | Technology & Communications | **Jim Suva, CPA** | KRNT (Buy; TP $170): Company description - Kornit Digital is a leading manufacturer of commercial direct-to-garment printers, inks and software for the garment, apparel and textile industries. Kornit's end-to-end solution is built on its proprietary NeoPigment ink process with integrated pretreatment; plus industry-leading print-on-polyester solution. Benefitted from Supply Chain Challenges - Kornit brings on-demand apparel, sportswear, and home goods solutions. It is well positioned to take advantage of the increasing demand for more unique custom printing and selection coupled with localized printing to reduce inventory, shipping costs and ship time. |
| LG Innotek | 011070.KS | Technology & Communications | **Peter Lee** | We expect LG Innotek to positively benefit from continued Supply Chain disruption and challenges, given LG Innotek's strong position in Camera module business for Smartphone and Automotive. We believe LG Innotek possesses superior Sensor-shift technology vs. its peers, and expect its advanced technology to provide a substantial tailwind going forward, along with company's world-class supply chain management. We also believe smartphone makers' launch of XR features to support metaverse-related applications in 2022E could provide demand upside for the company's TOF (Time of Flight). |
| Markforged Holding Corp | MKFG.N | Technology & Communications | **Jim Suva, CPA** | MKFG (Neutral/High Risk; TP $8): Company description - Markforged designs, markets, and distributes additive cloud-connected metal and composite 3D printing machines. Markforged products are used in real life for repairs, replacement and full products. Benefitting from Supply Chain Challenges - Due to the connected-design of Markforged devices, they can be remotely printed to anywhere an appropriately-equipped machine is located. The 3D parts do not need to be built in low cost countries and shipped around the world. |

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| | | | | Markforged's value proposition resonates in an economy where businesses strive to save costs, minimize supply chain disruptions and the need to react to unforeseen events. |
| Oracle Corporation | ORCL.K | Technology & Communications | **Tyler Radke** | Oracle has a line of back-office/supply chain applications called Fusion Cloud Supply Chain Management and Manufacturing management. This product suite helps companies engage in supply chain planning, inventory management, logistics, product lifecycle management and newer offerings in Blockchain/Iot. The ongoing supply chain challenges have provided an opportunity for software companies to help organizations gain better visibility and identify chokepoints. While Oracle does not break out their supply chain revenue explicitly (as it is a very small % of overall), we would highlight that their broader "ERP cloud" offering has been strong with growth above 30% y/y. We do note the software SCM space is very competitive given the significant specialization required, and many of the perceived leaders in the market (Gartner Magic Quadrant) are relatively smaller scale. |
| SAP SE | SAPG.DE | Technology & Communications | **Amit B Harchandani** | SAP: Enterprise software vendor SAP is the global market leader in Supply Chain Management (SCM) software. According to data from industry research firm Gartner, SAP's market share stood at 27.8% in 2020, almost 2.5x that of the #2 player in this space. In our view, the broader SCM software space (and SAP) should benefit from investments post pandemic in modernizing legacy supply chain processes that in turn should enable the adopters to improve agility and overcome unanticipated economic disruptions. Gartner forecasts that spending on SCM Software will double by 2025, compared to 2020, representing a CAGR of ~14%. Our Neutral rating on SAP is predicated upon a balanced risk-reward profile with elevated near-term uncertainty offsetting the long-term potential. |
| Synnex Corp | SNX.N | Technology & Communications | **Jim Suva, CPA** | SNX: Synnex Corp distributes peripherals and IT as well as systems design and integration solutions. The company distributes more than 30,000 technology products (as measured by active SKUs) from more than 300 IT, CE and original equipment manufacturers or OEM suppliers to more than 20,000 resellers, system integrators, and retailers throughout the United States, Canada, and Japan. We are incrementally more positive on SNX given the company's increasing exposure in value add services |
| TSMC | 2330.TW | Technology & Communications | **Roland Shu** | TSMC is worldwide foundry market share leader (~55%) with a giant technology leadership over the peers. It develops most leading edge technologies and builds capacities according to customers' demands. Most of the time, TSMC fully loads all of the most leading edge capacities it built for customers. The fast asset turns with a price premium helps to justify the rapidly increase capital intensity to build the most leading edge technologies. Besides most leading edge nodes, mainstream and legacy nodes foundry capacities are extremely full due to industry-wide under investment and a buoyant demand from megatrend from AI, 5G, EV, HPC and IoT. The chip shortage from the semiconductor manufacturing capacity tightness not only impact the end demands such as auto, PC/NB, Apple's smartphone…etc. but also prolonged the lead-time of semiconductor precision equipment ( SPE). The prolonged SPE lead-time makes it difficult for semiconductor manufacturers to further expand capacity to ease the tightness in the near term. Most of the semiconductor companies who have reported 3Q21 results indicated the supply chain tightness would continue throughout 2022. TSMC will be able to load its capacities at very high utilization. The pricing environment will be also favorable to TSMC because of tight supply. TSMC will keep advancing revenue and earnings amidst the tight foundry capacity supply in 2022. |
| WiseTech Global | WTC.AX | Technology & Communications | **Siraj Ahmed** | WiseTech is a leading software provider to the logistics execution industry, especially 3PLs, with more than 15,000 customers in more than 150 countries. Cargowise One, WiseTech's core product, is a market leading freight forwarding software solution that is used by many of the largest logistics providers in the world. The recent supply chain disruptions has increased demand for end to end software solutions, especially in terms of visibility and reducing manual-based tasks, and has increased demand for WiseTech's software stack. Further, given many of the largest 3PLs have seen strong profitability in the past 12 – 18 months has also increased the propensity to spend on technology. |
| Gildan Activewear Inc. | GIL.TO | Wellness - Consumer | **Paul Lejuez, CFA, CPA** | GIL is uniquely positioned with its owned manufacturing capacity located in Central America, which gives it a cost/proximity advantage vs those with Asia-based operations. While some retailers/brands that outsource their manufacturing have struggled to secure the capacity needed from many of their Asian counterparties, GIL owns the manufacturing. They are first in line, and more in control than those that don't own their factories and/or are located in Asia.<br>While GIL is typically known as the low cost provider of their products (blank T-shirts, sweatshirts, polos), their Honduras-based manufacturing operations give them an even greater advantage given current market dynamics. GIL has not seen the same cost pressures, which gives them a further cost advantage versus those using Asia manufacturing that might look to increase prices to make up for inflationary cost pressures. In other words, if those using Asia based sourcing look to pass through higher prices (to offset higher costs), price gaps between GIL and competitors will widen (because GIL doesn't face the same magnitude of cost pressures). This will put GIL in an even more favorable competitive position to help capture market share. |
| Ocado Group PLC | OCDO.L | Wellness - Consumer | **Nick Coulter** | OCDO.L – Ocado Group is an online grocery retailer and end-to-end online grocery solution provider for a growing number of food retailers around the world, including Kroger in the US. The cornerstone of the solution is the Hive or automated cube storage and retrieval system which we expect to be increasingly augmented by robotic arm picking in the coming years, as the warehouses as they move towards 'lights out' automation with little human intervention. We also expect the solution to increasingly cater for same day delivery and ultrafast immediacy – and potentially additional retail categories – as Ocado's partners build out 'ecosystems' of linked warehouses in their markets. |

Source: Citi Research

# Industrial Tech & Mobility

# Global Industrials

## The current state of supply chain disruptions

**Martin Wilkie**
Global Head of Industrials Research
martin.wilkie@citi.com

The global industrials sector is diverse in its end markets and business models, but there are some common threads that have impacted the sector over the last ~12 months.

- **Supply chains have been impacted by both component and material shortages**: Post COVID supply chain disruptions first became evident in semiconductors. Semiconductors are everywhere but in industrial markets the key semiconductor component groups are power semiconductors, microcontrollers, connectivity chips, and sensors; these often contribute a very small percentage of the bill of material for most industrial products, but production cannot be completed without them. We have seen some outright temporary production stoppages in markets like heavy duty trucks, and longer lead times in many other markets. Beyond semiconductors, shortages in certain materials like resins (used in composites) have been exacerbated by weather effects and unexpected plant closures, highlighting that tight supply markets are at risk of exogenous events that could normally be absorbed. More recently, the energy crisis in China has led to a shortage of magnesium, often used in aluminum alloys.

- **Logistics, market access and congestion have exacerbated the issues:** Port congestion in China and the shortage of containers has led to supply issues at the point of origin, further exacerbated by market access in countries that are still in high states of lockdown (e.g. Vietnam), or where port access at the point of destination (e.g. the Port of LA in the US) is constrained. Many companies have commented that these port congestion issues have been amplified by a lack of warehouse space and lack of truck drivers to enable onward moving of goods.

- **Labour is a concern, but has caused fewer issues in 2021 as compared to components or logistics:** The most recent ISM survey in the US highlights that manufacturing labour shortages remain an issue, although labour issues have arguably been more impactful in the supply chain (truck driver shortages) than in factories themselves.

## Underlying drivers – the return of the "bullwhip" effect

In the 1990s, a supply chain phenomenon known as the "bullwhip" effect was identified - volatility in demand increased the further up the chain you went, meaning producers saw more volatility than distributors, component suppliers saw more volatility than producers and so forth. An MIT paper at the time observed that "*the ordering patterns share a common, recurring theme: the variabilities of an upstream site are always greater than those of the downstream site*". Since then, industrial companies have invested vast amounts in improved demand forecasting, supply chain management and operational efficiencies, and significantly reduced this effect. The speed of the COVID recession and rebound in many markets however has been so quick that the supply chain simply could not react fast enough to the rebound in demand. As the old saying goes, a supply chain is only as strong as its weakest link.

Policy has also driven disruption – US trade tariffs applied in 2018 for example were already exposing supply chain fragilities even before COVID struck.

The supply/demand imbalance varies by sector but we expect to significantly normalize during 2022. While some bottlenecks are easing, for example semiconductors, we'd say conditions for logistics are sequentially worse in H2'21, as are certain material shortages.

## Implications

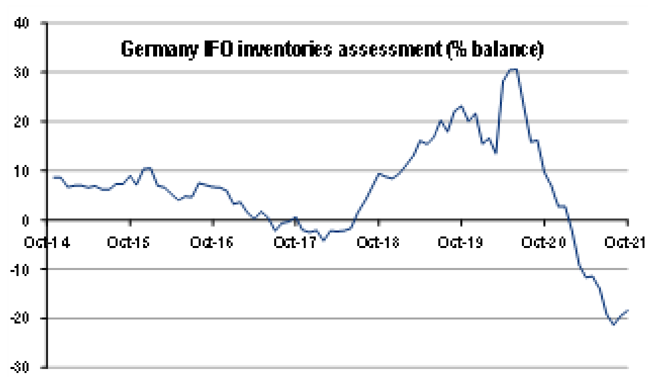
Pricing has generally picked up even in those industrial markets that are not normally seen as having the best pricing power – in general pricing has increased to offset higher material costs although the phasing (i.e. the lag of pricing following input cost increases) and the percentage recovery varies by sector.

We have not seen a meaningful increase in inventories since everything that can be produced is being shipped, and lead times are being extended – although there is clearly a debate as to whether future working capital levels will be structurally higher. The most recent survey from the IFO institute points to manufacturing inventory assessments picking up from the lows, but manufacturing lead times (as measured by the ISM survey) remain lengthy by historical standards. The lack of container supply, surge in costs, delays and all-round lack of reliability on delivery schedules has also helped increase demand for air freight.

Many companies have seen book/bill ratios – the ratio of orders to sales – extend to new highs as real demand (as measured by orders) remains elevated but the ability to deliver (as measured by revenue) is constrained.

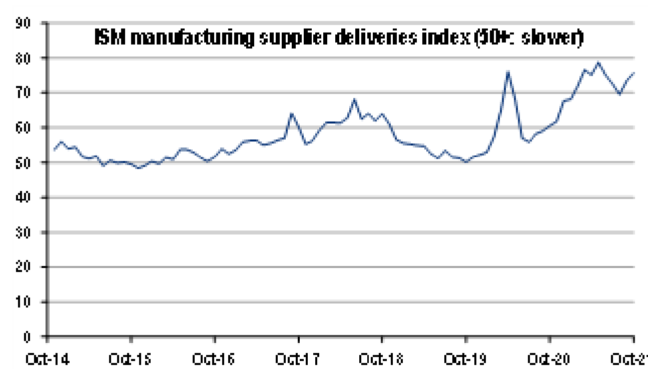
The imbalance of trade between Asia and the US has manifested itself in the increase in the number of empty container boxes going back from the US, hence the comment that one of the fastest growing exports from the US to Asia is air.

**Figure 11. The most recent survey from the IFO institute points to manufacturing inventory assessments picking up from the lows...**




Source: Citi Research, DataStream

**Figure 12. ... but manufacturing lead times (as measured by the ISM survey) remain lengthy by historical standards**




Source: Citi Research, DataStream

## Steps to relieve the stress – near term and longer term

Some of the products in short supply will continue to see structural demand growth in industrial markets well beyond the next year or two – as the Industrial IoT becomes more pervasive, semiconductor content will only increase; as the world electrifies, demand for certain enabling metals for conductivity or storage will also structurally increase. We expect governments to incentivize domestic supply chains for critical components and materials. In the US, the White House Supply Chain disruption task force lists semiconductors, raw materials, and batteries as three of its targeted industries. In Europe, a "European Chips Act" has been announced by the EC president to bolster semiconductor supply.

We have also seen (and expect to continue to see) companies forming longer dated partnerships with logistics partners.

We expect investments in automation and digitization, already major focus areas, to increase in order to increase efficiency and information flow. We would expect an accelerated pace of investment in "connected" industrial technology to be a relatively consistent theme going forward as companies remain focused on building resiliency and driving productivity gains.

In the container market, production of container boxes (mainly in China) will hit a new all-time record high in 2021 and shipping companies have also increased orders for container ships. The problem is that while the lead time for container boxes is measured in terms of weeks, the lead time for new ships is measured in terms of years. The ratio of new orders to the total fleet is at an eight year high but it will take until 2023 before supply begins to ease. And then there is the issue of the limited capacity of container ports with lead times for new construction extending up to ten years or more depending on planning permission, EIAs etc.

# What does the path to "normal" look like?

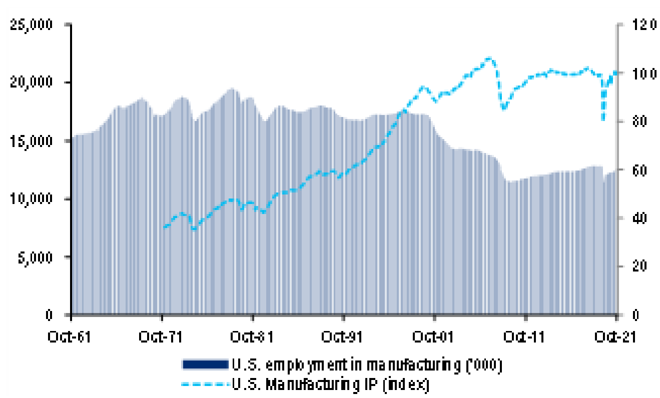
We expect suppliers in key areas to be adding capacity through 2022, although certain product areas (like semi-conductors) have long lead times. We expect some bottlenecks to ease from Q4'21 but the effects could linger throughout 2022 and into 2023 even.

Certain facilities are now being run 24-7, and normal seasonal slow periods may be used to rebuild inventories. The need to automate port facilities would also seem to be an absolute necessity.

## Employment implications

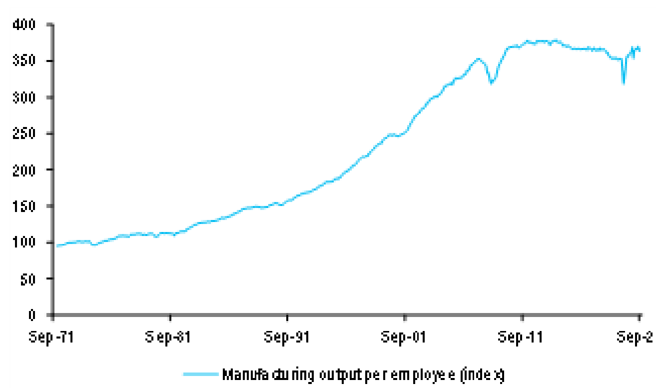
The industrial sector has already become much more "employee light" – in the US, real output per manufacturing employee is now almost four times what it was in the 1970s. Automation is seeing continued growth and we think any re-shoring of manufacturing to protect against supply chain disruptions would also be highly automated. We'd also expect automation penetration to increase in warehouse automation and logistics. In other areas like service, we are seeing remote servicing and other digital solutions significantly reducing the labour intensity of service for many industrial markets.

**Figure 13. The industrial sector has already become much more "employee light" – in the US…**




Source: Citi Research, DataStream

**Figure 14. … and the real output per manufacturing employee is now four times what it was in the 1970s**




Source: Citi Research, DataStream

## Bull and bear scenarios

Bear scenarios could include any resurgence of the pandemic that force capacity or transport closures, or if government policy to protect supply chains meets with any adverse reaction like a trade war.

A bull scenario could be that market forces drive capacity additions such that bottlenecks are eased, that the resulting inflationary pressures prove transitory, and that pent-up demand from unfulfilled orders in 2021 boost 2022 growth.

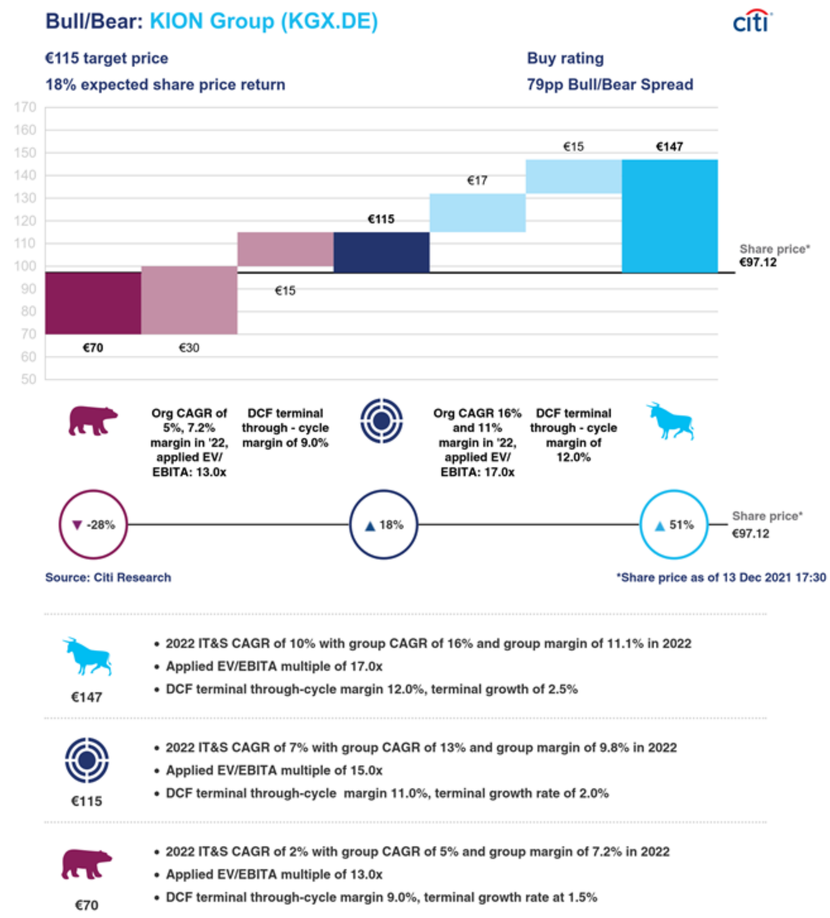
## Lessons

Real-time, global, diverse supply chains have massively reduced the cost of goods over the last 20 years, but arguably some of the risks have been exposed. We expect further investment in digitization (to get more information) and automation (to reduce the risk of future potential pandemics), and we also expect companies to increasingly form longer term partnerships for sourcing and logistics. We also wonder if the mantra of “Just In Time” will be replaced by “Just In Case”, with more companies carrying more inventory. Given the degree of congestion on the west coast of the US (especially outside Los Angeles / Long Beach), and the lack of any near-term fix within the next 6-12 months, we wonder if some Asian exporters will re-assess their own supply chains and look to increase capex in the US and also in Mexico.

## European Capital Goods

**KION (KGX.DE, Buy)** - Supply disruptions have led to full warehouses and a surge in warehouse construction, adding to an investment cycle already being driven by the long term eCommerce theme. KION is the #1 supplier globally for warehouse automation systems and #2 for material handling trucks. KION’s Supply Chain Solutions business supplies robotic palletizing/de-palletizing systems, storage systems, and sortation systems for warehouses, and has already seen its order backlog hit a record high in 2021. Penetration of automation in warehouses is less than 10%, leaving significant penetration upside. We expect the combined drivers of ongoing eCommerce penetration and higher investment in supply chain resiliency as potential key drivers for KION.

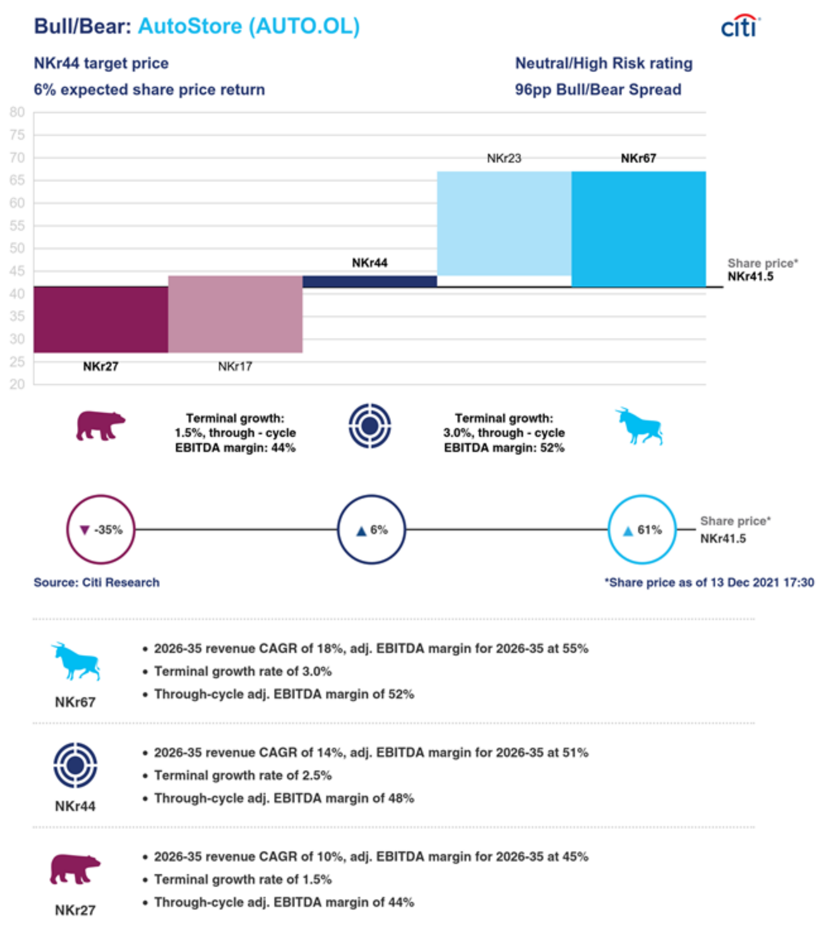
Figure 15. Bull/Bear: KION Group (KGX.DE)




Source: Citi Research

**Autostore (AUTO.OL, Neutral)** - AutoStore is a pure-play on warehouse automation, with a focus on cubic storage technology in the automated storage and retrieval systems (AS/RS) market, where it is by far the market leader in this small but fast-growing niche. Cubic storage is used in high density warehouses for goods that are physically smaller (in retail or smaller industrial products). While eCommerce fulfilment in apparel & sports has historically been the largest market, and micro fulfilment for grocery has the potential to be the fastest growing, third party logistics and industrial supply chain automation are increasingly important where Autostore’s technology can be used to increase supply chain efficiency

Figure 16. Bull/Bear: AutoStore (AUTO.OL)




Source: Citi Research

**Graeme McDonald**
Japan Capital Good Research
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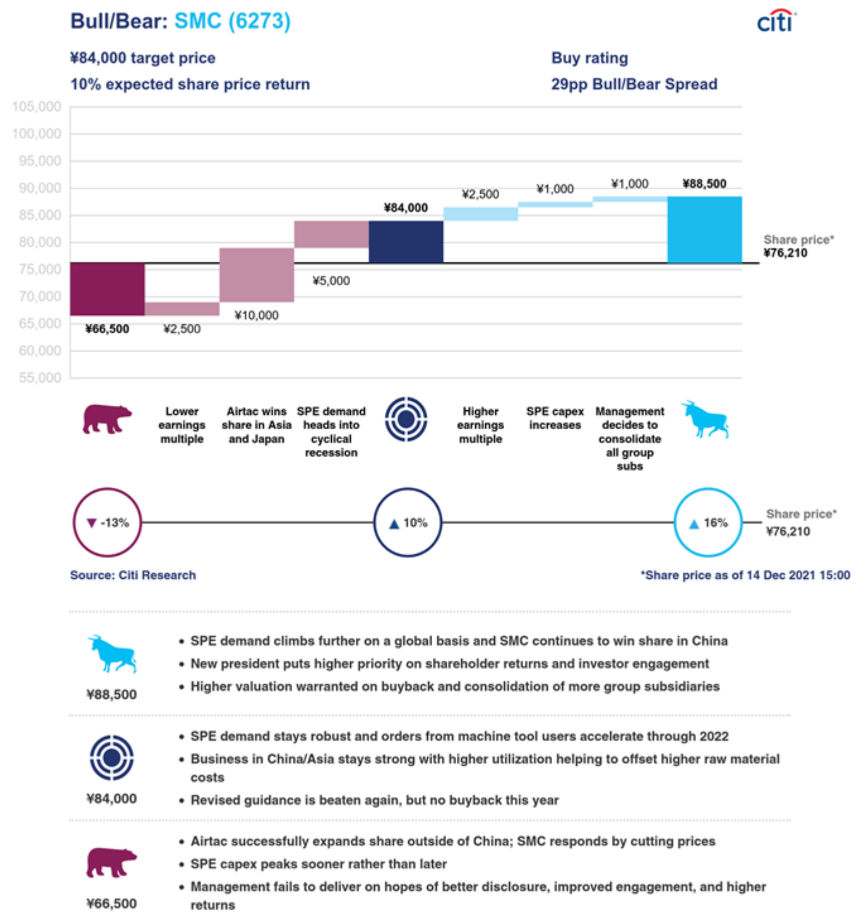
## Japan Capital Goods

**SMC (6273, Japan)** – One of the impacts of the supply chain bottlenecks will be a reassessment of how companies think about what is an appropriate level of inventory. The previous mantra of 'Just In Time' could be replaced by 'Just In Case' with some near-term pressure on FCF. As the top global supplier of pneumatic components SMC has long been seen as a beneficiary of the secular shift towards automation but many investors have pushed back on the name arguing that the company always held too much inventory (equivalent to >300 days sales as of the end of Mar-21). The company has long argued a high level of inventory allows them to deliver 70% of all orders within three days and it seems to us that over the past twelve months or so this high level of inventory has also enabled them to win market share from some of their 'leaner' competitors. The small size / light weight of its components also mean that if there are issues shipping from its main plants in Japan and China then air freight is a quick alternative. On top of this, when we consider that growing demand for semiconductors will also boost orders for SPE (semiconductor production equipment) which is the largest end market for SMC's products the company would seem to be well positioned to profit over the next couple of years.

**Figure 17. Bull/Bear: SMC (6273.T)**




Source: Citi Research

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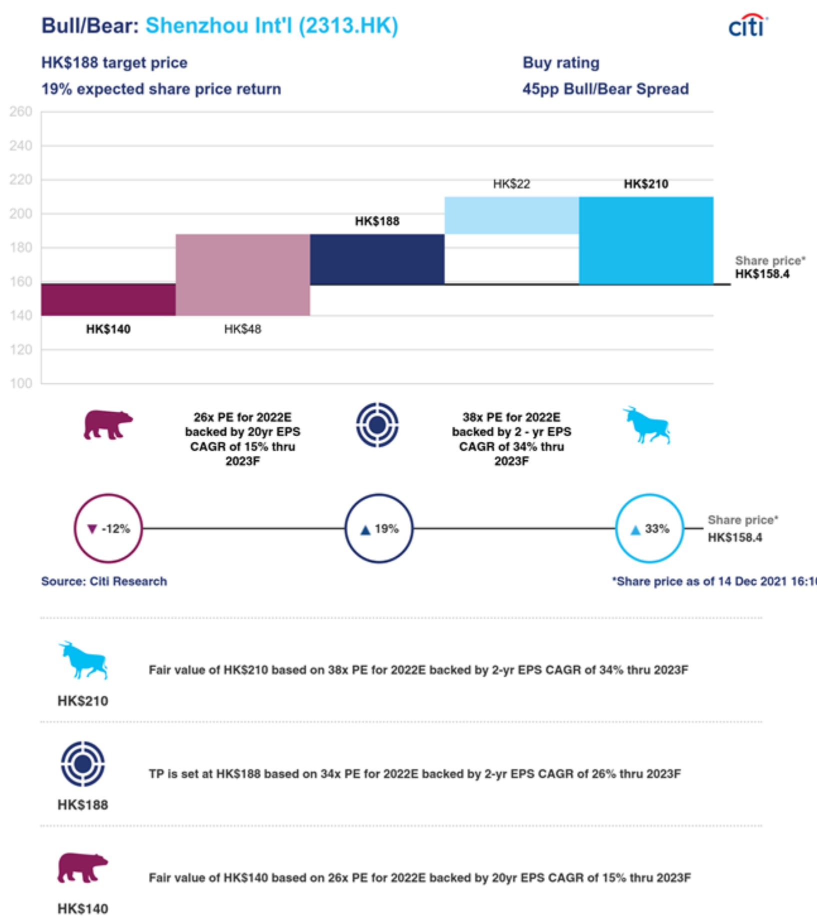
## Pan-Asia Industrials

**Positive impact:**

**Shenzhou (2313.HK, Buy)** – Shenzhou is the global largest sportswear mfg for Nike, Adidas, Uniqlo and Puma. Nike and Adidas mostly source of sportswear and footwear from Vietnam. The suspension of most factories in Ho Chi Minh, Vietnam has even caused Nike to cut FY22 guidance. Shenzhou factories in VN also suspended for a short while in Aug but resumed in Sep. At present, the utilization rate in VN factories has risen to 90-95% in Nov and the company targets to further raise to full productivity by end-Nov. Many of the rivals were suspended for a longer while and would take a longer time for resumption. As such, Shenzhou has been gaining more share in view of the recent supply chain shortage. We work out the estimated rev in 2021 would grow 19% against 2019 which has significantly outperformed most comps (like Crystal 2232.HK, Makalot 1477 TT ) with the ratio of flat to single-digit growth, and also outperformed its major customers Nike at ~14% and Adidas down 9% over the same horizon, according to Citi revenue forecasts for 2021.

Shenzhou Int'l (2313.HK) - What's New at China Conference: Faster Pace of Resumption in Vietnam

Figure 18. Bull/Bear: Shenzhou Int'l (2313.HK)

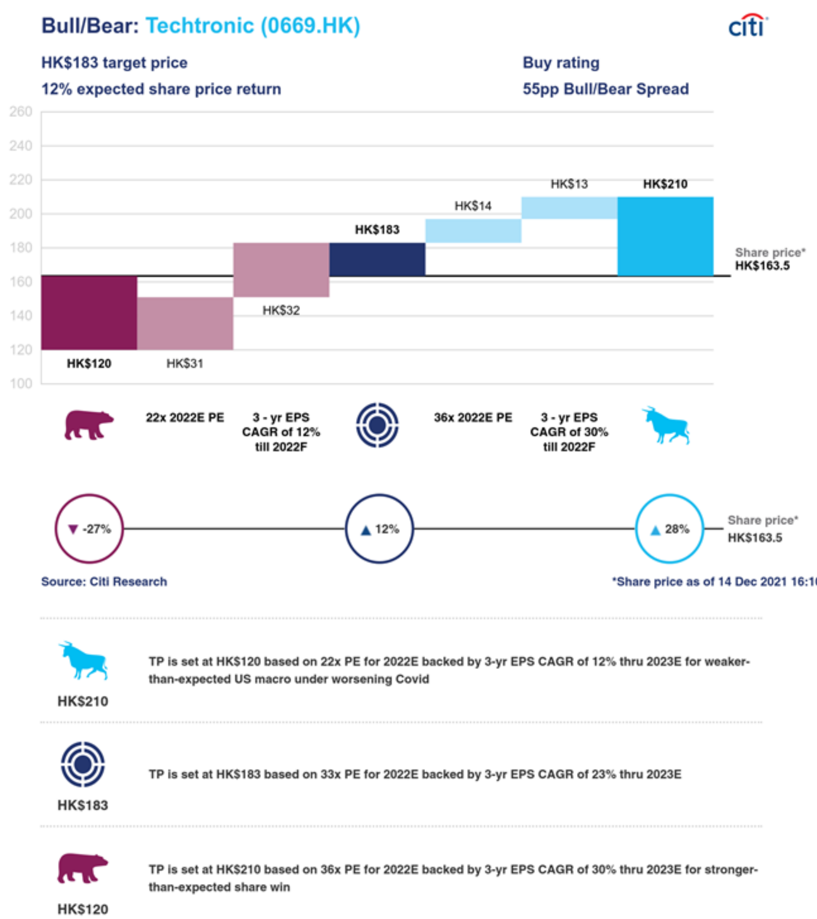



Source: Citi Research

**Techtronic (0669.HK, Buy)** – Techtronic is the global second largest power tools mfg with ~15% market share. Most of the peers faced challenges of supply chain disruption from the perspective of semiconductor (for Li-ion battery management system), insufficient material supply such as Li-ion battery cell, suspension of production in Cambodia during 2Q and Vietnam during 3Q along with shortage of containers for shipment from Asia into US/EU. Techtronic benefits from this supply chain shortage so that the company has inflated the ASP easily thru product mix upgrade during 3Q21 in order to fully offset the rising material cost. Additionally, the company has been gaining share more rapidly either such that the estimated 2021 rev over 2019 would be 71.3% against other direct comps of Stanley Black & Decker at 18.8%, Makita at 24.0% and Greatstar at 43.4% on 2-yr stack basis. Techtronic can get rid of most macro challenges due to earlier preparation of the supply chain constraints such as 1) extension into Chinese battery cell suppliers from mostly Korean before, 2) outsourcing business model in certain low-end products with greater flexibility for stable supply and 3) enhancement of internal control.

[Techtronic (0669.HK) - Increasing Conviction to Our Forecasts after 1H21 NDR Calls]

**Figure 19. Bull/Bear: Techtronic (0669.HK)**




Source: Citi Research

**Negative impact:**

**VTech (0303.HK. Sell)** – VTech is the global largest household telephony and electronic learning product (ELP) manufacturers under its own brand VTech. The FY21 revenue split was 18% on telephony, 41% on ELP and 41% on CMS (contract manufacturing services). The company has recently posted weaker-than-expected 1HFY22 results with 38% earnings decline along with flattish revenue growth. The flattish rev growth was mainly led by shortage of chipsets for both telephony and CMS segments. Mgmt suggests if no chipsets shortage issue, the revenue should have been 10-15% higher than reported line.  VTech see its chipset shortage will continue to sustain at least for 1HCY22.

VTech Holdings (0303.HK) - Not Out of the Woods Yet; Reiterate Sell

**Yue Yuen (0551.HK. Sell)** – YY is the global largest athletic footwear manufacturer with ~17% market share for almost all global brands like Nike, Adidas, Under Armour, Puma, New Balance. YY incurred loss of US$70.7m during 3Q21 results due primarily to suspension of virtually all factories in Ho Chi Minh, Vietnam for city lockdown. The VN factories altogether accounted for ~45% of total output in 2020. The factories in VN started to resume from late Sep but mgmt. believes the utilization rate would go back to 70-80% (above breakeven level) in 1Q22 at the earliest. In addition, the workforce density for footwear production is almost 5X higher than apparel production. As such, HCM govt requires more measures for footwear factory over the resumption against apparel factory.

Yue Yuen Industrial (0551.HK) - Loss Making for 3Q21 Results; Reduce TP to HK$13.5

## US Industrials

**Andrew Kaplowitz**
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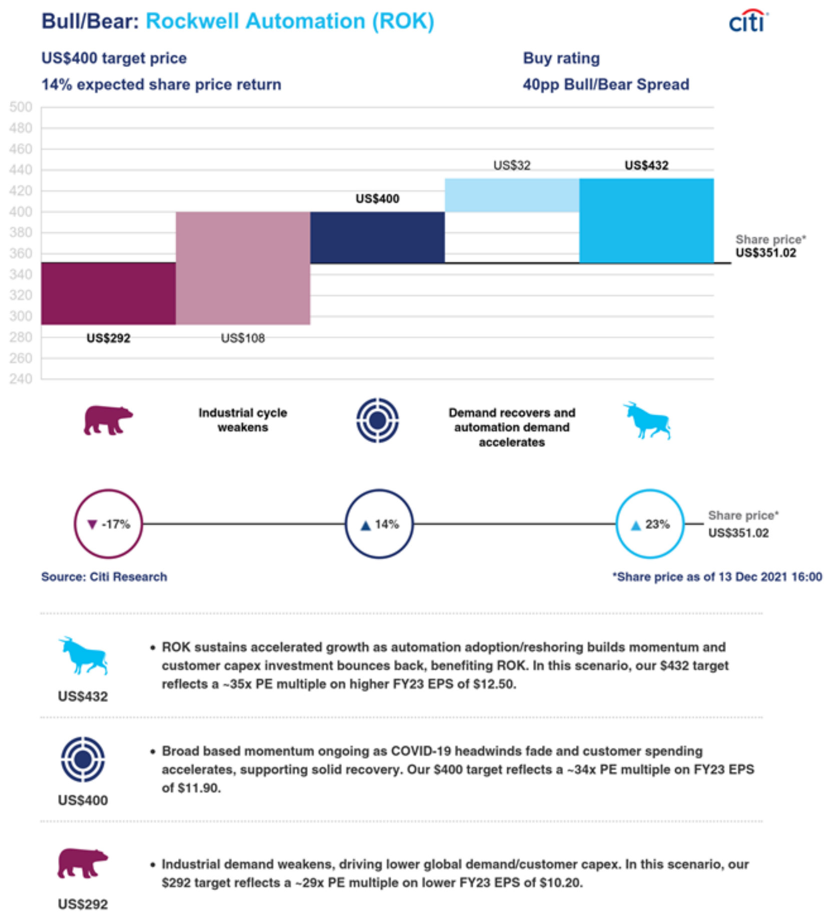
**ROK.N** - We think Rockwell Automation (ROK) is ideally positioned to provide automation/digital solutions that could improve efficiency/productivity to its customers faced with a myriad of supply chain inefficiencies. ROK is the largest U.S. pure-play automation-focused company with significant expertise in automation-focused supply chain management. ROK's software and cloud-native solutions can improve agility, resiliency, and sustainability within manufacturing supply chains. Moreover, as potential manufacturing customers seek to improve their supply chain resiliency by establishing more "local-for-local" operations, we think these customers will increasingly turn to ROK's automation, especially given ROK's integrated information technology/operational technology offerings offer a quick payback/return in a higher logistics/labor cost environment.

Rockwell Automation (ROK.N) - ROK - Innovating to Drive LT Earnings Growth

North America Diversified Industrials - Proprietary Manufacturer Survey Supports Bull Case For Automation End Market

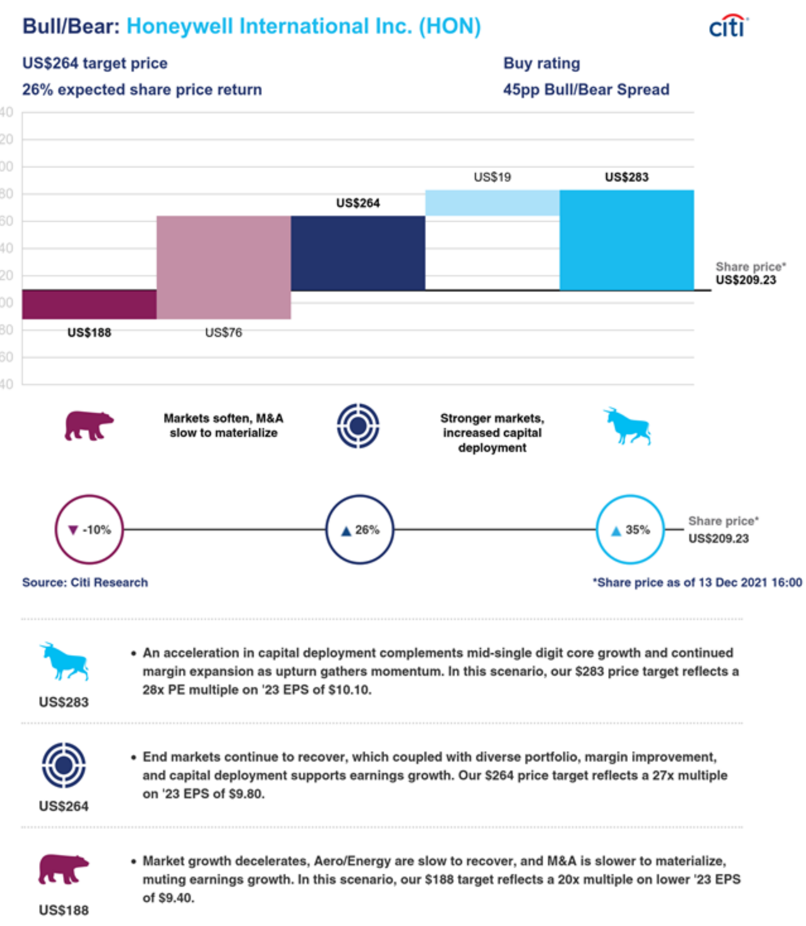
Figure 20. Bull/Bear: Rockwell Automation (ROK.N)




Source: Citi Research

**HON.O** - Honeywell (HON) through its Intelligrated warehouse automation solutions platform can help ameliorate supply chain/labor challenges created by significant SKU growth and strong global package-related demand. HON is a diversified global leader in the manufacturing of aircraft components and technology as well as offering building solutions, automation control, and safety and productivity solutions, with respect to supply chain management. We think HON's Intelligrated warehouse automation products and solutions in particular seem well positioned to continue to benefit from a significant build-out in automation within warehouses/distribution centers that expedite the throughput of products through global supply chains. HON offers advanced material handling systems to reduce the time and labor costs associated with inbound processing, sortation systems to support shipping activities, as well as smart, flexible palletizing solutions. We think given continued high rates of warehousing/distribution center growth as well as customers' increasing preference for higher levels of automation within their warehouses/DCs that HON will stand to benefit.

Figure 21. Bull/Bear: Honeywell International Inc. (HON.O)




Source: Citi Research

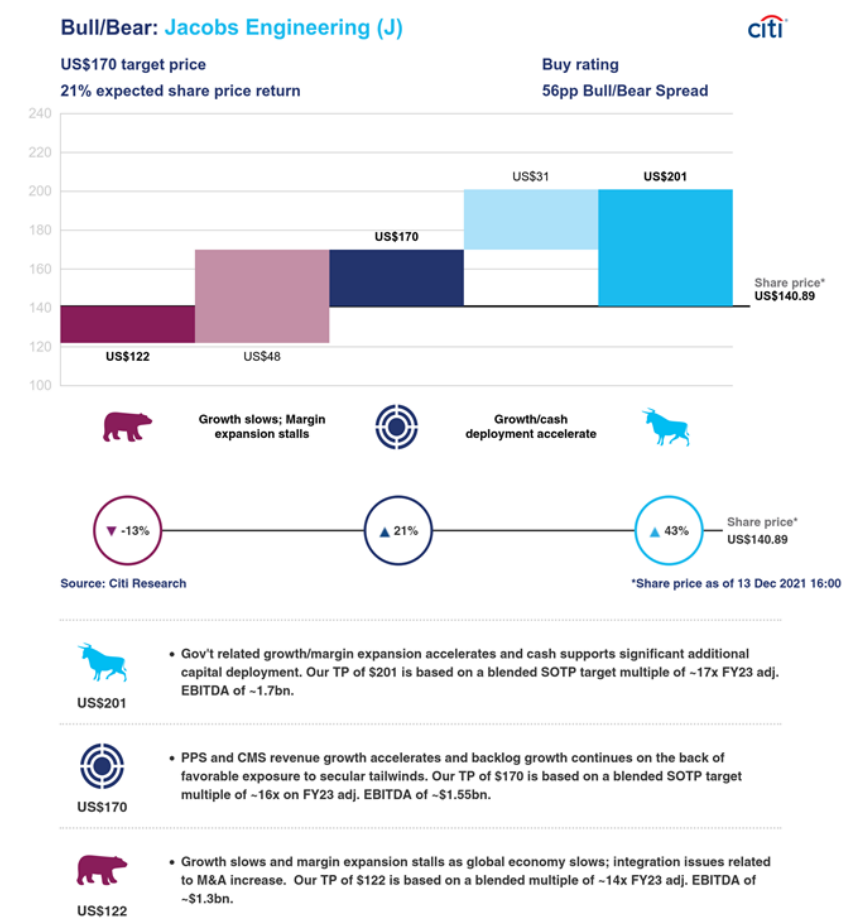
**ACM.N** - Aecom (ACM) as a global infrastructure design and consulting firm can offer solutions to customers to improve the efficiency/footprint of their supply chains. ACM through its Buildings + Places practice supports all stages of asset management for its customers, ensuring optimal asset efficiency. Given global supply chain pressure is leading customers to question their own supply chain footprint, we think they will increasingly turn to ACM to understand the efficiency, resiliency, and sustainability of their footprint. Furthermore, as customers reassess whether they need more “local-for-local” manufacturing/supply chain footprint, we think they will increasingly turn to ACM to help design new facilities.

Aecom (ACM.N) - Well Positioned to Think and Act Globally

**J.N** - Jacobs (J) provides a full spectrum of professional services including consulting, technical, scientific and project delivery for the government and private sector. J’s Advanced Facilities business in particular is helping customers in end markets such as Life Sciences and Semiconductors (as well as others) navigate through historically high demand for their products by helping them design new state-of-the art local-for-local manufacturing footprint. J offers sophisticated digital tools to help maximize facility investment and improve supply-chain efficiency for these customers who are faced with increasingly complex decisions regarding where and how to set up incremental capacity. Given we see particular growth in "reshoring" in Life Sciences and Semiconductors/Electronics, where we think J has leading consulting market share, we expect J's sales/earnings to continue to accelerate in this area.

Jacobs Engineering (J.N) - J Appears Ready to Reinvent Tomorrow

Figure 22. Bull/Bear: Jacobs Engineering (J.N)




Source: Citi Research

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## US Machinery & Diversified Industrials

Supply chain challenges have been broad-based and negatively impacted companies across the U.S. Machinery sector. These bottlenecks have caused parts shortages and delays, leading to factory inefficiencies and forcing material cutbacks in the production of finished goods for most companies. The industrial economy in general has strengthened order flow and is solid but manufacturers are simply unable to keep finished inventory on hand and/or can't produce enough finished product to satisfy current demand. For many companies, it has led to lost sales due to an inability to ship. The companies that have kept production lines running like truck maker Paccar (PCAR) have been building WIP inventory that is missing several components and unable to ship to dealers. For example, Paccar at the end of the 3Q had over $2B in WIP and 52 days of total inventory versus 25-27 days normally. A secondary effect of supply chain bottlenecks has been higher freight / logistics costs that have further negatively impacted margins. Most management teams expect little improvement to supply chain challenges in 4Q and only gradual improvement in 1H22, though visibility is extremely limited.

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## India Autos

Vehicle manufacturers (Auto OEMs) are essentially assemblers of parts. Some of these parts used in vehicles assembly might be built at the OEM's in-house manufacturing facilities while rest of the parts (often constituting the majority) are made at the plants of various suppliers located either in the vicinity of the OEM's facility or in a distant location. The part makers as well as the OEMs aspire to have the optimum level of inventory at their plants. Thus, both categories of stakeholders rely a lot on an efficient supply chain.

Some of the Indian auto OEMs also are major exporters. Thus, ocean freight becomes an important part of the supply chain from a pant-to-market perspective rather than a manufacturing perspective. Similarly, some auto part makers also export component to vehicle assemblers outside India and thus are heavily reliant of smooth logistics.

To identify the importance of smooth supply chain and implications of disruptions, we can analyse the Indian auto and auto parts companies under three categories-

**1) Impact of disruption in import supply chain**

Indian OEMs do rely on imported components despite the big focus on indigenization. While the component manufacturing ecosystem in India is very well developed in terms of manufacturing capacity as well as technology, there are still components that need to be imported. These imports might be either done directly by the OEMs or by the part suppliers (who import sub-components). Any disruption in the supply chain, including, but not limited to, ocean transportation to Indian ports, rail/road transportation from ports to plants etc can cause disruption in production.

The recent global container shortage resulted in hindering the manufacturing operations at various plants. Some companies had to resort to airlifting of critical components so that the output is impacted to the minimum extent. However, this resulted in escalated cost pressures, impacting profitability.

The global chip shortage is more of a manufacturing capacity problem rather than a supply chain problem. However, there were vendor specific issues when the supplier could not get the chips due to supply chain disruption in specific geographies.

**2) Impact of disruption in exports supply chain**

Indian OEMs like Bajaj Auto (BAJA.BO), TVS Motor (TVSM.BO) and Maruti Suzuki (MRTI.BO) rely on smooth ocean freight availability. Any disruption in ocean logistics can be detrimental to such companies. Mgmts of both Bajaj Auto and TVS Motor have noted in recent calls that lack of container availability had impacted export dispatches.

Component makers who export to global markets have also faced shortfall in dispatches (and hence revenue) due to supply chain issues. The recent container shortage is one such example.

An interesting case of necessity of smooth supply chain is that of Balkrishna Industries (BLKI.BO). Almost 80% of its volumes is exported with Europe accounting for 50-55% and Americas accounting for 15% of total volumes. With strong demand expectations in the Americas and the high transportation time (almost 2 months), the company planned to open a manufacturing facility in the US and announced capex of up to US$100mn in Sep’2018 (link to our note). Investors’ reaction was fairly negative to the announcement and was reflected in the stock price reaction.

However, given the decline in demand over subsequent months, the company finally shelved the plan to open the plant in the US. See our note: 1Q Hit By Weak Global Demand; US Capex In Abeyance

**3) Impact of disruption in domestic supply chain**

India has various “auto-hubs” with an ecosystem comprising of auto part makers and OEMs. While a majority of part makers are in the vicinity of the OEM (thus many part makers have multiple plants), often OEMs do procure parts from vendors which are located further away. Additionally, manufactured vehicles also need to be sent to dealers across the country. A solid domestic supply chain is thus an essential for maintaining the demand-supply balance.

The supply chain within the country can be impacted by a gamut of possible factors. Below, we highlight a few

**i) Weather related disruptions** – Floods, incessant rains etc can derail normal manufacturing activities and transportation. An example was the unfortunate floods in Kerala in 2018, which impacted production in plants located in the state (Apollo Tyres) and even demand in the state- esp for Eicher Motors which has a disproportionately high demand originating from the state. Kerala is the largest producer of natural rubber in India and the floods severely impacted rubber supply

**ii) Covid related issues** – The unfortunate Covid 19 outbreak not only caused loss to invaluable human lives but also impacted the industrial operations. Since the spread of Covid was worse in certain states than others, there was a significant demand supply mismatch. Also, restrictions on movement were implemented by state and sometime even local bodies. Thus, movement of goods was impacted severely.

**iii) GST- a positive** – GST (Goods and Services Tax) has enabled a significant consolidation in warehouses. Moreso, with trucks carrying components/vehicles not being stopped at state borders for time-consuming procedures, GST has significantly reduced transit times.

Citi’s take- The automotive sectors literally move the country. However, given the geographical spread of a country like India and presence of manufacturing facilities of OEMs/part makers across the country, a smooth supply chain is extremely important. The focus of companies to minimize inventory further burdens the various stakeholders in the supply chain. A failure of any link can render the whole chain ineffective and cause significantly loss to the companies.

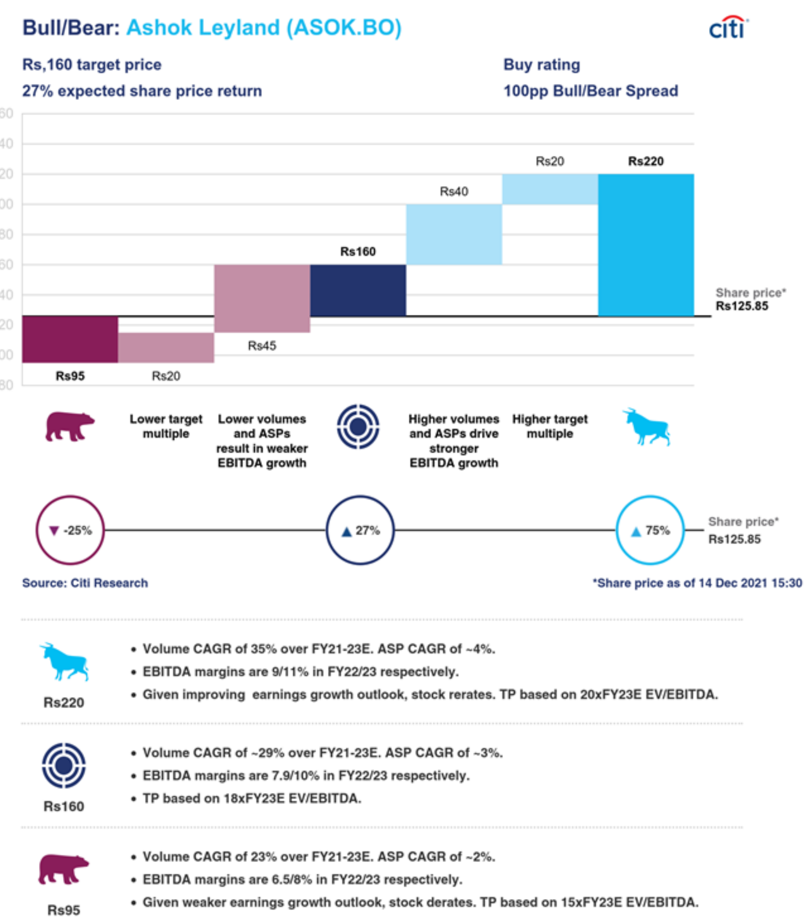
**Companies in the Indian auto sector that are solution providers in Supply Chain management:**

**Ashok Leyland (ASOK.BO)** - A pure play on the Indian commercial vehicle space. In India, road transportation is one of the most important in land logistics medium. Inland waterways are underdeveloped, air cargo is expensive and trains are not time-efficient (though indispensable for bulk cargo). As inter-state road transport improves from a sharp downtick due to Covid, we see the cycle reversing and Ashok Leyland stands to benefit. Additionally, the company is making a big foray into the light commercial vehicles (LCV) segment, where proliferation of e-commerce, rural income growth and last mile connectivity are likely to be key drivers. Ashok Leyland is our #2 Buy in the Indian auto space (after Maruti Suzuki).

Ashok Leyland (ASOK.BO): Takeaways from Citi India Autos Investor Trip 2021

Ashok Leyland (ASOK.BO): 2QFY22 Results First Cut – Margin Disappoints Due To Weak Realisations And Mounting Raw Material Cost Pressures

Figure 23. Bull/Bear: Ashok Leyland (ASOK.BO)



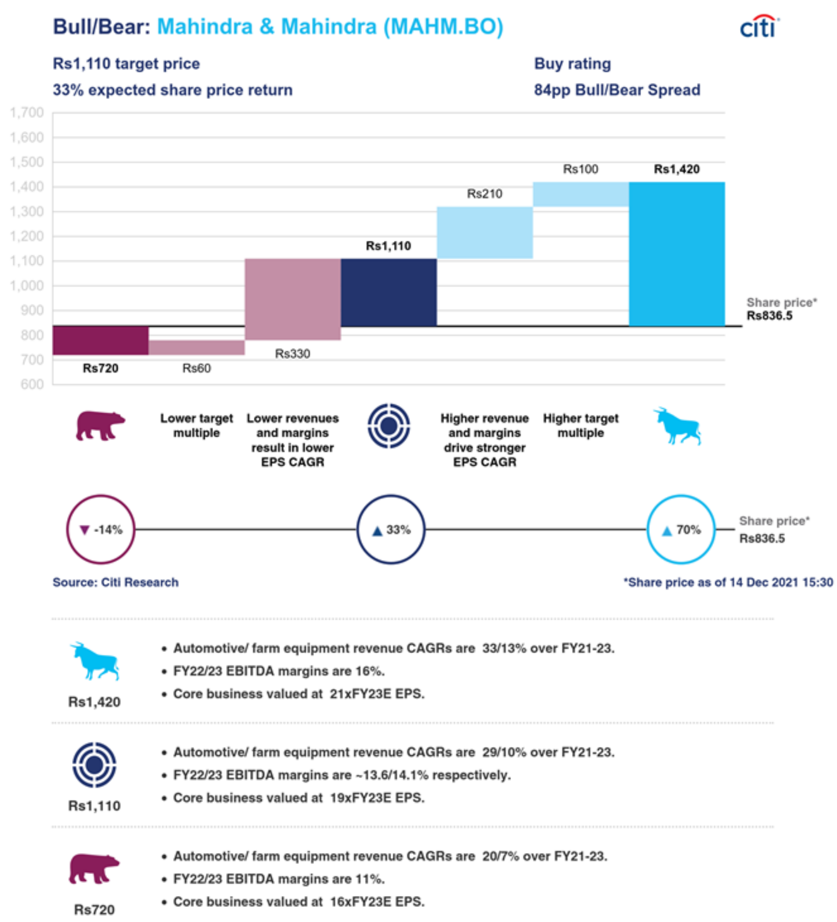

Source: Citi Research

**Mahindra & Mahindra (MAHM.BO) -** One of the top two players in the LCV (Light Commercial Vehicles) segment. Mahindra stands to gain from e-commerce, last mile connectivity and rural demand. Specifically for rural demand, given M&M has a very strong presence in rural India (due to its dominant position in the agricultural tractor segment).

Mahindra & Mahindra (MAHM.BO): 2QFY22 Results: Slight Operational Miss

Mahindra & Mahindra (MAHM.BO): Takeaways from Citi India Autos Investor Trip 2021

**Figure 24. Bull/Bear: Mahindra & Mahindra (MAHM.BO)**




Source: Citi Research

## Companies in the Indian auto sector that are impacted by disruptions in Supply Chain

***As stated earlier, almost all OEMs and most part makers are impacted by disruptions in supply chain. Below, we highlight companies that are additionally impacted by issues in outbound logistics – mainly exporters which rely on sea-transportation.***

**Bajaj Auto (BAJA.BO):** Bajaj Auto is one of the major 2W makers in India. The company derives nearly half of its revenue from exports (Africa being the major market). Any disruption to global sea-transportation impacts the company's dispatches. The recent container shortage has resulted in lower than optimal export revenue for Bajaj Auto.

Bajaj Auto (BAJA.BO): 2QFY22 Results Slightly Below Estimates, Adjusted for One-offs

Bajaj Auto (BAJA.BO): Takeaways from Citi India Autos Investor Trip 2021

**Balkrishna Industries (BLKI.BO):** Balkrishna Industries exports nearly 80% of its volumes. Hence, any disruption in sea-transportation is likely to negatively impact its sales.

Balkrishna Industries (BLKI.BO): 2QFY22 Results Ahead of Estimates As Demand Remains Strong

Balkrishna Industries (BLKI.BO): The Big Tyre Rolls On- Maintain Buy on Healthy Demand Trends

**Bharat Forge (BFRG.BO):** Bharat Forge's export revenue accounts for almost 60% of its standalone revenue. Thus, a disruption in logistics (mainly seas transportation) is negative for the company's overall performance.

Bharat Forge (BFRG.BO): 2QFY22 Results Ahead of Estimates

## Global Transportation & Shipping

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There are some signs that we're at/past the peak of congestion, with potential for progress in the coming months. As such, we think it makes sense to put on the "no empty shelves trade." Within our Transport coverage we think better fluidity would be positive for the rails, as it could unlock volume which would be moving at higher prices, and reduce congestion related costs. We continue to prefer the eastern rails, CSX and Norfolk Southern due to export coal exposure (in addition to this dynamic) but believe Union Pacific would also benefit, particularly given its exposure to WC ports. We also think intermodal player JB Hunt would be a key beneficiary, as better rail service and a large container fleet could drive strong volume gains in 2022. Finally, an improving supply chain and particularly any regulatory moves that could result in incremental capacity would be negative for truckload carriers.

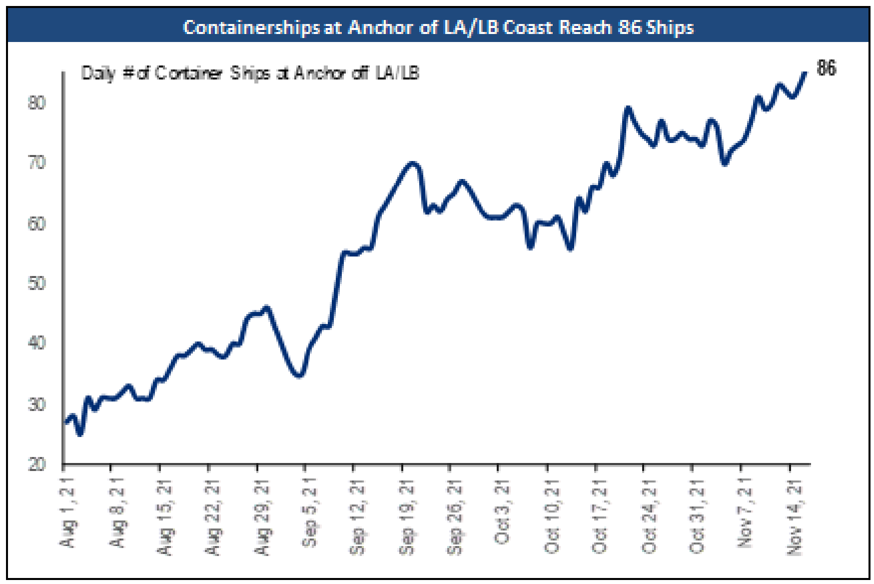
### Dwell is the Issue

For a container to reach a retail distribution center and ultimately to a store's shelves there are multiple legs in the journey starting with the ocean move. A vessel from Shanghai to LA takes about 12 days of sailing time. This has not changed materially since the bottlenecks began a year ago. The box takes ~4 days to unload then dwells in a container terminal at the port for 4 days typically. This is followed by ~2 days in an inland yard and another 2 days at the distribution center. Currently, unload times are ~8 days, the dwell at the port terminal is up to ~8 days, while the dwell at the inland yard and DC are both ~4 days. So what should be a ~22 day process has broken down to a nearly a 35 day process…then the empties need to come back, which is another issue unto itself.

Chassis are in short supply and are running at ~25% of optimal utilization due to congestion. So at each leg of the chain, dwell time is a problem. This is why 24 hour operations at the port are not likely to fix the problem. Relaxing hours of service could help, but is politically challenging. What appears to be the biggest issue is space, as terminals are full and empties need to be offloaded from chassis for loaded boxes to be picked up. So the southern California ports are actively adding space for empty returns, which is helping, but is far less than is needed for the growing stacks.

High demand and a lack of excess space at the ports has forced ships to idle, at-anchor off the coast. Containerships anchored off the coast of LA and Long Beach were up 6.2% WoW to 86 ships. So far, in November, 86 ships off the coast sets a new high, up 153% YTD and up 856% from its late-June lows.

**Figure 25. Containerships Anchored Off the Coast of LA/LB**




Source: Citi Research, Marine Exchange of Southern California

## Dwell Fees Are Working

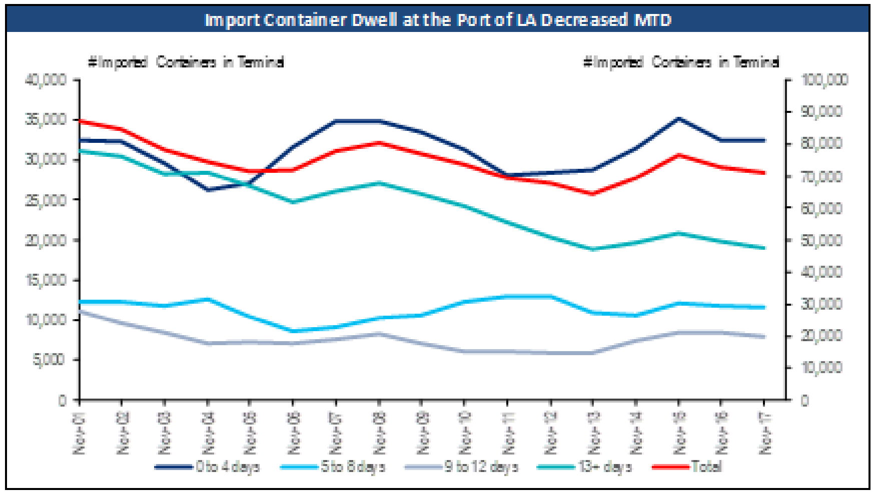
The Port of Los Angeles announced a $100 per container fee for boxes dwelling more than 9 days for truck moves and 6 days for rail moves, with the penalty ramping up to $100 per day beyond the initial grace period. The fee has been postponed just before implementation in mid-November due to progress at the port's terminal. Dwell times are down 18.4% on average since November 1 and long dwelled boxes have fallen 36.2%. We've heard anecdotal commentary that larger retailers, who traditionally let boxes sit longer, have been responsive to the fees and have begun to clear some of the backlog of containers. It's unclear how much incremental fluidity this will create, but it's a constructive sign amidst a challenging situation.

**Figure 26. Import Container Dwell at the Port of LA by Days**

| Container Dwell Days LA | Nov-01 | Nov-02 | Nov-03 | Nov-04 | Nov-05 | Nov-06 | Nov-07 | Nov-08 | Nov-09 | Nov-10 | Nov-11 | Nov-12 | Nov-13 | Nov-14 | Nov-15 | Nov-16 | Nov-17 | % MTD |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 to 4 days | 32,390 | 32,353 | 29,622 | 26,196 | 27,087 | 31,608 | 34,768 | 34,910 | 33,497 | 31,280 | 28,182 | 28,452 | 28,784 | 31,465 | 35,168 | 32,529 | 32,446 | 0.2% |
| 5 to 8 days | 12,278 | 12,285 | 11,792 | 12,576 | 10,486 | 8,529 | 9,171 | 10,207 | 10,649 | 12,261 | 12,949 | 13,055 | 10,920 | 10,687 | 12,200 | 11,786 | 11,566 | (5.8%) |
| 9 to 12 days | 11,150 | 9,598 | 8,474 | 7,110 | 7,316 | 7,097 | 7,669 | 8,245 | 7,131 | 6,052 | 6,071 | 5,985 | 5,980 | 7,482 | 8,392 | 8,475 | 8,009 | (28.2%) |
| 13+ days | 31,127 | 30,487 | 28,243 | 28,490 | 26,704 | 24,802 | 26,106 | 27,071 | 25,802 | 26,158 | 22,302 | 20,426 | 18,817 | 19,654 | 20,857 | 19,904 | 18,964 | (39.1%) |
| **Total** | **86,945** | **84,683** | **78,131** | **74,378** | **71,493** | **72,036** | **77,710** | **80,433** | **77,079** | **75,751** | **69,504** | **67,918** | **64,501** | **69,288** | **76,613** | **72,694** | **70,985** | (18.4%) |
| Longer Dated (9+ days) | 42,277 | 40,085 | 36,717 | 35,600 | 34,020 | 31,899 | 33,775 | 35,316 | 32,933 | 32,210 | 28,373 | 26,411 | 24,797 | 27,136 | 29,249 | 28,419 | 26,973 | (36.2%) |
| *as index* | *100* | *95* | *87* | *84* | *80* | *75* | *80* | *84* | *78* | *76* | *67* | *62* | *59* | *64* | *69* | *67* | *64* | |

Source: Citi Research, Port of Los Angeles

**Figure 27. Long Dwelled Boxes Have Decreased This Week at the POLA**




Source: Citi Research, Port of Los Angeles

## Chinese New Year Remains the Target

Nearly all industry participants express optimism that the current congestion will linger until there is a dip in demand. Most flag CNY as a possible period of reduced demand as vessel calls typically fall for ~2 weeks. However, there is some concern at the port that labor availability, particularly warehouse workers and drayage drivers, will be reduced following Thanksgiving when freight typically decelerates. Decongestion only works when capacity remains elevated even if/when demand slackens.

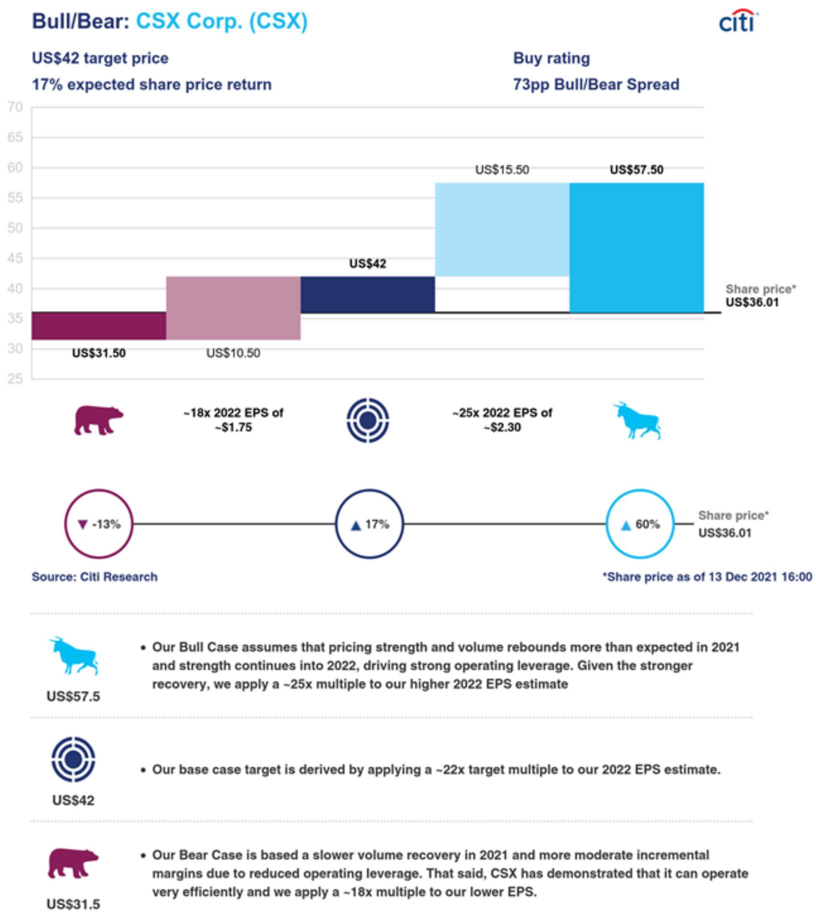
## Top Supply Chain Levered Picks From Around the Globe

### In the US Focus on Rail and Intermodal

As we noted, within our Transport coverage we think better fluidity would be positive for the rails, as it could unlock volume which would be moving at higher prices, and reduce congestion related costs. We continue to prefer the eastern rails, CSX and Norfolk Southern due to export coal exposure (in addition to this dynamic) but believe Union Pacific would also benefit, particularly given its exposure to WC ports.

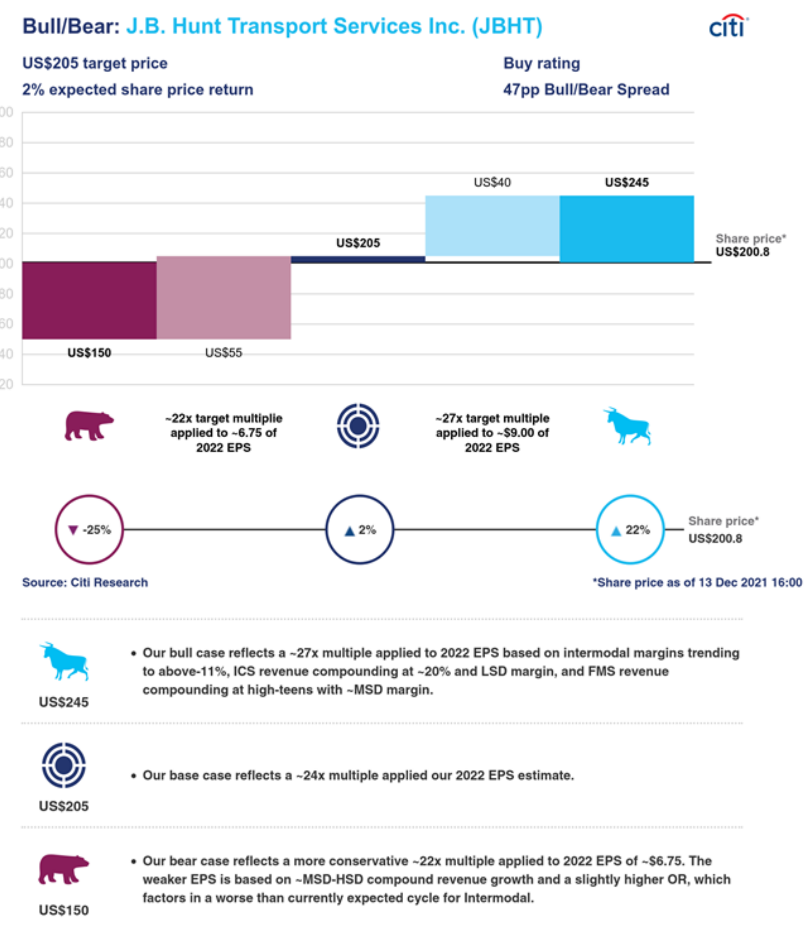
We also think intermodal player JB Hunt would be a key beneficiary, as better rail service and a large container fleet could drive strong volume gains in 2022. Finally, an improving supply chain and particularly any regulatory moves that could result in incremental capacity would be negative for truckload carriers.

**Figure 28. Bull/Bear: CSX Corp. (CSX.O)**



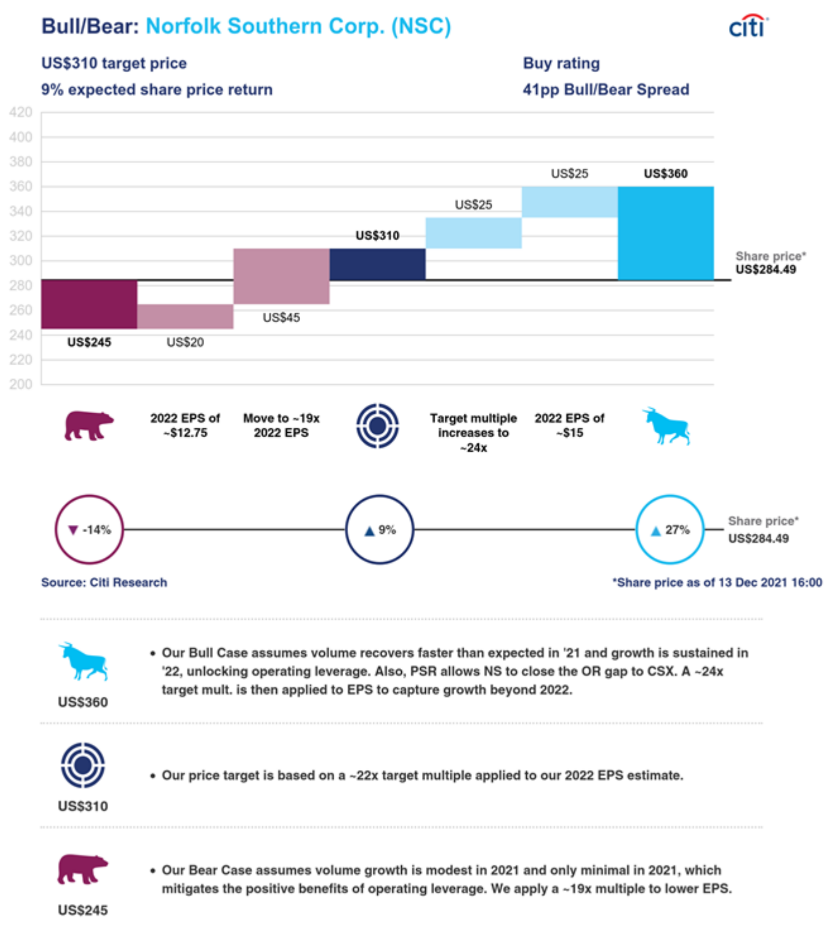

Source: Citi Research

Figure 29. Bull/Bear: J.B. Hunt Transport Services Inc. (JBHT.O)



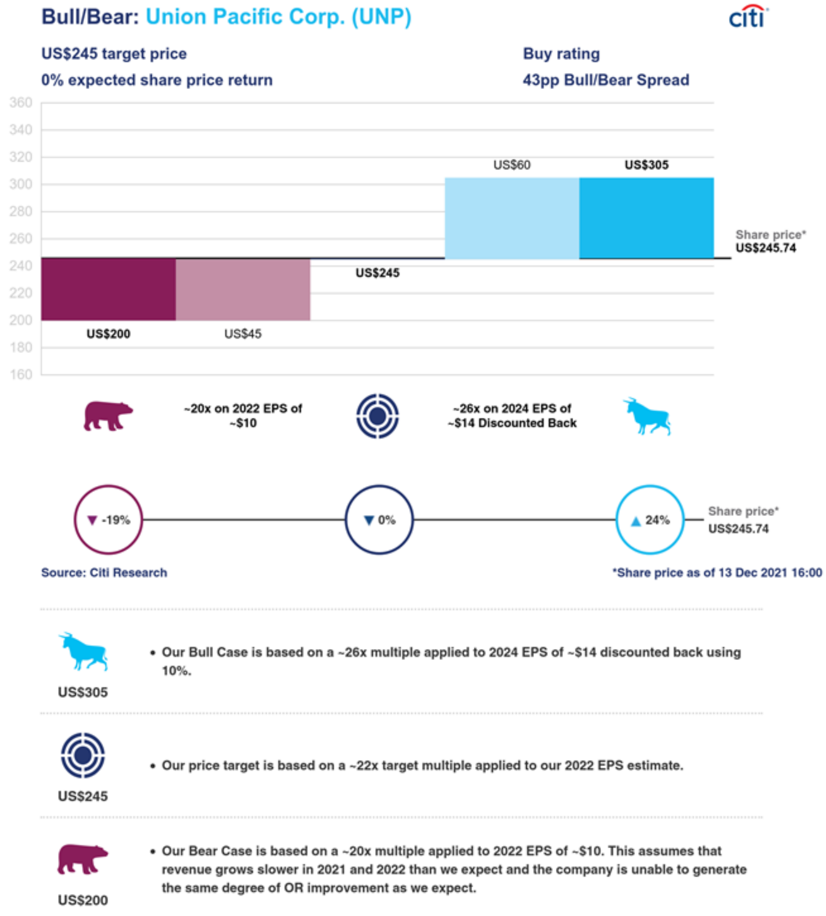

Source: Citi Research

**Figure 30. Bull/Bear: Norfolk Southern Corp. (NSC.N)**




Source: Citi Research

Figure 31. Bull/Bear: Union Pacific Corp. (UNP.N)




Source: Citi Research

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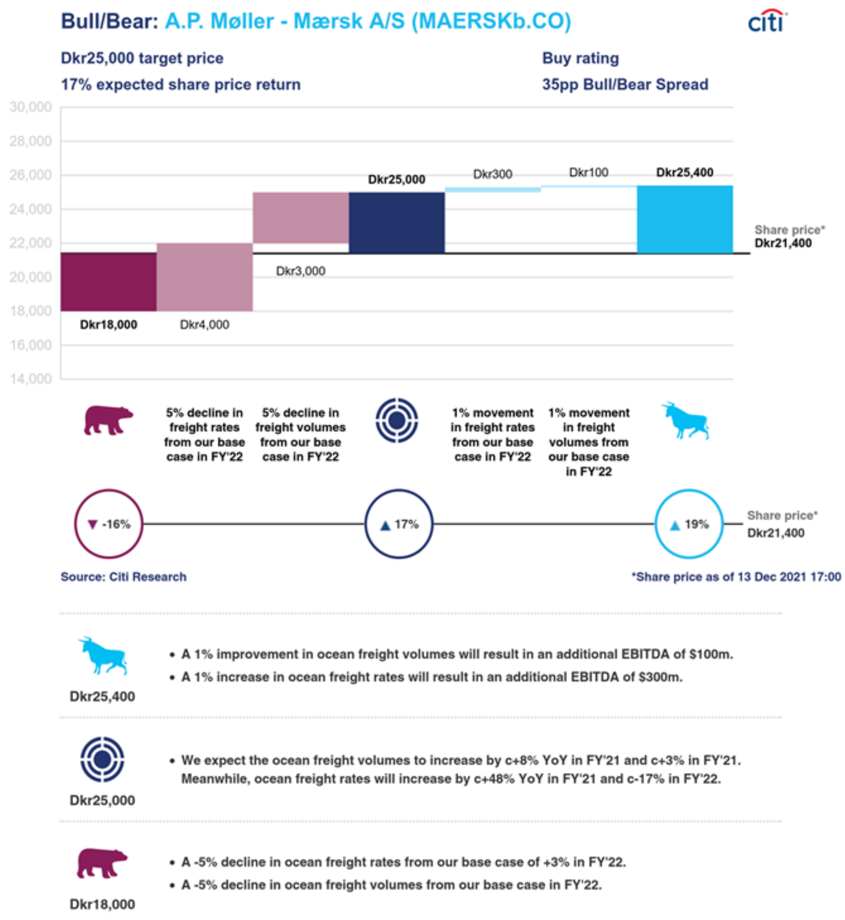
## In Europe Focus on Liners and Forwarders/Express Players

In Sea freight, we see the port congestion is driven by bottlenecks in sea and land-side. Specifically, the land side bottleneck is spread across Europe and North America and it is mainly driven by labor shortages in the inter-modal operations. The container turn around on land side is up 3X in US and 2X in Europe versus 2019. Hence, we see any normalisation in congestion will be between three to six months. Thus the rates will remain at elevated levels. We see Hapag Lloyd, Maersk and ZIM as beneficiary of rates remaining at elevated levels for longer.

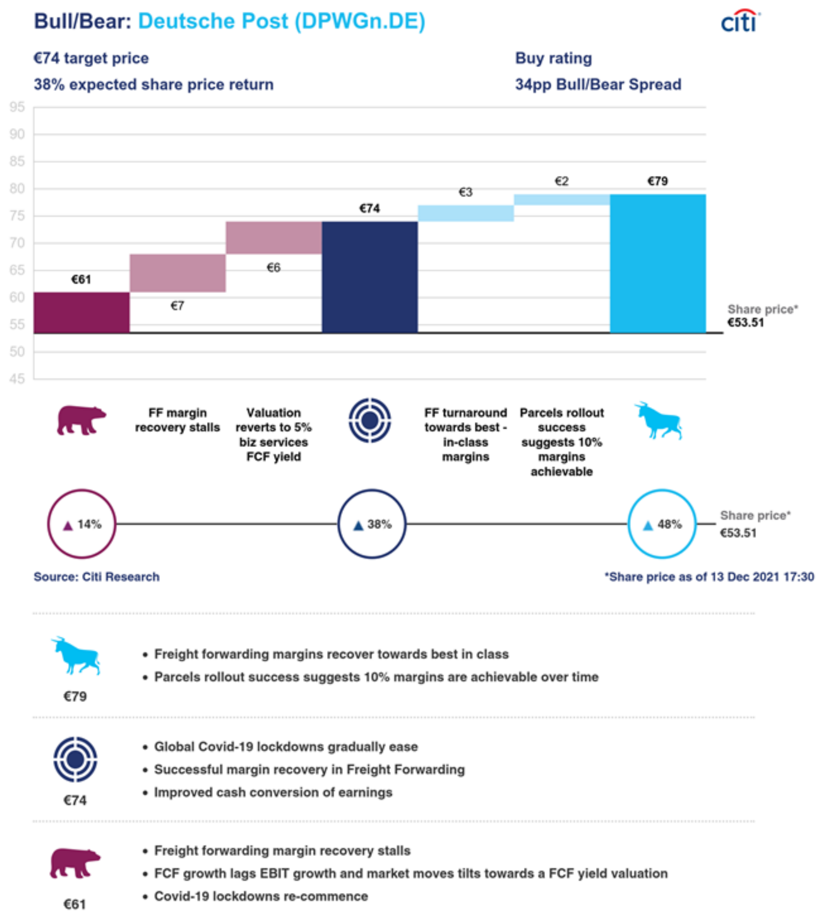
In the air freight segment, we expect the slow recovery in the long haul air travel over the winter will result in a tight supply dynamics ahead of the Q4 peak season. We believe the air freight market will continue benefit from the bottleneck in sea freight. Hence, we believe the dedicated air freight carriers will benefit from these favorable supply dynamics. Hence our top pick for the tight air freight market is DP DHL given it's exposure to freight forwarding and express segments.

Figure 32. Bull/Bear: A.P. Møller - Mærsk A/S (MAERSKb.CO)



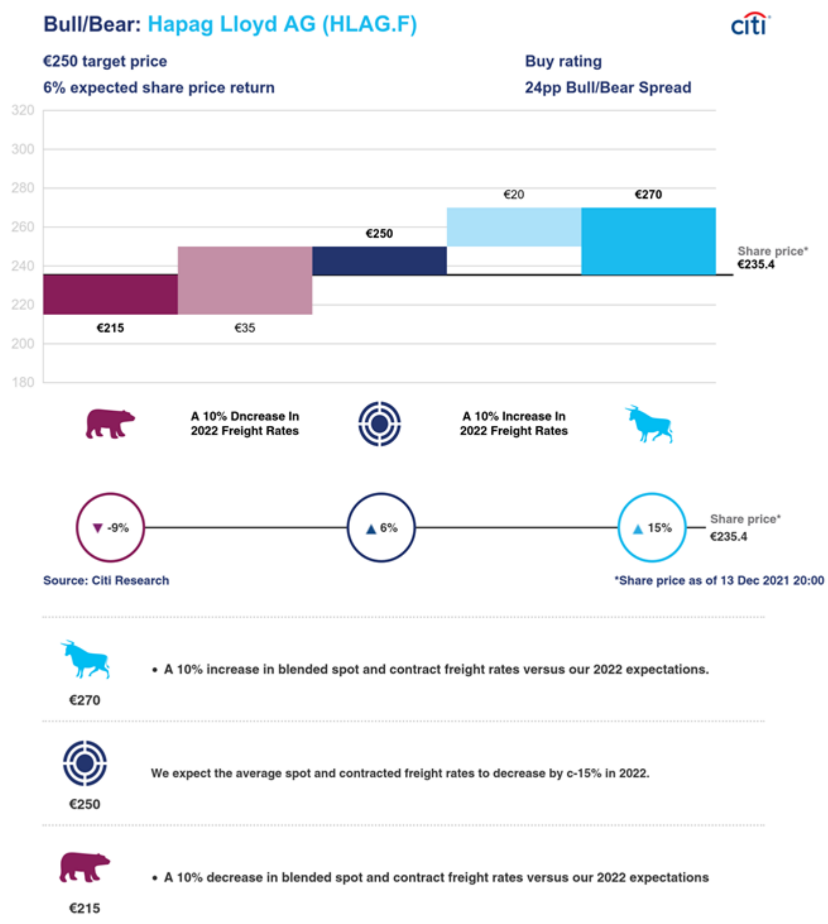

Source: Citi Research

Figure 33. Bull/Bear: Deutsche Post (DPWGn.DE)



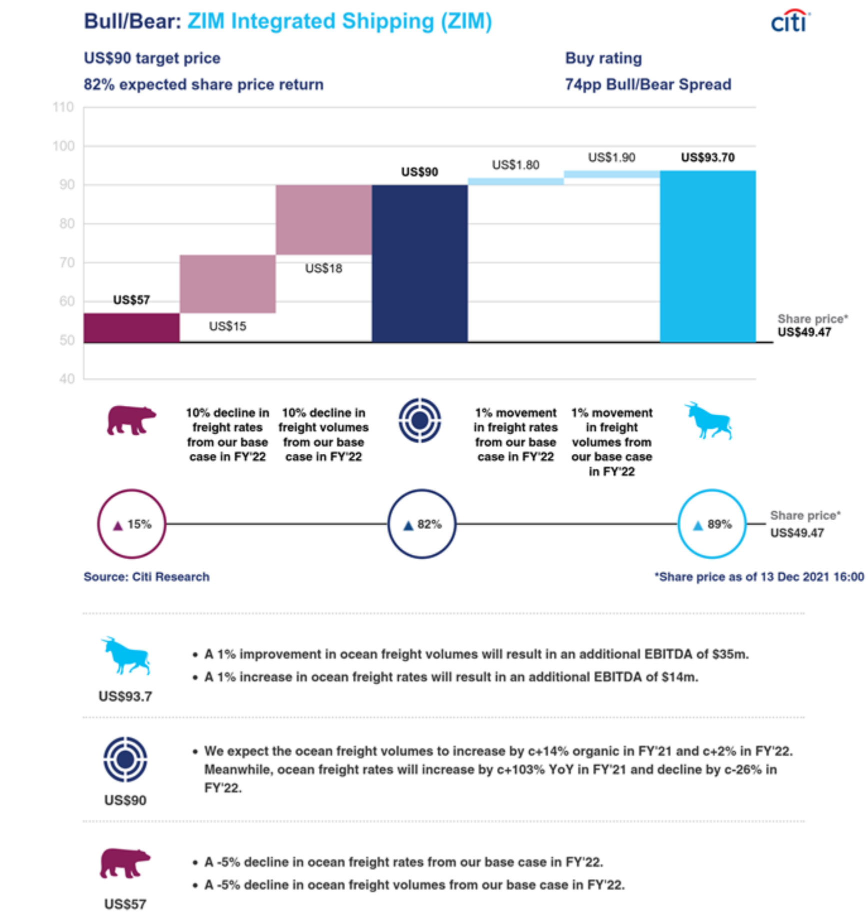

Source: Citi Research

**Figure 34. Bull/Bear: Hapag Lloyd AG (HLAG.F)**




Source: Citi Research

Figure 35. Bull/Bear: ZIM Integrated Shipping (ZIM.N)




Source: Citi Research

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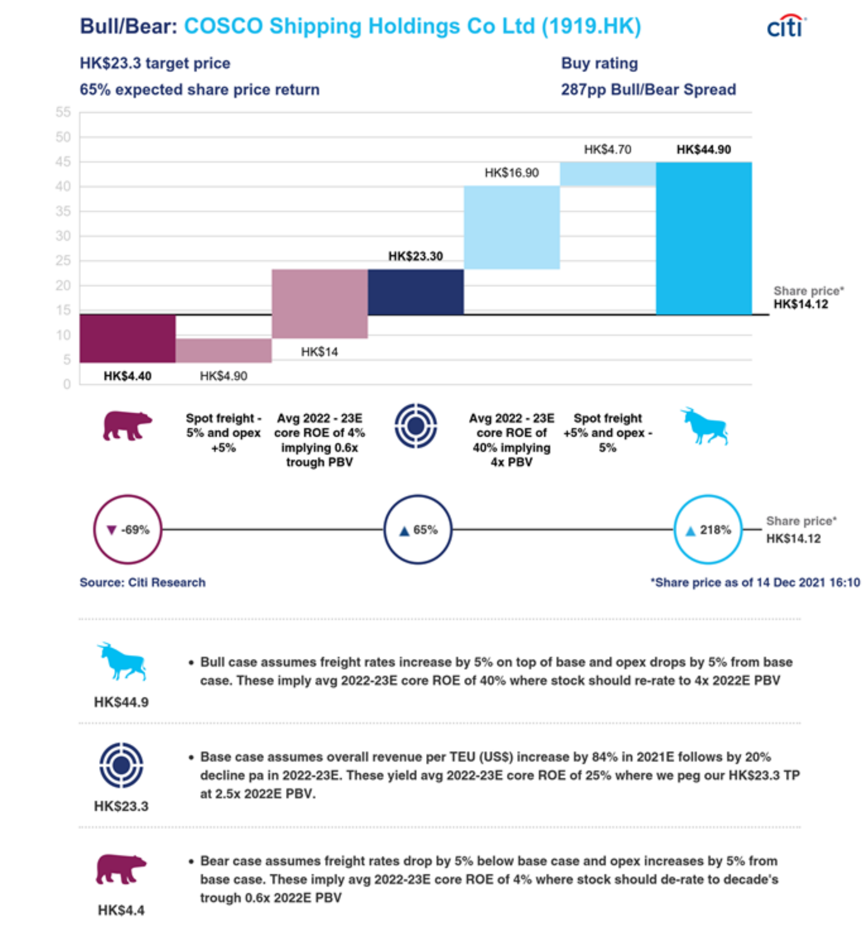
## In Asia Focus on Liners and Ports

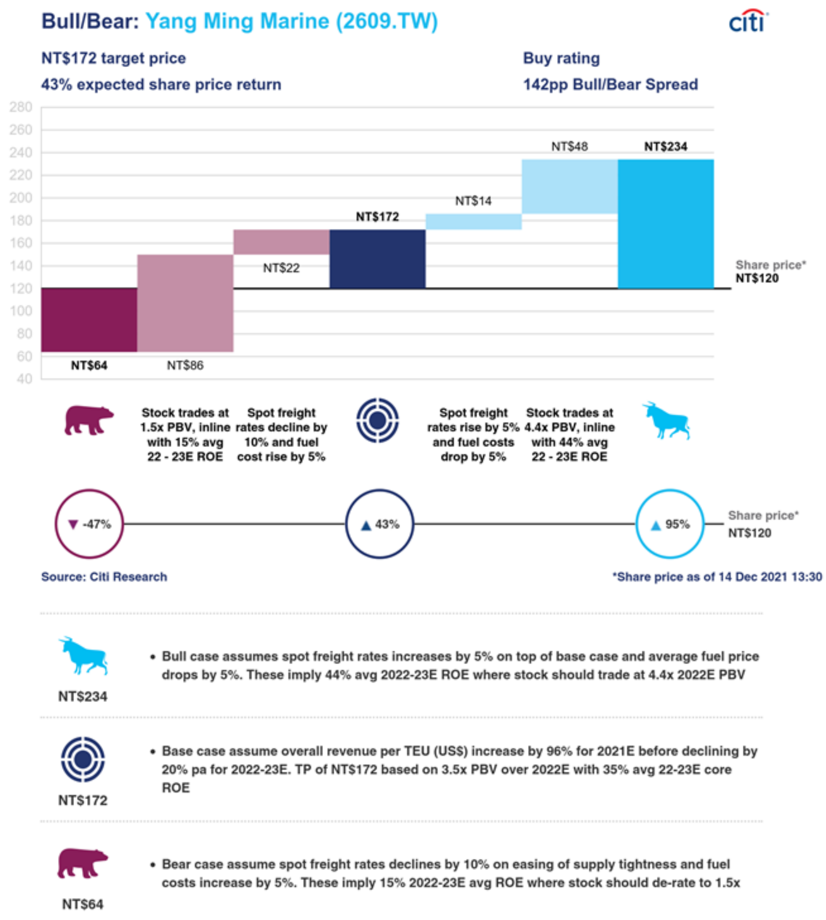
COSCO Shipping Holding (1919 HK, Buy, HK$ 23.3 TP) and Yang Ming Marine (2609 TT, Buy, NT$172) are our APAC container picks given the two are key beneficiaries of elevated freight rates, valuations look undemanding relative to prospective returns and they have swiftly growing net cash position against conservative capex commitments.

**Figure 36. Bull/Bear: COSCO Shipping Holdings Co Ltd (1919.HK)**




Source: Citi Research

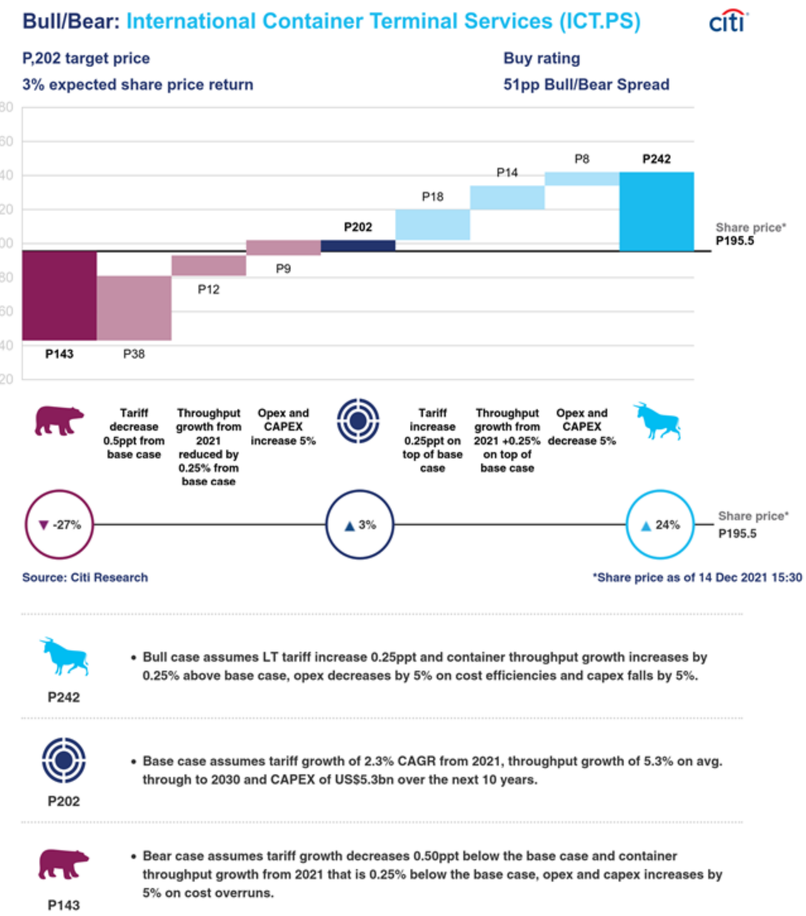
**Figure 37. Bull/Bear: Yang Ming Marine (2609.TW)**




Source: Citi Research

We see Intl Container Services Terminal (ICT PM, Buy, PHP202 TP) as a key beneficiary of strong container freight rates translating to ports' pricing power and throughput growth that's barely affected by congestions given gateway-centric mix. Its relatively low utilization base provides operating leverage slingshot into industry's up-cycle.

Figure 38. Bull/Bear: International Container Terminal Services (ICT.PS)




Source: Citi Research

Westports (WPRTS MK, Buy, RM 5.03 TP) is the concessionaire of Port Klang, the second largest port in Strait of Malacca serving one of the world's busiest trade lane Asia – Europe. Its cargo mix is c65% Transshipment which involves WPRTS moving container boxes from one vessel to another. With global liners' on-time performance near all time's low given supply chain congestions – boxes are stuck on WPRTS' yard where utilization is pushed to 100%. This has reduce effective throughput flows where pricing power is just enough to neutralize revenue whilst gateway centric ports such as ICT PM has been able to fully benefit from higher throughput and pricing.

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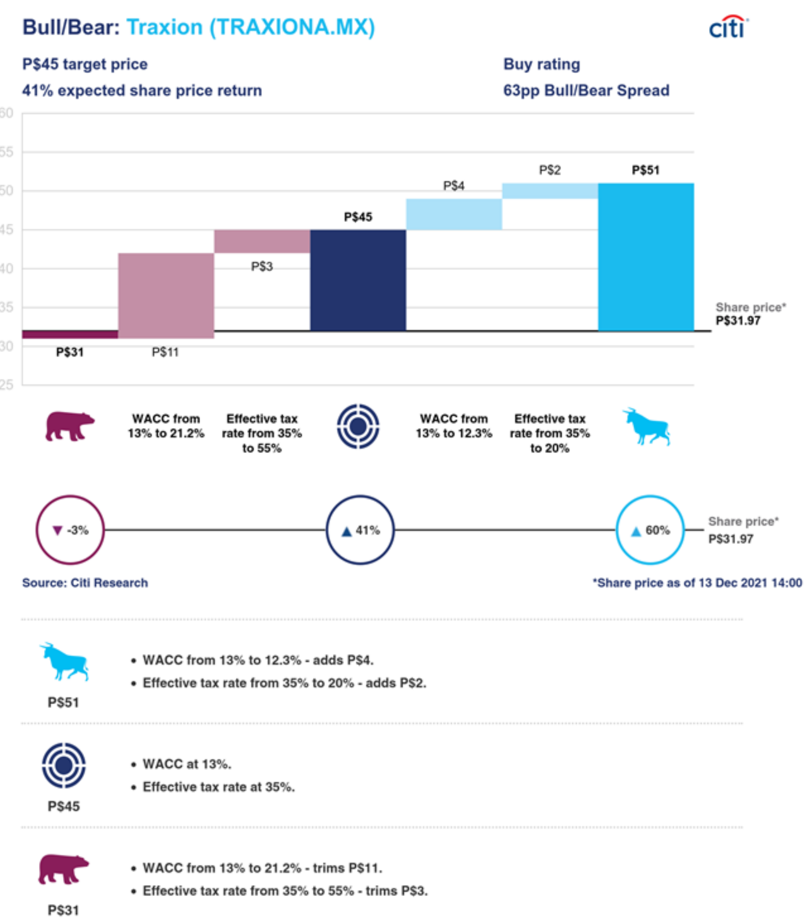
## In LatAm Focus on Trucking

In the wake of global supply chain challenges, Mexican trucking, e-commerce and personnel transport operator Traxion (TRAXIONA.MX, Buy, TP P$45/share) looks well positioned to see some increased flow, as some cargo potentially gets diverted. Although it is unclear how quickly the port of Los Angeles can de-bottleneck, it is conceivable that some of this flow gets diverted to Mexican ports. Traxion could see upside from its solid domestic volumes and its cross-border cargo capabilities.

In addition to having a good anchor in general cargo, Traxion also operates a refrigerated cargo division – a potentially vital service offering for products with potentially short shelf life. The company has an average fleet of 8,500 power units with an average age of four years.

**Figure 39. Bull/Bear: Traxion (TRAXIONA.MX)**




Source: Citi Research

**Related Research:**

[Westports Holdings (WPHB.KL): SepQ-21 core earnings down 10% YoY, congestion's pull outweighed push]

[International Container Terminal Services (ICT.PS): SepQ-21 strong results, gateway ploughs through supply chain congestion]

[Global Shipping: What's New at China Conference: Key Thoughts and Implications from Company Meetings]

# Real Estate

**Aaron Guy**
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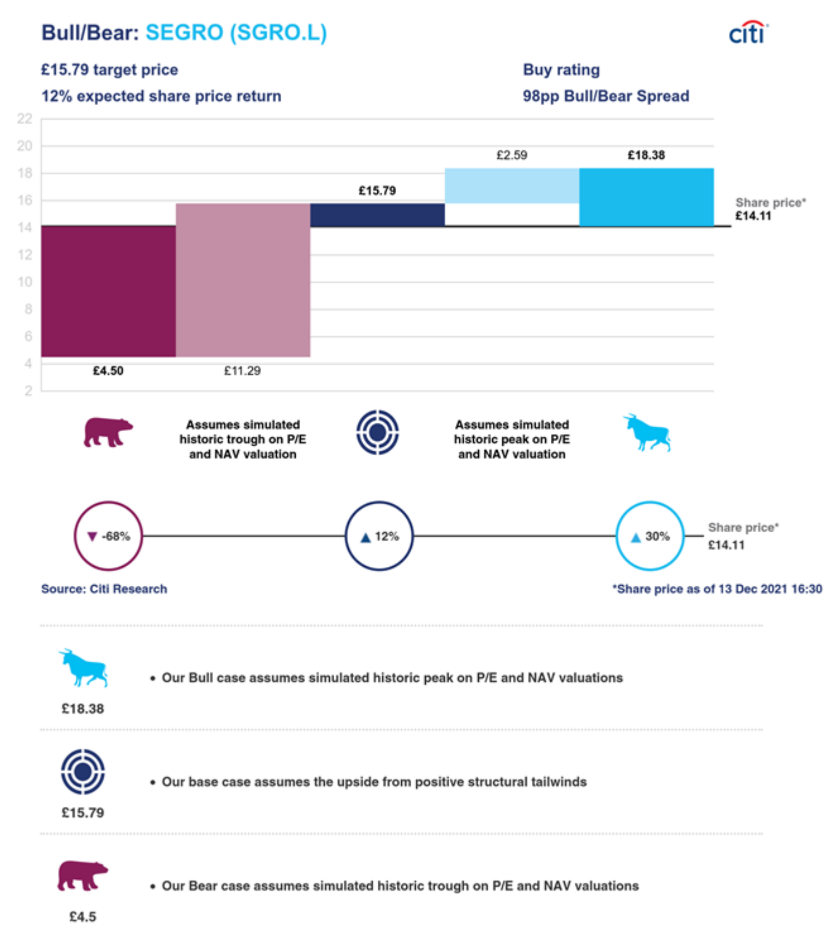
## European Real Estate

SEGRO (SGRO) – SEGRO's assets and customers are a meaningful part of the European supply chain. SEGRO own, manage and develop warehousing and light industrial properties with 8.8m square metres of built space and a development pipeline of a further 4.8m square metres. The portfolio is 37% Greater London, 16% Thames Valley, 10% UK National Logistics, 11% France, 10% Germany, 4% Poland and 12% across the rest of Europe including for example Italy, Netherlands, Spain and Czech Republic. Their portfolio serves 22% transport & logistics, 18% retail, 10% post and parcel delivery, 17% food and general manufacturing, 10% wholesale distribution, 9% technology, media and telecoms, 7% services and utilities and 7% other including data centres. While there are many drivers of space in SEGRO's portfolio ecommerce is the largest marginal demand driver and we estimate this is set to continue for many years. This is currently driving accelerated build out of new space, a factor that could see SEGRO's EPS double with like for like growth in the existing portfolio an additional driver, also currently experienced record levels of growth. We rate the company a Buy SEGRO (SGRO.L): Citi East London site visit – Even stronger than we thought , SEGRO (SGRO.L): Roaring Ahead Exposure to supply chain demand far outpacing supply has been our highest conviction Buy for some time, and we do not see these themes abating in the investible future. SEGRO (SGRO.L): Our highest conviction real estate sector

**Figure 40. Bull/Bear: SEGRO (SGRO.L)**




Source: Citi Research

**Michael Bilerman**
Global Head of Real Estate Research
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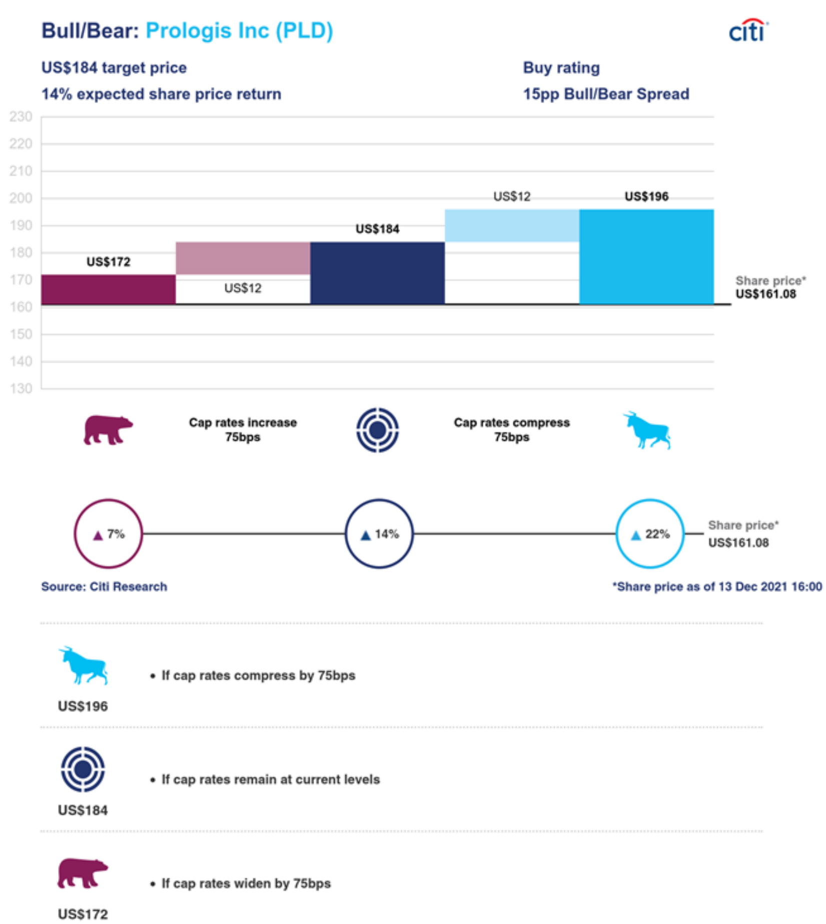
## US Real Estate

**POSITIVE:**

**Prologis (PLD)** – Prologis owns and develops logistics real estate totaling 994 million square feet across 19 countries. The company leases to approximately 5,500 customers principally in the business-to-business and retail/online fulfillment categories and approximately 2.5% of the world's GDP flows through the company's buildings annually. Customer demand for logistics real estate space remains high driven by supply chain transformation, continued growth in e-commerce (which needs ~3x more warehouse space than traditional retail), and moves for more onshoring and higher inventory levels partially driven by recent supply chain disruptions. Rental rate growth in the space should continue to be high as customers fight for limited space. Additionally, PLD's Essentials business provides turnkey warehouse solutions as well as cost savings for tenants. See more on our published research HERE.

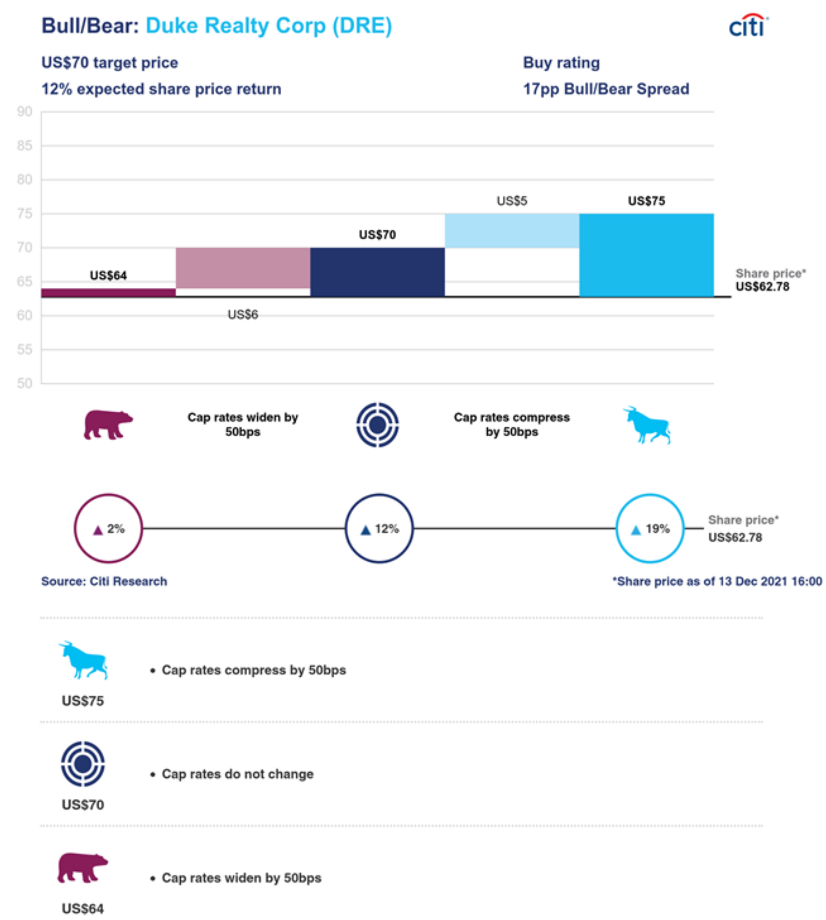
**Figure 41. Bull/Bear: Prologis Inc (PLD.N)**




Source: Citi Research

**Duke Realty (DRE)** – Duke Realty is an owner, manager, and developer of logistics real estate across the US totaling 160 million square feet. The company is focused on larger average asset sizes which cater to e-commerce and other distribution customers across the US. Customer demand for logistics real estate space remains high driven by supply chain transformation, continued growth in e-commerce (which needs ~3x more warehouse space than traditional retail), and moves for more onshoring and higher inventory levels partially driven by recent supply chain disruptions. Rental rate growth in the space should continue to be high as customers fight for limited space. See more on our published research HERE.

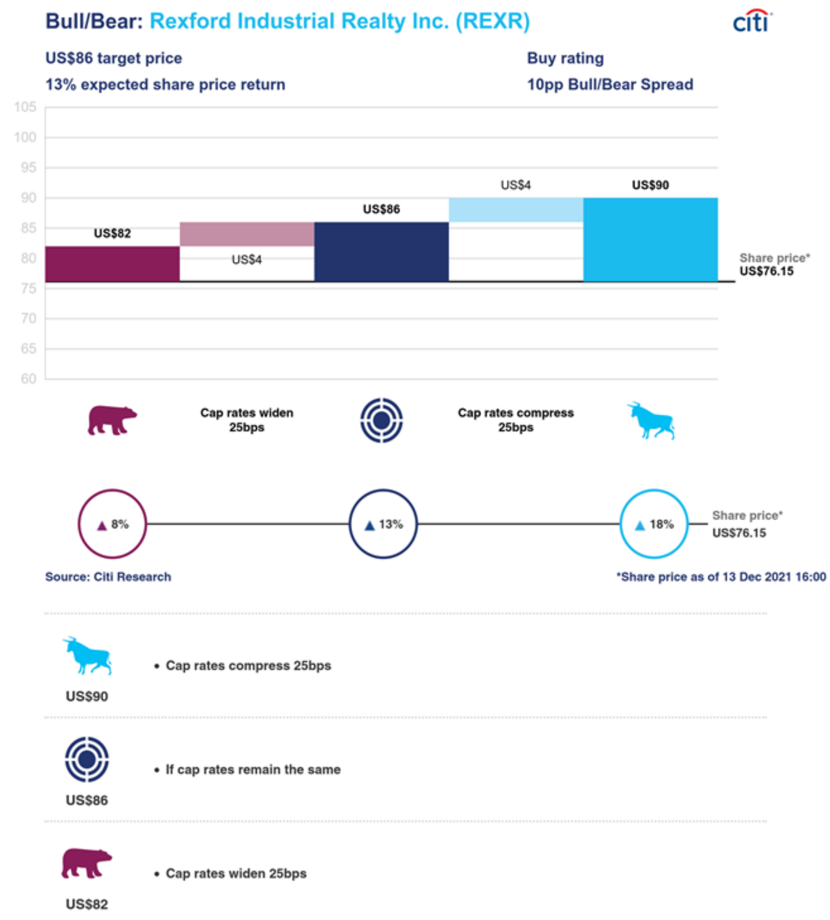
**Figure 42. Bull/Bear: Duke Realty Corp (DRE.N)**




Source: Citi Research

**Rexford Industrial Realty (REXR)** – Rexford is the owner of logistics real estate in Southern California totaling 32 million square feet with ~1,400 customers. The company is uniquely focused solely on the Southern California industrial market which is the largest in the US and 4th largest globally. Exposure to this large, diversified, and supply constrained market has allowed REXR to capture rental rate growth above peers and should continue. The company is seeing many of the same drivers of demand as peers (supply chain transformation, continued growth in e-commerce, and higher inventory levels) but also benefits from increased parking demand from port congestion as well as continued focus on last-mile distribution. The company has grown through acquisitions from private owners and redevelopment and this should continue. See more on our published research HERE.

Figure 43. Bull/Bear: Rexford Industrial Realty Inc. (REXR.N)




Source: Citi Research

**NEGATIVE:**

**Americold (COLD) –** Americold is the owner and operator of temperature controlled warehouse totaling 1.4bn cubic feet across 246 warehouses in North and South America, Europe, and Asia-Pac. Recent supply chain disruptions have negatively impacted COLD's business with labor the primary culprit. COLD's customers have struggled with labor which has decreased production and therefore decreased the level of inventory being stored within COLD's warehouses; labor shortages have also driven wages up for COLD and its customers. It is not clear when labor shortages and cost pressures will abate (or if/when COLD will be able to pass these increased costs along to their customers) but management remains optimistic for recovery into 2H22. Recent CEO termination and guidance misses have eroded investor confidence and most are taking a wait and see approach (see our notes HERE, HERE, HERE).

**Suraj Nebhani**
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# Australia & New Zealand Property

**Goodman (GMG.AX) – benefitting from the supply chain issues**

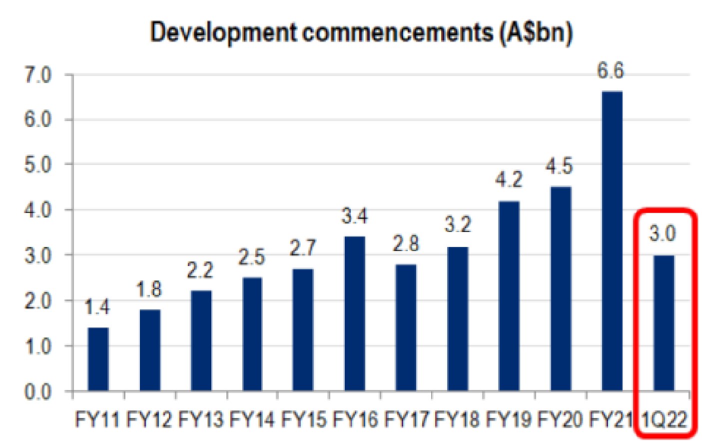
Goodman is among the world's largest owners, operators and developers of logistics real estate, and manages a >$60bn portfolio of logistics assets spread all across the world (Aus/NZ, Europe, China/HK, Japan, and parts of the US). These logistics assets primarily include warehouses which are leased to a range of corporates. GMG earns income from the rent generated from its assets, as well as from day-to-day management of these assets on behalf of their investor clients (management income) with management fees linked to asset values (which are rising given the favourable investment demand thematic for logistics assets). GMG earns development income as well by developing these assets for its investor clients, and the development margins are currently at record highs, and likely to stay there in the near term.

If the supply chain disruption continues, demand from its customers for warehouses is likely to only increase, (as they move from just-in-time inventory management to just-in-case, similar to what is happening in the US). This should drive strong demand for the logistics assets. Also, given the supply chain issues, there is a potential for near-shoring over the longer term which again is an incremental driver for demand for logistics space. This demand is from a broad range of existing and new customers. Their largest customers being the large e-commerce operators (Amazon, JD.com), freight and transport companies ( Deutsche Post/DHL, AP Moller – Maersk, Mainfreight), postal services (Japan post, Australia Post) and other retailer/industrial companies.

They have recently had a record number of development starts in FY21 and 1Q22 (indicating strong customer demand for these logistics assets, largely as a result of supply chain issues and increased e-commerce penetration post-Covid).

**Figure 44. Figure 4 from Goodman Group (GMG.AX): FY22 guidance upgraded, but remains conservative. Buy.**

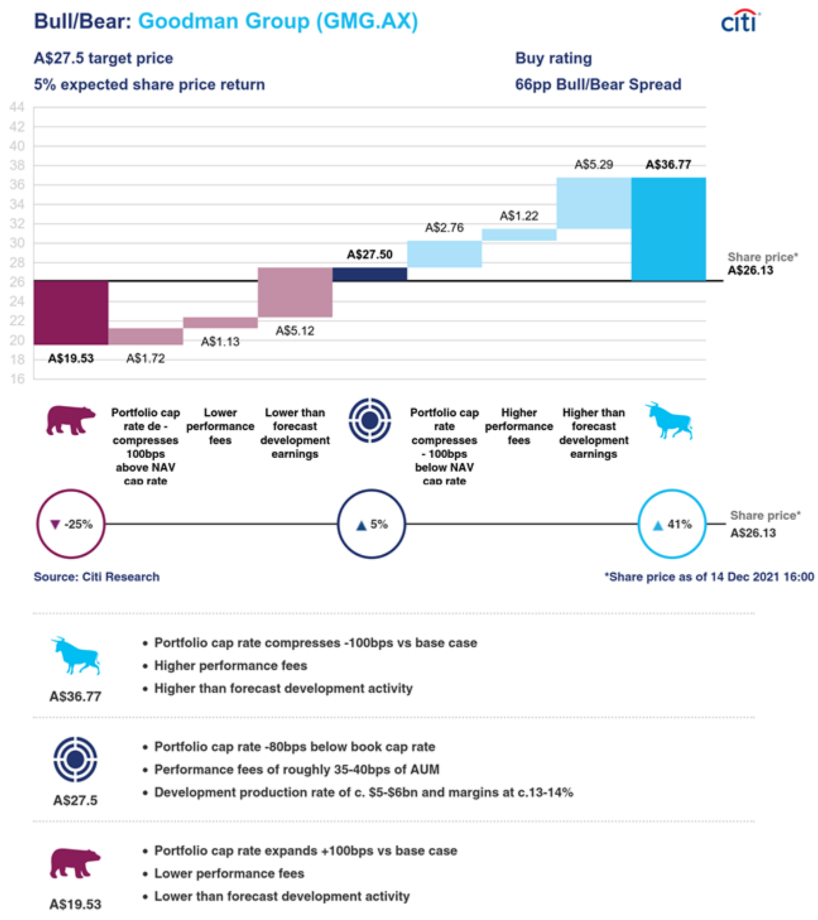
Figure 4. ...given the strong development commencements in 1Q22




Source: Citi Research, Company Reports

Source: Citi Research

Figure 45. Bull/Bear: Goodman Group (GMG.AX)




Source: Citi Research

**Related Research:**

[Goodman Group (GMG.AX): FY22 guidance upgraded, but remains conservative. Buy.]

[Goodman Group (GMG.AX): FY21 Results: In it for the long haul]

[Goodman Group (GMG.AX): Premium pricing reflects the strong growth outlook.]

**Masashi Miki**
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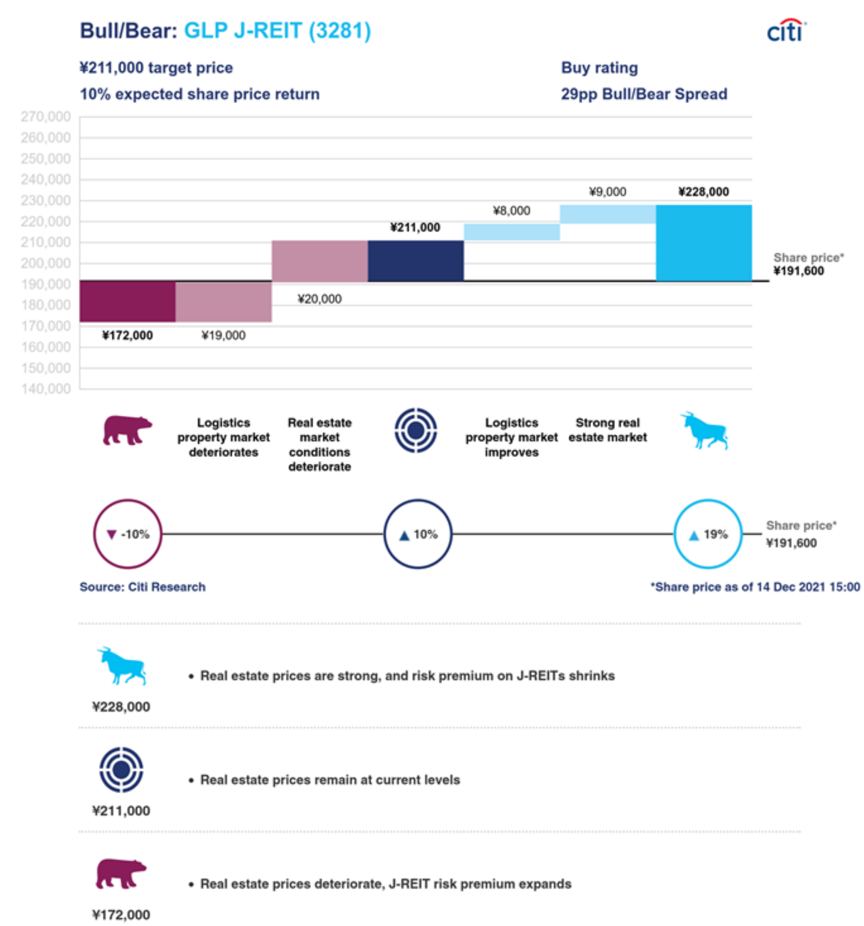
## Japan Real Estate

GLP J-REIT specializes in logistics facilities and has one of the largest asset portfolios in the country. With demand for logistics facilities continuing to rise in Japan, GLP-REIT invests in and manages unique and cutting-edge properties. GLP Group, the REIT’s sponsor, develops and manages logistics facilities in Japan and around the world, and it was one of the early players in Japan’s logistics property market. The sponsor pipeline is about ¥1trn, and in Japan its pace of development is more than ¥200bn, giving GLP J-REIT a pipeline advantage relative to peers.

We think GLP J-REIT is able to skillfully meet needs for diversified logistics facilities in terms of both 'hardware' and 'software'. The REIT's ALFALINK series of properties (a bigger project than previous facilities) provide not only storage and distribution services, but also boast upstream logistics functions like product planning, production, and processing, giving the REIT an edge over peers amidst moves toward supply chain integration. We think GLP J-REIT can leverage its 'software' advantages via GLP group companies like Monoful, which provides logistics solutions, and we look for its asset value to increase.

**Figure 46. Bull/Bear: GLP J-REIT (3281.T)**




Source: Citi Research



**Related Research:**

GLP J-REIT (3281.T): Resuming coverage at Buy

# Technology & Communications

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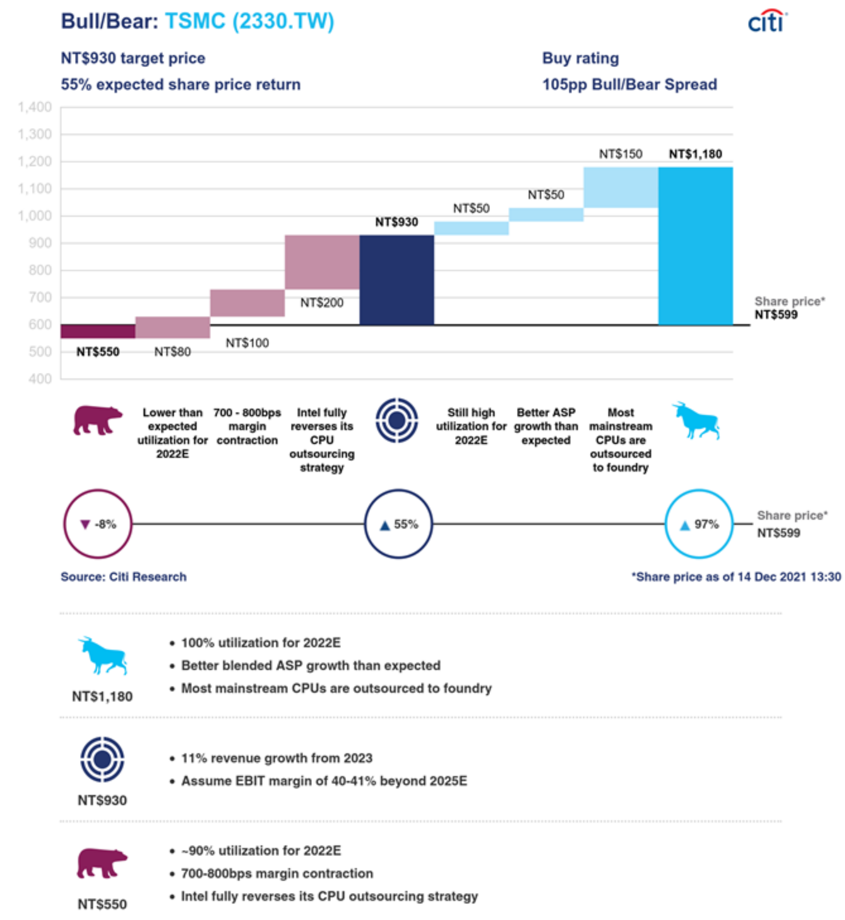
## Taiwan Technology

TSMC is worldwide foundry market share leader (~55%) with a giant technology leadership over the peers. It develops most leading edge technologies and builds capacities according to customers' demands. Most of time, TSMC fully loads all of the most leading edge capacities it built for customers. The fast asset turns with a price premium helps to justify the rapidly increase capital intensity to build the most leading edge technologies. Besides most leading edge nodes, mainstream and legacy nodes foundry capacities are extremely full due to industry-wide under investment and a buoyant demand from megatrend from AI, 5G, EV, HPC and IoT. The chip shortage from the semiconductor manufacturing capacity tightness not only impact the end demands such as auto, PC/NB, Apple's smartphone…etc. but also prolonged the lead-time of semiconductor precision equipment ( SPE). The prolonged SPE lead-time makes it difficult for semiconductor manufacturers to further expand capacity to ease the tightness in the near term. Most of the semiconductor companies who have reported 3Q21 results indicated the supply chain tightness would continue throughout 2022. TSMC will be able to load its capacities at very high utilization. The pricing environment will be also favorable to TSMC because of tight supply. TSMC will keep advancing revenue and earnings amidst the tight foundry capacity supply in 2022.

**Related Research:**

TSMC (2330.TW) - Expect Semiconductor Upcycle to Continue: Reiterate Buy

**Figure 47. Bull/Bear: TSMC (2330.TW)**




Source: Citi Research

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Downstream EMS, PC/server ODMs in the tech space could be vulnerable if supply chain disruption continues. The key gating items for the supply chain right now are small ICs including PIMIC, audio codec, Wi-Fi, and I/O controller ICs. As these ICs are manufactured at 8" fab, where the capacity is tight with limited additions over the past few years, the general expectation is for the supply tightness to continue into 2H22E until new capacity gradually comes on-line. In that case, the revenue/shipment of the EMS/ODMs for products including PC/NB, tablets, servers, and other consumer electronics could be capped by supply; margins could also be negatively impacted given that the unstable component supply could lead to sub-optimal manufacturing efficiency. In light of the supply chain challenges, many have started working on product re-design, qualifying alternative sources, or negotiate longer-term capacity commitments in order to mitigate the supply tightness. Apart from that, Hon Hai, who has better vertical integration, will leverage its own 6"/8" fab for silicon-based IC production to increase supply. Even so, we believe component supply would still remain as a key swing factor for downstream EMS/ODMs in 2022E. Stocks that could be impacted by supply chain challenges include Hon Hai (2317.TW), Quanta (2382.tw), Compal (2324.TW), Inventec (2356. TW), Pegatron (4938.TW), Wistron (3231. TW), Wiwynn (6669.TW), and Accton (2345. TW).

**Peter Lee**
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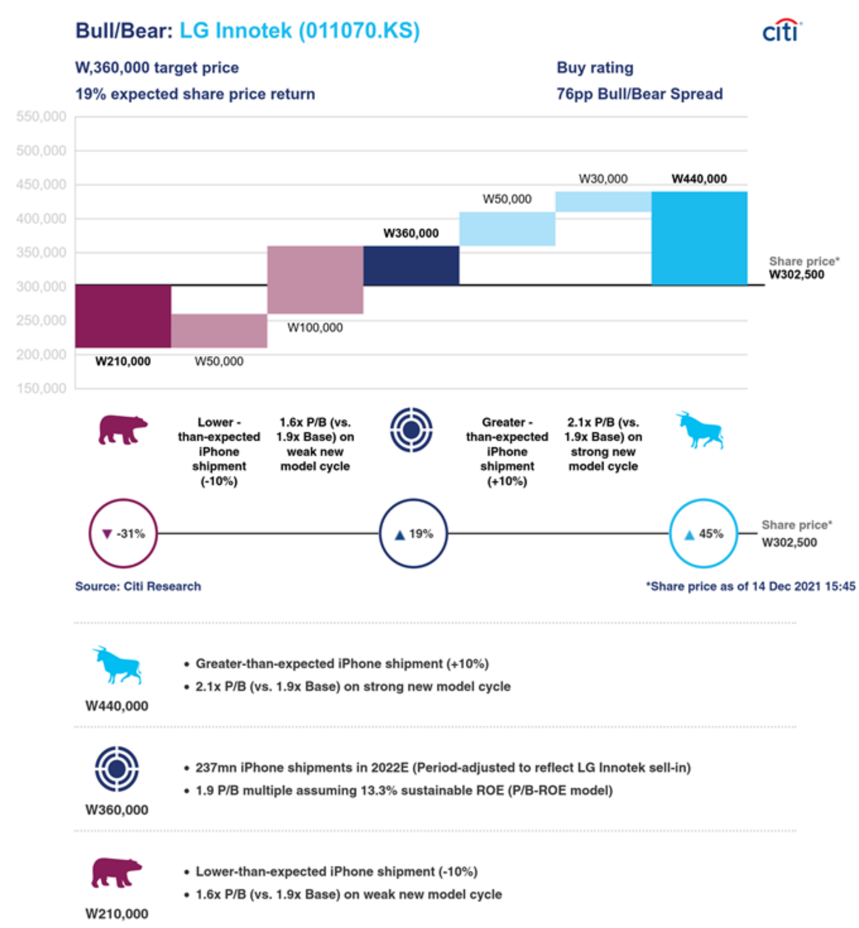
## Korea Technology

We expect LG Innotek to positively benefit from continued Supply Chain disruption and challenges, given LG Innotek's strong position in Camera module business for Smartphone and Automotive. We believe LG Innotek possesses superior Sensor-shift technology vs. its peers, and expect its advanced technology to provide a substantial tailwind going forward, along with company's world-class supply chain management. We also believe smartphone makers' launch of XR features to support metaverse-related applications in 2022E could provide demand upside for the company's TOF (Time of Flight).

**Figure 48. Bull/Bear: LG Innotek (011070.KS)**




Source: Citi Research

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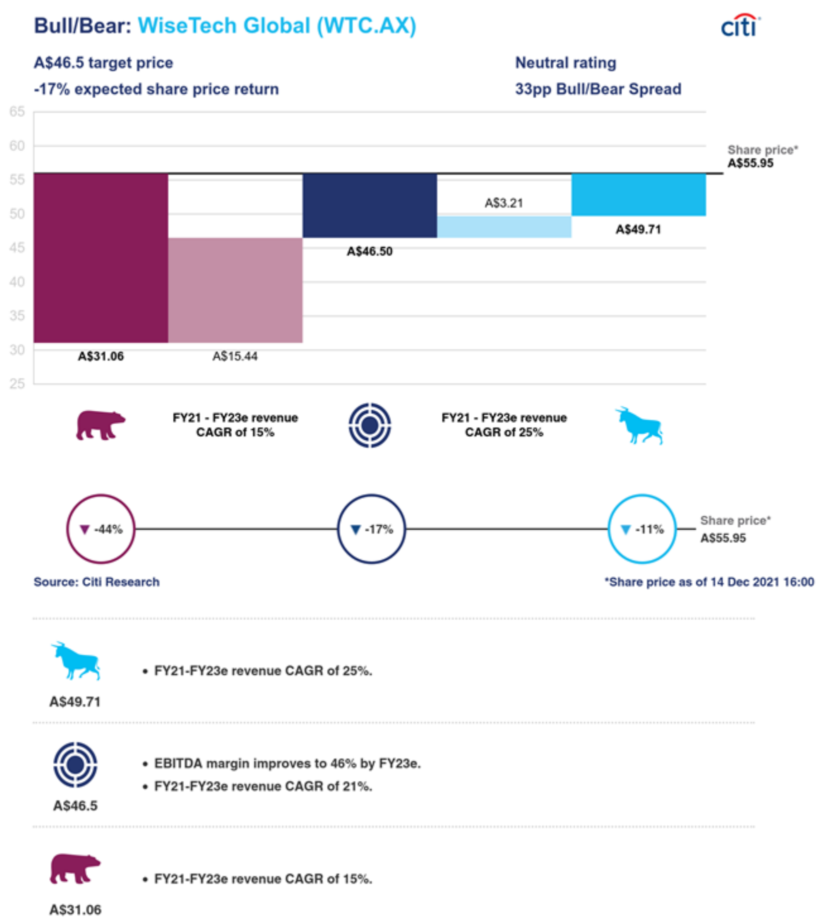
## Australia Technology

WiseTech is a leading software provider to the logistics execution industry, especially 3PLs, with more than 15,000 customers in more than 150 countries. Cargowise One, WiseTech's core product, is a market leading freight forwarding software solution that is used by many of the largest logistics providers in the world.

The recent supply chain disruptions has increased demand for end to end software solutions, especially in terms of visibility and reducing manual-based tasks, and has increased demand for WiseTech's software stack. Further, given many of the largest 3PLs have seen strong profitability in the past 12 – 18 months has also increased the propensity to spend on technology.

Figure 49. Bull/Bear: WiseTech Global (WTC.AX)




Source: Citi Research

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## Hong Kong Internet & Media

JD Logistics: Established in 2007 as the in-house logistics department of the JD Group, JDL is China's largest provider of integrated supply chain (ISC) logistics services, based on 2019 revenue, per CIC.

The company has solid infrastructure, especially in warehouse and last-mile delivery, and technologies including automation, digitalization and intelligent decision making capabilities.

JDL has strong industry knowhow in FMCG, large appliance and electronics, which can better help its customers to solve industry pinpoints and integrate their services into customers' operation.

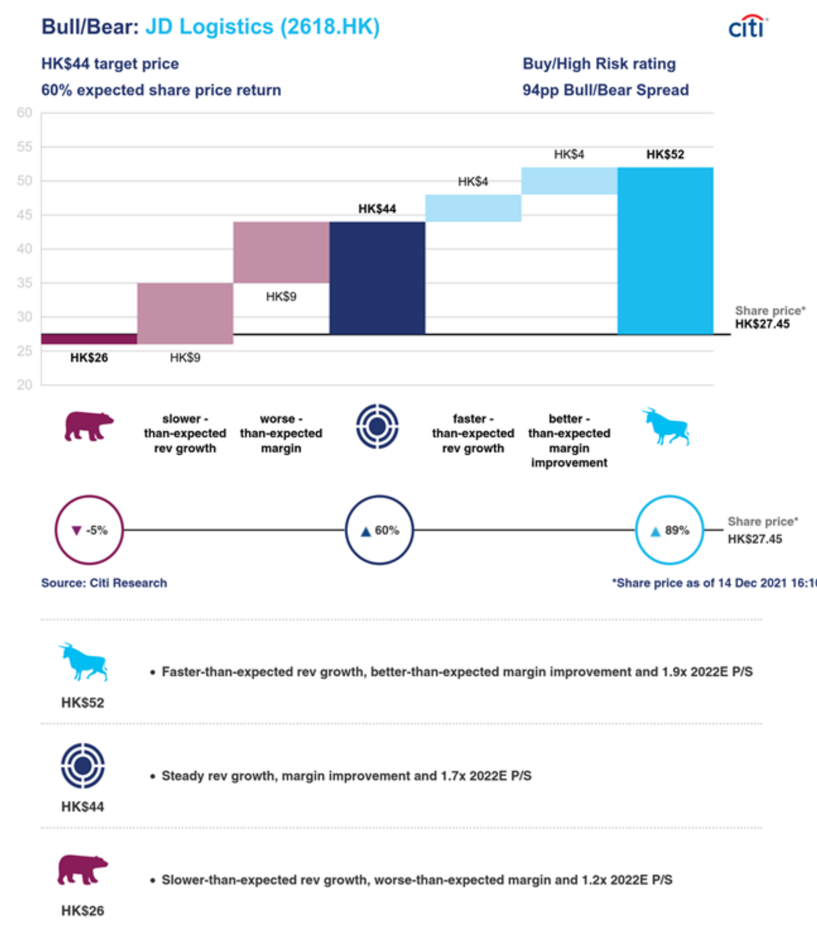
JDL is enjoying steady growth of JD Retail, who is the largest customer, but also expanding into external customers via 1) serving more top customers, 2) penetrating deeper into their pocket, and 3) penetrating into SMEs across different verticals with standardization and modularization of its services offerings.

With strong technologies, JDL should benefit from China government's favorable policies to encourage modernization and digitalization of logistics industry.

**Related Research:**

[JD Logistics (2618.HK): Initiate at Buy/H on Tech-Driven Integrated Supply Chain Leader]

Figure 50. Bull/Bear: JD Logistics (2618.HK)




Source: Citi Research

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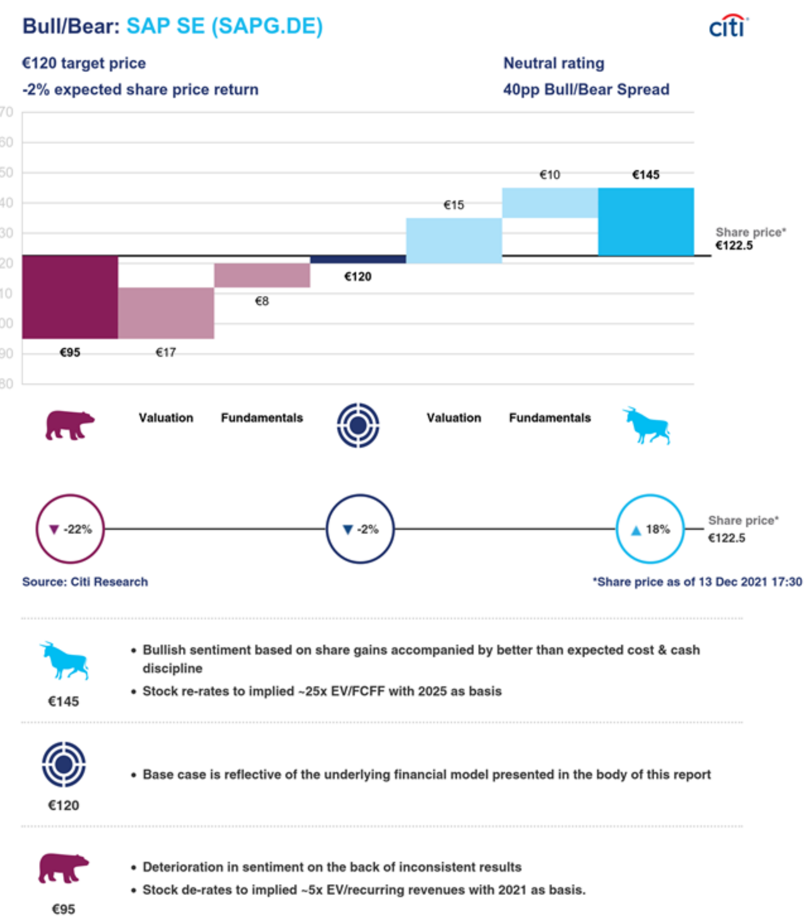
## European Technology

**SAP:** Enterprise software vendor SAP is the global market leader in Supply Chain Management (SCM) software. According to data from industry research firm Gartner, SAP's market share stood at 27.8% in 2020, almost 2.5x that of the #2 player in this space. In our view, the broader SCM software space (and SAP) should benefit from investments post pandemic in modernizing legacy supply chain processes that in turn should enable the adopters to improve agility and overcome unanticipated economic disruptions. Gartner forecasts that spending on SCM Software will double by 2025, compared to 2020, representing a CAGR of ~14%. Our Neutral rating on SAP is predicated upon a balanced risk-reward profile with elevated near-term uncertainty offsetting the long-term potential.

**Figure 51. Bull/Bear: SAP SE (SAPG.DE)**




Source: Citi Research

**Michael Rollins**
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## US Telecoms

Stocks under coverage that are vulnerable to further supply chain challenges:

**AT&T (T.US)**

- The market is focused on AT&T actively expanding its fiber footprint to reach 30 million locations by 2025 which could face construction and service launch delays and/or moderately higher costs
- The active buildout out of AT&T's 5G network could face construction delays and/or moderately higher costs
- Impacts to housing starts could negatively impact AT&T's ability to grow its subscriber base
- The supply of mobile devices and CPE for consumers and business customers could face shortages

**Verizon (VZ.US)**

- The active buildout out of Verizon's 5G network buildout and FiOS fiber footprint upgrades/expansions could face construction delays and/or moderately higher costs

- Verizon continues to build out its One Fiber network to expand its fiber infrastructure outside of its Northeast ILEC footprint, which could face construction delays and/or moderately higher costs
- Impacts to housing starts could negatively impact Verizon's ability to grow its subscriber base
- The supply of mobile devices and CPE for consumers and business customers could face shortages

**T-Mobile US (TMUS.US)**

- The active buildout out of T-Mobile's 5G network could face construction delays and/or moderately higher costs
- Integration activities with Sprint could face delays which in turn could have impacts on timing of synergy realization
- Impacts to housing starts could negatively impact T-Mobile's ability to grow its subscriber base
- The supply of mobile devices and CPE for consumers and business customers could face shortages

**Altice USA (ATUS.US)**

- Altice is undertaking a multi-year fiber upgrade and expansion investment cycle, which could face construction and service launch delays and/or moderately higher costs
- Altice's upgrade of its Suddenlink cable HFC network upgrade could face construction delays and/or moderately higher costs
- Impacts to housing starts could negatively impact Altice's ability to grow its subscriber base
- The supply of mobile devices and CPE for consumers and business customers could face shortages

**Charter (CHTR.US)**

- Charter is expanding its fiber footprint in targeted rural areas (e.g. RDOF) which could face construction and service launch delays and/or moderately higher costs
- Impacts to housing starts could negatively impact Charter's ability to grow its subscriber base
- The supply of mobile devices and CPE for consumers and business customers could face shortages

**Liberty Broadband (LBRDK.US)**

- By virtue of owning 26% of Charter, Liberty Broadband shares are impacted by Charter's supply chain risks
- GCI's active buildout of its 5G mobile network and fixed broadband infrastructure (e.g. Aleutians fiber project) could face construction delays and/or moderately higher costs
- Impacts to housing starts could negatively impact GCI's ability to grow its subscriber base

- The supply of mobile devices and CPE for consumers and business customers could face shortages

**Liberty Latin America (LILAK.BM)**

- Liberty Latin America is actively upgrading and expanding its fixed broadband footprint which could face construction delays and/or moderately higher costs
- Impacts to housing starts could negatively impact Liberty Latin America's ability to grow its subscriber base
- The supply of mobile devices and CPE for consumers and business customers could face shortages

**Lumen (LUMN.US)**

- Lumen is actively upgrading and expanding its fiber footprint which could face construction delays and/or moderately higher costs
- Impacts to housing starts could negatively impact Lumen's ability to grow its subscriber base
- The supply of mobile devices and CPE for consumers and business customers could face shortages

**Consolidated Communications (CNSL.US)**

- Consolidated is actively upgrading and expanding its fiber footprint which could face construction and service launch delays and/or moderately higher costs
- Impacts to housing starts could negatively impact Consolidated's ability to grow its subscriber base
- The supply of mobile devices and CPE for consumers and business customers could face shortages

**TDS (TDS.US)**

- TDS is actively upgrading and expanding its fiber footprint which could face construction and service launch delays and/or moderately higher costs
- Impacts to housing starts could negatively impact TDS's ability to grow its subscriber base
- The supply of CPE for consumers and business customers could face shortages

**USM (USM.US)**

- The active buildout out of USM's 5G network buildout could face construction delays and/or moderately higher costs
- Impacts to housing starts could negatively impact USM's ability to grow its subscriber base
- The supply of mobile devices and CPE for consumers and business customers could face shortages

**DISH Networks (DISH.US)**

- Dish is actively building out its facilities-based 5G network which could face construction and service launch delays and/or moderately higher costs

- Impacts to wholesale supplier network expansions (e.g. AT&T and T-Mobile) could impact Dish's ability to deliver MVNO services
- Impacts to housing starts could negatively impact Dish's ability to grow its subscriber base
- The supply of mobile devices and CPE for consumers and business customers could face shortages

**Echostar (SATS.US)**

- The launch of its Jupiter 3 high throughput capacity GEO-stationary satellite could be delayed which impacts Echostar's ability to deliver sufficient broadband capacity
- Impacts to housing starts could negatively impact Echostar's ability to grow its subscriber base
- The supply of CPE for consumers and business customers could face shortages

**IHS Holding Ltd (IHS.GB)**

- IHS has called out an impact, referencing higher equipment prices stemming from a constricted supply chain.
- Similar to other digital infrastructure firms, IHS is looking to mitigate the impact by accelerating equipment orders by one to three months

**Related Research:**

AT&T Inc (T.N) - Additional Takeaways from AT&T's 3Q21 Earnings

US Telecommunications Operators - Mixed 3Q Financials and Volumes for UScellular and TDS Telecom

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## US Technology

### EMS, 3D & Graphic Printing, & Distributors Benefit from Supply Chain Challenges

The EMS, 3D & Graphic Printing, & Distributors should positively benefit from continued supply chain disruption/challenges and centralized production and service become more risky and customers look for risk mitigation and geographic diversification.

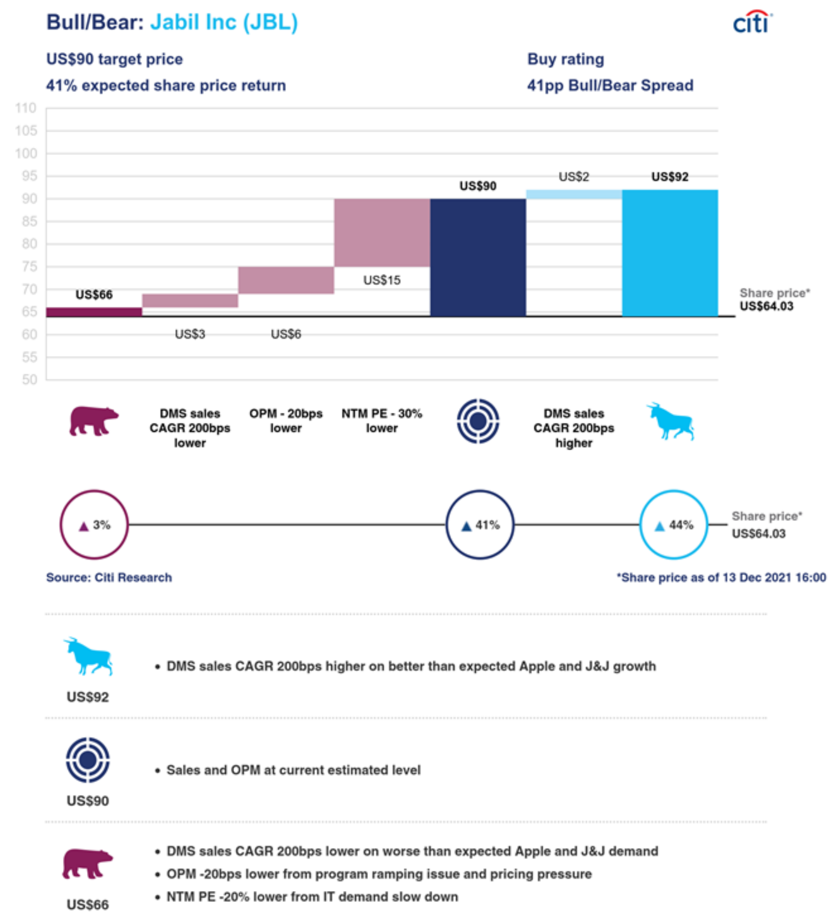
#### EMS Industry: Production to Shift to More Local Production

- **Lowest Cost No Longer The Best Option** – The Electronics Manufacturing Services (EMS) sector will benefit from the supply chain challenges as companies will no longer source production from the lowest cost region because logistical issues can result in missed sales opportunities. Many companies are proactively doing risk mitigation to shift production from concentrated China locations to more local production.
- Jabil (JBL: Buy; TP $90):

- **Company description** – Jabil is the 3rd largest EMS company and has a very global and diversified end product footprint.

- **Benefitting from Supply Chain Challenges** – Factories in higher cost locations will see higher utilization rates as companies move production more locally to mitigate supply chain challenges. This will result in higher operating margins for Jabil.

**Figure 52. Bull/Bear: Jabil Inc (JBL.N)**



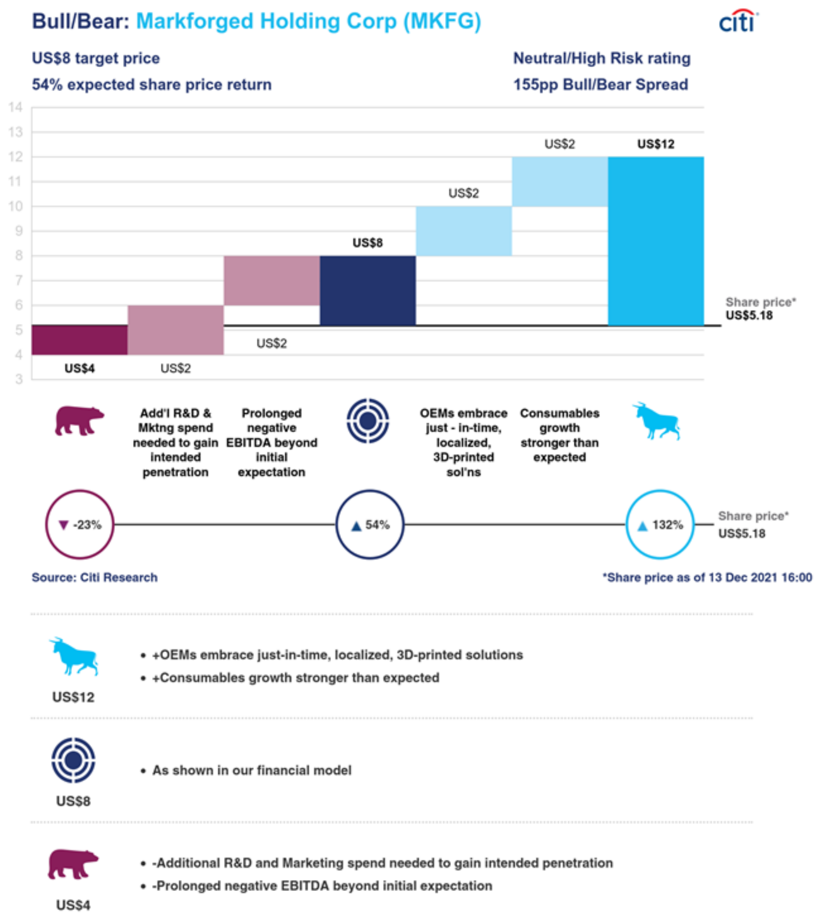

Source: Citi Research

**MKFG (Neutral/High Risk; TP $8):**

- **Company description** - Markforged designs, markets, and distributes additive cloud-connected metal and composite 3D printing machines. Markforged products are used in real life for repairs, replacement and full products.

- **Benefitting from Supply Chain Challenges** - Due to the connected-design of Markforged devices, they can be remotely printed to anywhere an appropriately-equipped machine is located. The 3D parts do not need to be built in low cost countries and shipped around the world. Markforged's value proposition resonates in an economy where businesses strive to save costs, minimize supply chain disruptions and the need to react to unforeseen events.

Figure 53. Bull/Bear: Markforged Holding Corp (MKFG.N)



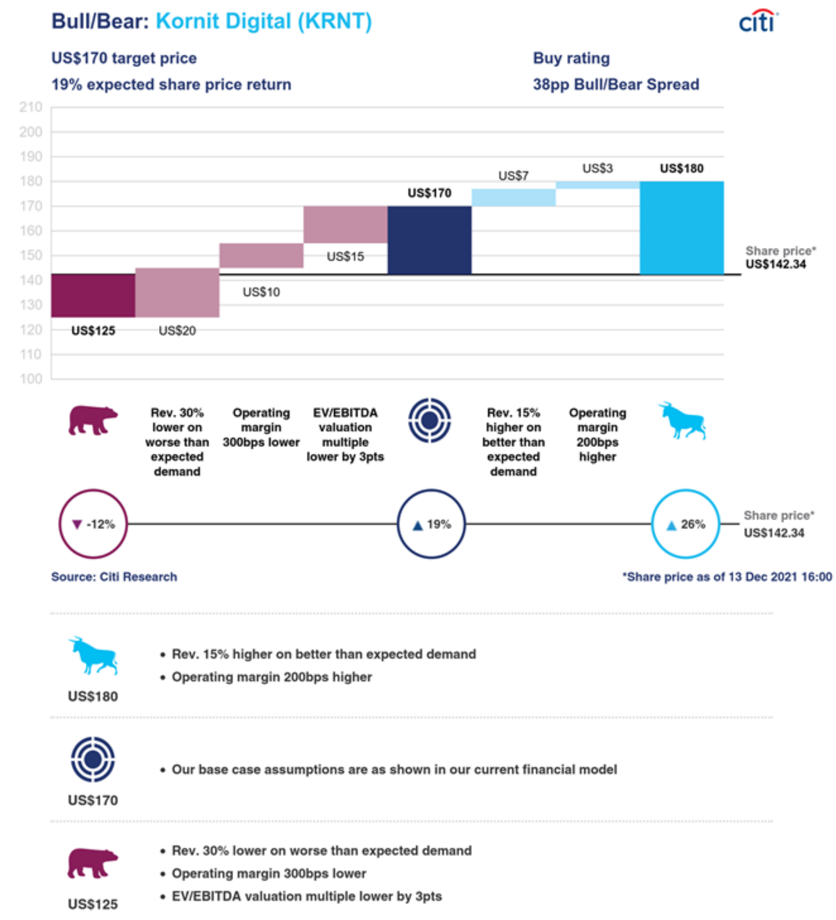

Source: Citi Research

**KRNT (Buy; TP $170):**

- **Company description** - Kornit Digital is a leading manufacturer of commercial direct-to-garment printers, inks and software for the garment, apparel and textile industries. Kornit's end-to-end solution is built on its proprietary NeoPigment ink process with integrated pretreatment; plus industry-leading print-on-polyester solution.

- **Benefitted from Supply Chain Challenges** - Kornit brings on-demand apparel, sportswear, and home goods solutions. It is well positioned to take advantage of the increasing demand for more unique custom printing and selection coupled with localized printing to reduce inventory, shipping costs and ship time.

Figure 54. Bull/Bear: Kornit Digital (KRNT.O)

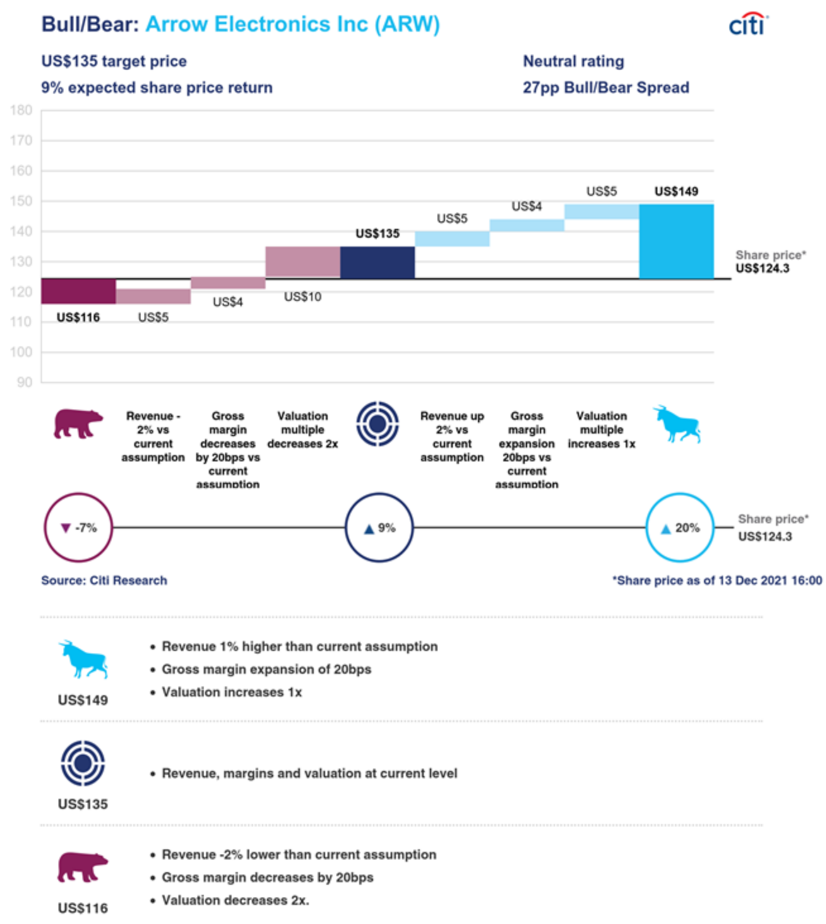



Source: Citi Research

**IT Distributors: ARW (Neutral; TP $130), AVT (Neutral; TP $39), CDW (Buy; TP $210), SNX (Buy; TP $155):**

- **Benefitted from Supply Chain Challenges** - Global distributors of electronics components and computer products could benefit from the ongoing supply chain disruptions because of the higher pricing and their value added solutions. Higher pricing and less discounting will help boost margins of these companies.
- Company Description
  - **ARW:** Arrow serves as a supply channel partner for more than 125,000 original equipment manufacturers, contract manufacturers and commercial customers through a global network of more than 465 locations in over 90 countries. No single customer representing more than 10% of sales. We expect inventors to consider potentially giving Arrow a higher valuation multiple should the company be able to continue this high profitability.

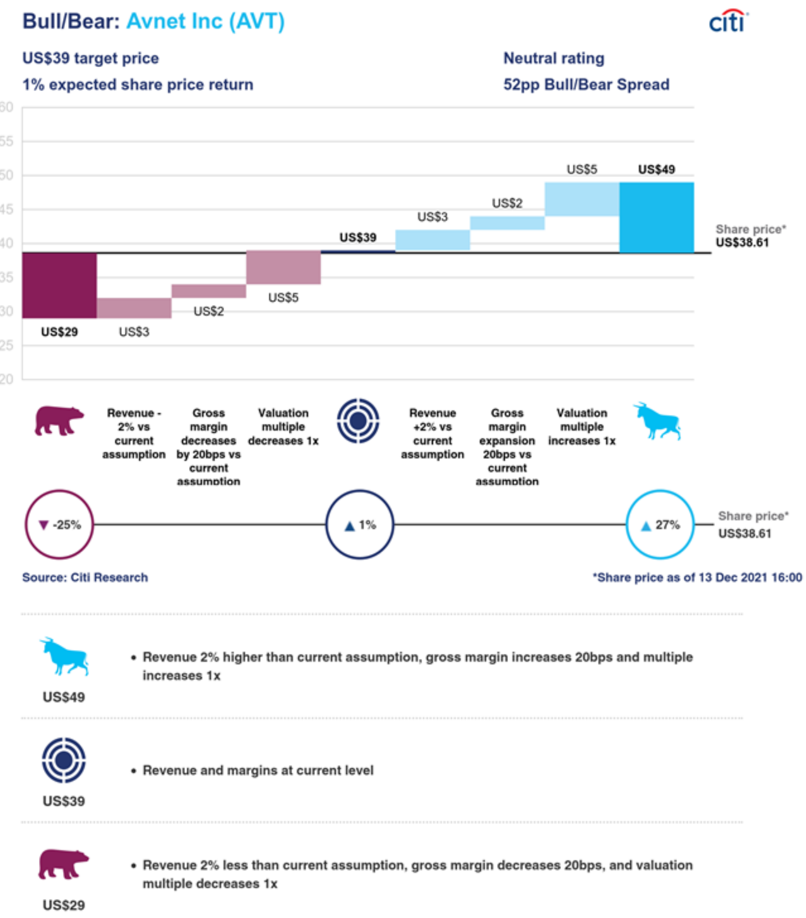
**Figure 55. Bull/Bear: Arrow Electronics Inc (ARW.N)**




Source: Citi Research

– **AVT:** Avnet is a leading global distributor of electronics components. Avnet has two primary operating groups — Electronic Components ("EC") and Premier Farnell ("PF"). Avnet is headquartered in Phoenix, AZ and has ~15,700 employees.

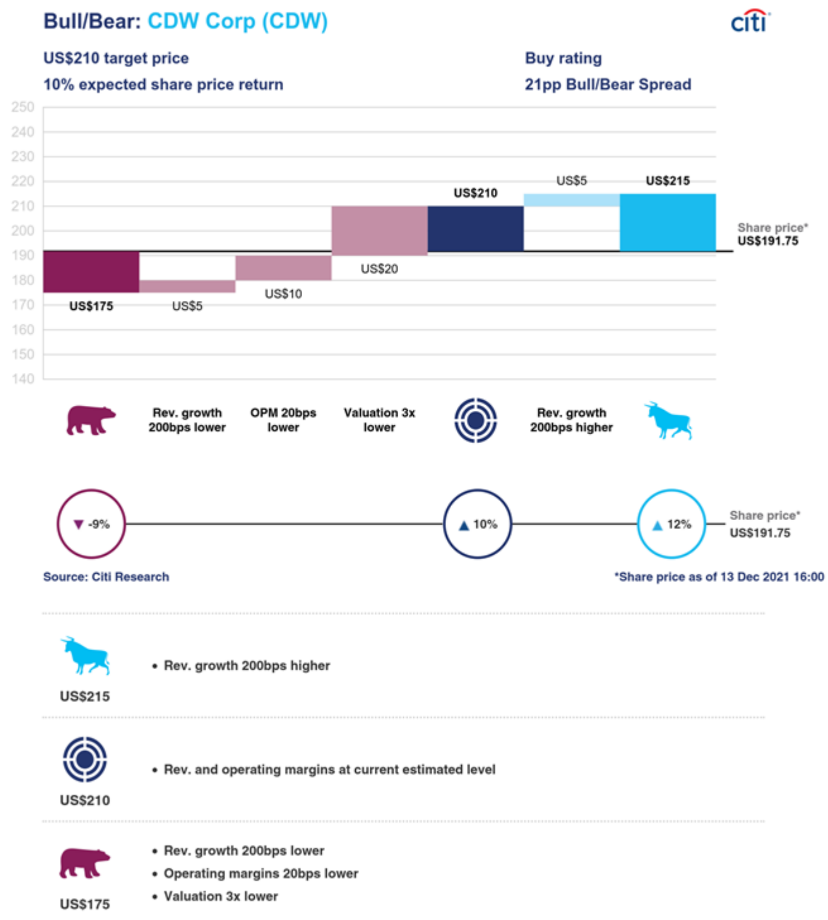
Figure 56. Bull/Bear: Avnet Inc (AVT.O)




Source: Citi Research

– **CDW:** Headquartered in Lincolnshire, Illinois, CDW is the largest value-added reseller in North America with ~5% market share. The company provide value-added IT solutions to 250,000 customers in corporate (>250 employees), small businesses (<250 employees) and public sectors (incl. healthcare, education, state and federal government). We see additional government stimulus for education and local government as additional upside.

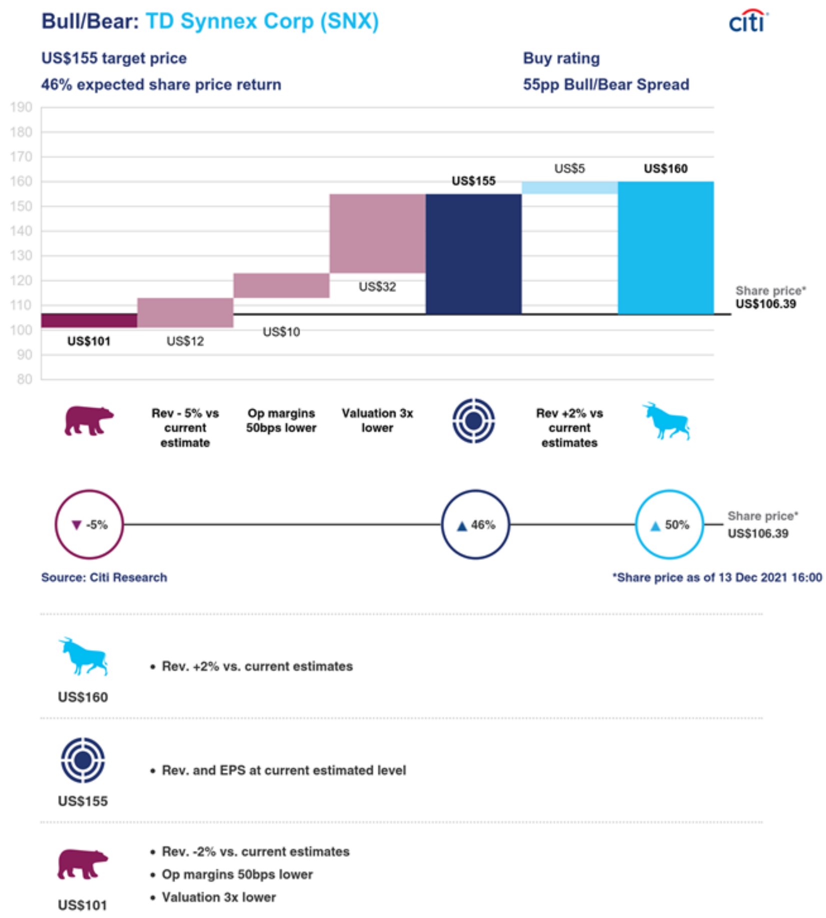
**Figure 57. Bull/Bear: CDW Corp (CDW.O)**




Source: Citi Research

– **SNX:** Synnex Corp distributes peripherals and IT as well as systems design and integration solutions. The company distributes more than 30,000 technology products (as measured by active SKUs) from more than 300 IT, CE and original equipment manufacturers or OEM suppliers to more than 20,000 resellers, system integrators, and retailers throughout the United States, Canada, and Japan. We are incrementally more positive on SNX given the company's increasing exposure in value add services.

Figure 58. Bull/Bear: TD Synnex Corp (SNX.N)




Source: Citi Research

**Tyler Radke**
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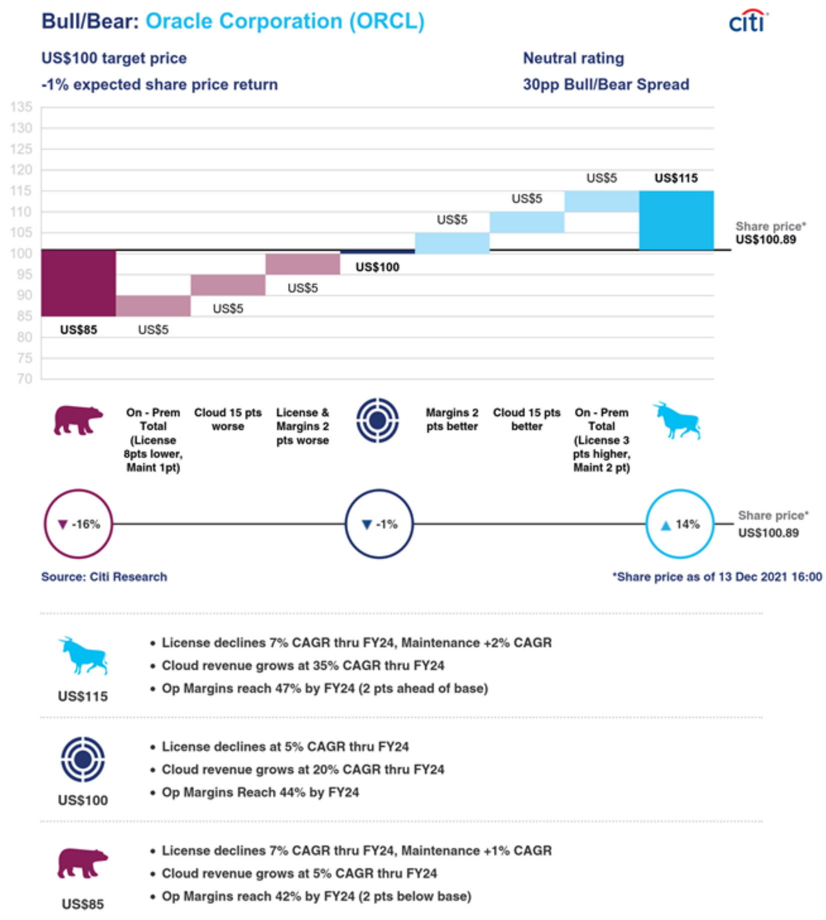
## US Software

Oracle has a line of back-office/supply chain applications called Fusion Cloud Supply Chain Management and Manufacturing management. This product suite helps companies engage in supply chain planning, inventory management, logistics, product lifecycle management and newer offerings in Blockchain/Iot. The ongoing supply chain challenges have provided an opportunity for software companies to help organizations gain better visibility and identify chokepoints. While Oracle does not break out their supply chain revenue explicitly (as it is a very small % of overall), we would highlight that their broader “ERP cloud” offering has been strong with growth above 30% y/y. We do note the software SCM space is very competitive given the significant specialization required, and many of the perceived leaders in the market (Gartner Magic Quadrant) are relatively smaller scale.

Figure 59. Bull/Bear: Oracle Corporation (ORCL.K)




Source: Citi Research

# Wellness - Consumer

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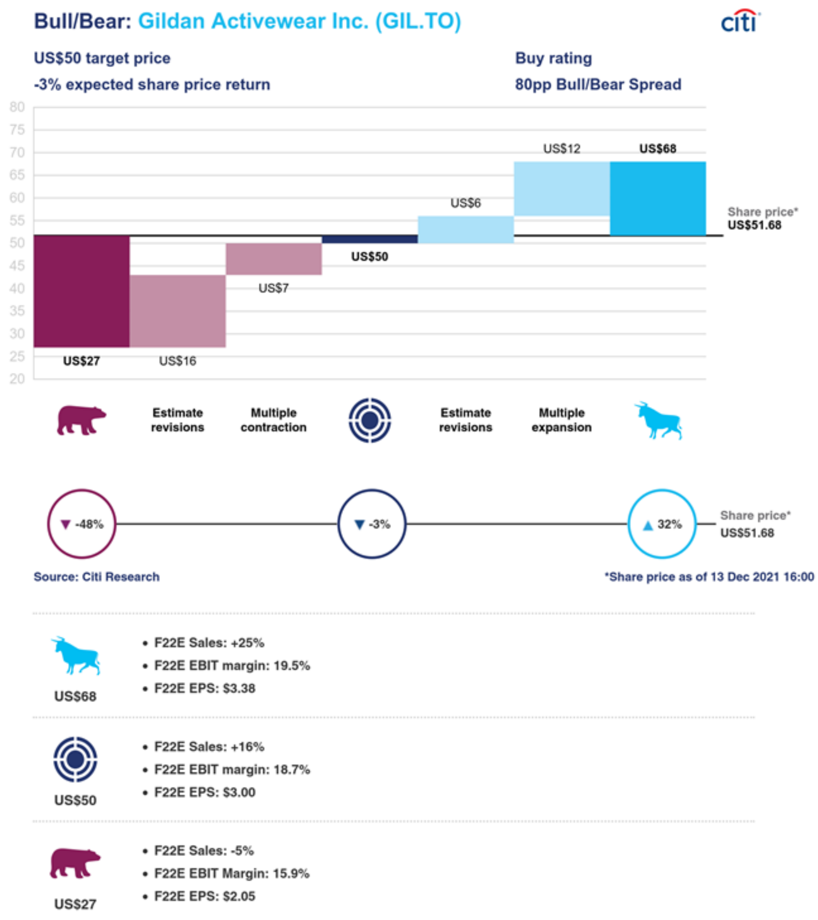
## US Retail

Generally retailers/brands are among those having to navigate supply chain pressures. Some of those pressures stem from sourcing product in Asia, which has experienced significant disruption from Covid (leading to intermittent factory closures and long lead times), as well as significantly higher costs to move product from Asia to North America. In some cases retailers and brands are rethinking their countries of origin, often targeting more “nearshoring” (which often means less sourcing out of Asia in favor of countries closer to the home North American market).

Enter Gildan (GIL). GIL is uniquely positioned with its owned manufacturing capacity located in Central America, which gives it a cost/proximity advantage vs those with Asia-based operations. While some retailers/brands that outsource their manufacturing have struggled to secure the capacity needed from many of their Asian counterparties, GIL owns the manufacturing. They are first in line, and more in control than those that don’t own their factories and/or are located in Asia.

While GIL is typically known as the low cost provider of their products (blank T-shirts, sweatshirts, polos), their Honduras-based manufacturing operations give them an even greater advantage given current market dynamics. GIL has not seen the same cost pressures, which gives them a further cost advantage versus those using Asia manufacturing that might look to increase prices to make up for inflationary cost pressures. In other words, if those using Asia based sourcing look to pass through higher prices (to offset higher costs), price gaps between GIL and competitors will widen (because GIL doesn’t face the same magnitude of cost pressures). This will put GIL in an even more favorable competitive position to help capture market share.

Figure 60. Bull/Bear: Gildan Activewear Inc. (GIL.TO)




Source: Citi Research

Nearly all retailers/brands are dealing with supply chain pressures in many forms – securing manufacturing, factory shutdowns, securing containers and shipping capacity, higher costs of boat and air, port delays, and trucking capacity (and higher costs to move product around the U.S.). Generally our view is that the retailers/ brands that we cover tend to be the largest companies in their industries with the most sophisticated supply chains, the best relationships and significant scale (which gives them more bargaining power with all counterparties). As a result we believe larger national (and international) companies will fare better than smaller players (including mom and pops). In other words, the smaller players likely feel more pain from all of the supply chain issues that are challenging the industry as a whole.

We believe this opens the door for the large retailers to continue to grow market share (the big get bigger). While talk of empty shelves for holiday and beyond is something we tend to hear from countless media sources, our view is that the retailers/brands we cover will not be the ones suffering from that dynamic. Supporting this view is that during the 3Q earnings season, inventory levels were in very good shape, with comments from management teams indicating they are well-prepared for holiday. The tone might be very different if speaking to a local shop in your hometown.

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## Australia Retail

We see downside risk to Accent's sales in 2H FY22 (end June 2022) should supply chain disruptions continue, noting key footwear manufactures (e.g. Nike, Adidas, VF Corp, Skechers) who supply product to Accent are experiencing supply shortages as a result of factories in Vietnam being closed for longer than expected and worsening supply chain delays. However, we believe Accent's excess inventory position is likely to shield the company from these issues in 1H FY22 (end December 2021).

**Related research:**

Adidas: Accent Group Ltd (AX1.AX) - Supply risks increasing for 2H FY22

Skechers: Australia & New Zealand Apparel/Footwear/Textiles - Skechers result suggests some risk for Accent in 2H FY22

VF Corp: Australia/NZ Apparel/Footwear/Textiles: Vans' issues unlikely to impact Accent… for now

Nike: Accent Group Ltd (AX1.AX): Accent's excess inventory shielding it from supply chain disruptions for now, but risks building around 2H22

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## MENA Consumer Staples & Retail

KSA discretionary retailers, including Jarir (4190.SE - Buy, TP SAR 245) , face supply shortage of electronic products if supply chain disruptions accentuates which can translate into lower volumes and impact margins on weaker operating leverage. Several management teams across the retail space in KSA indicated that freight cost growth and supply disruptions can impact margins in the short-term and more severe disruptions can weigh down on volumes sold.

Food producers in KSA, including Almarai (2280.SE – Sell, TP SAR 50), could face further margin pressure from higher shipping costs on imports of feed (alfalfa, corn and soybean among others) into KSA – we see limited risk on securing supply as Alamrai owns and operates their own farms in Europe, US and LATAM. Grocery retailers in KSA, Alothaim (4001.SE – Neutral, TP SAR 134) and BinDawood (4161.SE – Sell, TP SAR 100), can face supply shortages on some items if supply chain disruptions continue but we see limited impact on overall volumes.

Car rental operator in KSA, Budget (4260.SE – Neutral, TP SAR 44), can see disruptions to new fleet supply (replacement and growth demand) if supply chain challenges persist especially in the auto space. However, the disruptions are driving higher resale value of used cars which is translating into strong earnings growth for the company. All in all, the company has indirectly benefited from the disruptions in the global new cars supply disruptions, but further disruptions could impact their ability to replace and grow their fleet.

**Related Research:**

Jarir Marketing Company (4190.SE) - Jarir Q3 21A results: Sales growth accelerates but margins disappoint

Almarai (2280.SE) - Absorbing cost inflation as volumes retract in the GCC

Abdullah Al Othaim Markets (4001.SE) - Promotional activity drives volumes but weighs down on margins

BinDawood Holding Co (4161.SE) - Cost growth offset gross margin expansion as sales arrive flat y/y

United International Transportation Company SJSC (4260.SE) - Favorable sales mix drives margins and EPS

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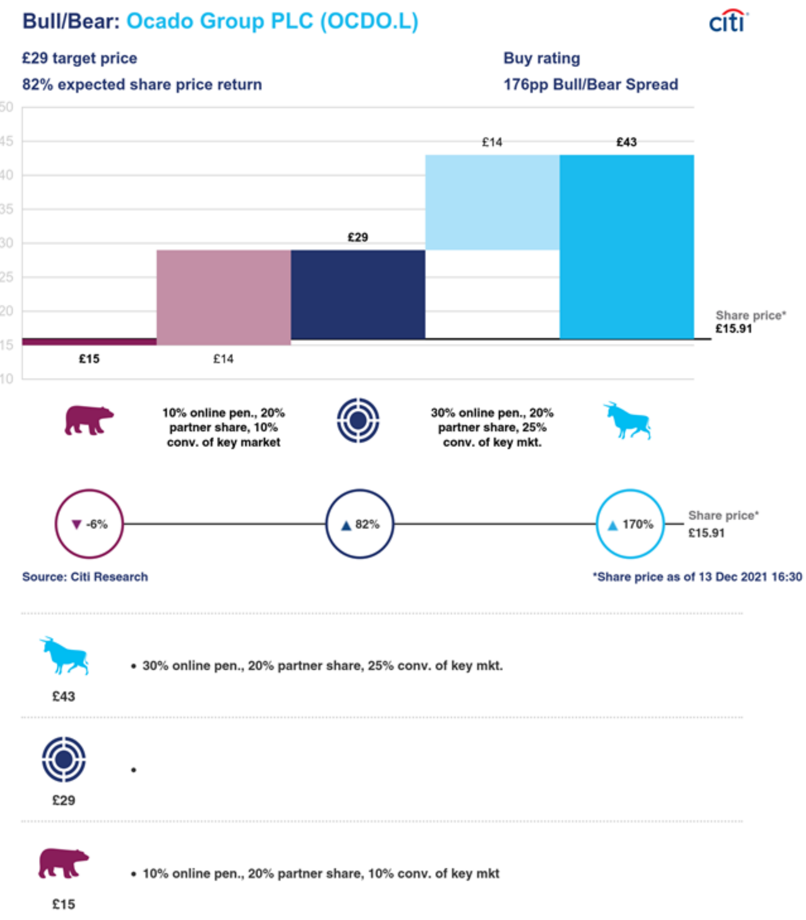
## European Retail

**OCDO.L** – Ocado Group is an online grocery retailer and end-to-end online grocery solution provider for a growing number of food retailers around the world, including Kroger in the US. The cornerstone of the solution is the Hive or automated cube storage and retrieval system which we expect to be increasingly augmented by robotic arm picking in the coming years, as the warehouses as they move towards ‘lights out’ automation with little human intervention. We also expect the solution to increasingly cater for same day delivery and ultrafast immediacy – and potentially additional retail categories – as Ocado’s partners build out ‘ecosystems’ of linked warehouses in their markets.

Figure 61. Bull/Bear: Ocado Group PLC (OCDO.L)




Source: Citi Research

# Wellness - Healthcare

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## European Pharmaceuticals

Overall MedTech companies are more resilient to supply chain issues than many other sectors as healthcare products are more prioritised. Nonetheless, companies in our coverage saw greater pressures in Q3 (from shortage of components and raw material inflation), and most management teams do not expect much improvement near term. In fact, these headwinds are expected to continue until at least 1H22 as companies attempt to mitigate risks via pre-buys/elevated inventory levels, product re-engineering (e.g. to newer chips with better availability), pricing actions (albeit limited opportunities for reimbursed categories). Wage inflation was also a bigger headwind in Q3. Among MedTech sub-sectors, Chronic Care (Coloplast and ConvaTec) is more vulnerable to supply chain challenges, while Hearing Aid is relatively less so. For example, Coloplast expects ~3% raw material price inflation in FY21/22 (raw materials account for ~50% of COGS), as well as higher wage inflation.

We compiled conference call excerpts on supply chain challenges by company, see They Said What: Supply Chain Challenges on page 5 in our report Quarterly Soundbites: A Wrap Up of 3Q21 Earnings Season.

**Figure 62. Companies Negatively Exposed to Supply Chain Disruption**

| Company Name | RIC | ETR | Rating | Price | TP | Curr | Analyst | Company Description |
|---|---|---|---|---|---|---|---|---|
| Abdullah Al Othaim Markets | 4001.SE | 22.3% | 2 | 112.2 | 134 | SAR | **Michel Salameh** | Alothaim is the largest grocery retailer in KSA in terms of store count and second in terms of sales (c.7% of total grocery market). As of FY 20, the company operates 250 stores across the Kingdom with 189 supermarkets, 7 hypermarkets, 10 wholesale stores, 44 convenience stores for a total retail space of 480k Sqm. Alothaim markets also operates 44 supermarkets in Egypt. The company is positioned as a value grocery retailer offering regular promotions. The company sells mostly grocery items (95% of sales vs.5% non-grocery). Alothaim employs a little less than 16,000 employees (c.44% Saudization) |
| Accent Group Ltd | AX1.AX | 26.3% | 2 | 2.43 | 2.99 | AUD | **Sam Teeger, CFA** | Accent Group owns and operates large number of footwear and apparel businesses in the performance and active lifestyle sectors.<br><br>Accent Group operates a number of retail chains including The Athlete's Foot, Platypus, Hype DC, Skechers, Merrell, Vans, Timberland and Podium. It also has exclusive distribution rights for 12 international brands across Australia and New Zealand. |
| Accton | 2345.TW | 12.6% | 1 | 298 | 329 | TWD | **Carrie Liu** | Established in 1988 by engineers and listed in 1995, Accton is a leading hardware supplier for networking infrastructure based in Taiwan. Accton's solutions cater to various applications including cloud data centers, carriers, as well as campus and enterprise networks. Its main products include switch, cell-site gateway, PON/GPON, WiFi AP/router, controller, consumer CPE, STB, and etc. |
| Almarai | 2280.SE | 6.1% | 3 | 48.25 | 50 | SAR | **Michel Salameh** | Almarai is the largest integrated consumer food producer in MENA, it also ranks among the top dairy producers globally. Almarai produces and distributes dairy (fresh and UHT milk), juice, bakery, poultry, cheese and butter across the GCC and operates in Egypt under IDJ (milk and juice). The company is also vertically integrated, owning and operating its own dairy farms in KSA and feed farms in the US, Europe and Argentina. Almarai commends the highest market share across its major products in KSA and the GCC, supported by its comprehensive distribution network. |
| Altice USA | ATUS.N | 37.9% | 2 | 15.23 | 21 | USD | **Michael Rollins, CFA** | Altice acquired two US cable firms: Suddenlink in 2015 and Cablevision in 2016. Altice USA is a large broadband communications and video services provider in the United States and markets its services under two brands: Optimum, in the New York metropolitan area, and Suddenlink, principally in markets in the south-central United States. Altice delivers broadband, pay television, telephony services, proprietary content, and advertising services to approximately 4.9 million residential and business customers. Its footprint extends across 21 states through a fiber-rich broadband network with more than 8.7 million homes passed as of December 31, 2018. |
| Americold Realty Trust | COLD.N | 1.7% | 2 | 32.63 | 32 | USD | **Michael Bilerman** | Americold is the world's largest publicly traded REIT focused on the ownership, operation, acquisition, and development of temperature-controlled warehouses. Based in Atlanta, Georgia, Americold owns and operates 248 temperature-controlled warehouses, with more than 1.5 billion refrigerated cubic feet of storage, in North America, Europe, Asia-Pacific, and South America. Americold's facilities are an integral component of the supply chain connecting food producers, processors, distributors, and retailers to consumers. |
| Apollo Tyres | APLO.BO | 39.1% | 1 | 217 | 300 | INR | **Arvind Sharma** | Apollo Tyres is a leading tyre maker in India that caters to vehicles across segments. It leads the truck and bus tyres segment in India and has a strong presence in the passenger vehicles radials (PCR) segment. In the 2W tyres segment, the company is a newcomer. In 2009, Apollo Tyres acquired Vredestein Banden BV to expand into Europe, and in 2016 it acquired Reifencom, a German company engaged in the distribution of tyres, rims and accessories, to expand its sales network in Europe. The company's products are marketed under the "Apollo", "Vredestein", and "Kaizen" brands, with "Vredestein" focusing on the high performance, winter and all-season passenger tyre segments in Europe and "Kaizen" on the truck and bus cross-ply tyres in India. The company has six manufacturing facilities: four in India and two in Europe. |
| AT&T Inc | T.N | 38.2% | 1 | 22.495 | 29 | USD | **Michael Rollins, CFA** | AT&T Inc (T) is the largest communications company in the United States, with nationwide video and wireless businesses and a regional fixed broadband business. Internationally, AT&T provides wireless services in Mexico and video in Latin America. AT&T also owns WarnerMedia, a leading creator of content. |
| Bajaj Auto | BAJA.BO | -7.1% | 3 | 3295 | 2900 | INR | **Arvind Sharma** | Bajaj Auto (BAL) is a leading Indian auto OEM that is well positioned in the domestic motorcycle segment as the second-largest competitor with around 20% market share, and is the largest participant in the domestic 3-wheeler industry with a c60% market share. The company is India's largest exporter of 2-wheelers (around 57% of total industry exports) and 3-wheelers (around 66% of total industry exports). |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Balkrishna Industries | BLKI.BO | 30.1% | 1 | 2246.05 | 2900 | INR | **Arvind Sharma** | Balkrishna Industries Limited (BKT) is a leading Indian manufacturer of Off-Highway Tyres, exporting primarily to the European and North American markets. The company's focus segments include agricultural, construction and industrial vehicles as well as earthmoving, port and mining, ATV, and gardening applications. Per mgmt., BKT is India's Largest Off-highway tyre manufacturer and has around 5-6% market share in the global Off-Highway tyre industry. The company has four manufacturing plants, all situated in India, with overall production capacity of around 285,000 tonnes per year. The company has announced a capex plan to increase annual capacity to 360,000 tonnes by FY23. |
| Bharat Forge | BFRG.BO | -4.0% | 3 | 733.15 | 700 | INR | **Arvind Sharma** | Bharat Forge is a global-scale forging major and one of the largest exporters of auto components in India. As global automakers increase component outsourcing to offset declining profitability, Bharat Forge sees a larger export market, as well as steady sales domestically. The company has also significantly increased its presence in the non-autos space. Bharat Forge also has a clutch of foreign subsidiaries that primarily cater to the European market. |
| BinDawood Holding Co | 4161.SE | 3.7% | 3 | 99.3 | 100 | SAR | **Michel Salameh** | Established in 1984, BinDawood is the third largest grocery player in KSA with 8.7% market share in FY 19. The company operates 73 stores under two brands (i) Danube (46 stores - 64% of revenues) which caters to mid/high-income segment and BinDawood (27 stores - 36% of revenues) that targets the middle segment and has a strong presence in the Makkah (9% of revenues from 5 stores that caters to pilgrims). Hypermarkets are the dominant format and generate c.80% of sales (60% Danube Hypermarkets). 60% of sales are grocery items, 26% fresh-food and 14% non-food items. The company has an online platform that delivers from 31 stores currently (targeting 50 stores by YE), online sales reached 1.3% in F Y19. |
| Charter Communications | CHTR.O | 14.9% | 2 | 617.945 | 710 | USD | **Michael Rollins, CFA** | Charter Communications, Inc. is a provider of cable services in the United States, offering a variety of entertainment, information and communications solutions to residential and commercial customers. The company's infrastructure consists of a hybrid of fiber and coaxial cable plant passing approximately 51 million locations in the U.S. As of December 31, 2018, Charter served approximately 28 million customer relationships. |
| Coloplast | COLOb.CO | 9.5% | 1 | 1068.5 | 1150 | DKK | **Kate Kalashnikova, CFA** | Coloplast is a Danish company that manufactures medical devices and provides services in Ostomy (40% of group revenue), Continence (36%), Interventional Urology (11%) and Wound & Skin Care (13%). Coloplast is the global market leader in Chronic Care with ~40% share in these attractive markets with annuity-like revenue stream. Europe is the biggest market for Coloplast (58% of sales) and 25% of sales are from other DMs. |
| Compal Electronics | 2324.TW | 11.9% | 2 | 23.85 | 24.8 | TWD | **Carrie Liu** | Established in 1984, Compal Electronics is a Taiwanese original design manufacturer (ODM) of notebook (NB) PCs for various NB brands including Acer, Dell, Toshiba, HPQ, and Lenovo. It is the world's second-largest NB ODM in terms of shipments in 2014, next to Quanta Computer. |
| Consolidated Communications | CNSL.O | 1.4% | 2 | 7.89 | 8 | USD | **Michael Rollins, CFA** | Consolidated Communications is a rural local exchange carrier (RLEC), providing communications services to its customer (residential, commercial, and carrier) across 24 states. The company's related businesses complement its core telephone and Internet business and include directory publishing, enterprise cloud products, and wholesale fiber optic-based services. |
| ConvaTec | CTEC.L | 29.6% | 2 | 1.8595 | 2.35 | GBP | **Kate Kalashnikova, CFA** | ConvaTec manufactures and distributes products in Advanced Wound Care (31% of normalised FY19 group sales), Ostomy Care (29%), Continence and Critical Care (25%) and Infusion Care (15%). ConvaTec's presence spans 100+ markets with the US accounting for ~40% of group sales, Europe ~40%, other DMs ~10% and EMs ~10%. |
| DISH Network Corp | DISH.O | 58.2% | 1 | 32.88 | 52 | USD | **Michael Rollins, CFA** | DISH Network Corporation (DISH) owns and operates the DISH Network. The DISH network is widely regarded as the low-cost video service provider in the industry. The company initially targeted rural markets, but with the rollout of local channels, DISH has successfully extended its reach into metropolitan markets. |
| EchoStar Corporation | SATS.O | 11.3% | 2 | 26.06 | 29 | USD | **Michael Rollins, CFA** | EchoStar, through its Hughes segment, is a global provider of broadband satellite technologies and broadband Internet services to home and small office customers and broadband network technologies, managed services, equipment, hardware, satellite services and communications solutions to consumers, aeronautical, enterprise and government customers. The Hughes segment also designs, provides, and installs gateway and terminal equipment to customers for other satellite systems. At the end of 2020, Hughes serviced 1.6mn broadband subscribers across the Americas. |
| Eicher Motors | EICH.BO | 33.4% | 1 | 2483 | 3300 | INR | **Arvind Sharma** | Eicher Motors is an Indian automobile company that manufactures and sells high-end cruiser motorcycles under the Royal Enfield brand. The company also manufactures and sells a wide range of commercial vehicles from its JV with Volvo. Through its subsidiaries, Eicher Motors makes auto components as well as provides engineering services. |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Hon Hai Precision | 2317.TW | 66.9% | 1 | 104.5 | 170 | TWD | **Carrie Liu** | Established in 1974, Hon Hai has become the largest EMS player in the world in terms of sales. Through its vertical integration model or "eCMMS" (e-enabled Components, Modules, Moves and Services), it provides components, modules and system assembly products to many global OEMs in the PC, communication and consumer sectors. |
| IHS Holding Ltd | IHS.N | 63.8% | 1 | 12.82 | 21 | USD | **Michael Rollins, CFA** | IHS Holdings is a pure-play emerging markets wireless infrastructure provider spanning 9 countries across 3 regions. The company predominantly offers tower colocation, as well as other elements of shared wireless infrastructure including small-cells and DAS systems. The company was established as a managed services and construction provider in Nigeria in 2001 before acquiring its first tower portfolio in 2009. Since then, the company has grown its portfolio through acquisitions and build-to-suits. More recently, IHS expanded into additional infrastructure offerings, including fiber. IHS towers now operates 30k towers of which 81% are in Africa, 15% in Latin America, and 4% in the Middle East. The largest country exposure is in Nigeria with 55% of its towers, contributing 74% of total revenue. |
| Inventec | 2356.TW | 20.6% | 1 | 25.5 | 28.9 | TWD | **Carrie Liu** | Established in 1975 and listed in 1996, Taiwan-based Inventec is a key ODM of NBs, servers, smartphones, and wearable/IoT devices to global customers. Major shareholders include the founder Mr. Yeh Kuo-I, whose family has (both directly and indirectly) a c35% stake. |
| Jarir Marketing Company | 4190.SE | 30.7% | 1 | 194.4 | 245 | SAR | **Michel Salameh** | Jarir operates 63 stores across the GCC (54 stores inside KSA) and targets 80 stores by 2025 across the GCC. The company sells electronics, stationary and office supplies. Jarir launched its online platform in 2017, with sales in FY 20 reaching 13% of total sales. |
| Liberty Broadband Corp. Class C | LBRDK.O | 32.7% | 1 | 149.98 | 199 | USD | **Michael Rollins, CFA** | Liberty Broadband's principal assets consist of about 59.5 million Charter shares, the operations of GCI Liberty, and a small operating business, Skyhook, which provides mobile positioning and contextual location intelligence solutions. |
| Liberty Latin America Ltd | LILAK.O | 60.6% | 1 | 11.205 | 18 | USD | **Michael Rollins, CFA** | Liberty Latin America is a leading provider of fixed, mobile, and subsea telecommunications services in Latin America, South America, and the Caribbean. LLA was formed through the split-off of assets from Liberty Global after the acquisition of Cable & Wireless, and currently operates in 40 countries across the region. At the end of 2018, LLA served 3.0 million fixed line customers and 3.5 million mobile subscribers. |
| Lumen | LUMN.N | 16.0% | 2 | 12.07 | 13 | USD | **Michael Rollins, CFA** | Lumen, previously known as CenturyLink, is the third-largest communications company in the US, providing communications services to both residential and business customers. The bulk of Lumen's consumer access lines are located in the Southeast and Western parts of the United States. The company was founded in 1930 and was incorporated, formally, as CenturyTel in 1968. Since its listing on the NYSE in 1978, the company has primarily grown through acquisitions, most recently Level 3 in November 2017. |
| Maruti Suzuki India | MRTI.BO | 14.1% | 1 | 7490 | 8500 | INR | **Arvind Sharma** | Maruti Suzuki is a subsidiary of Suzuki Motor Corp., which holds a 56.37% equity stake. With its early mover advantage in India, Maruti is a dominant competitor in the domestic passenger car market with a c.60% market share. The company's market share in overall domestic PV segment (cars, UVs and vans) is around 45%. |
| PACCAR Inc. | PCAR.O | 14.4% | 1 | 89.95 | 100 | USD | **Timothy Thein, CFA** | Bellevue, Washington-based PCAR is a 100-plus year company, with roots dating back to 1905 when William Pigott, Sr. founded Seattle Car Manufacturing Company. PCAR's truck operations generated revenue of $25.6 billion in 2019, and another $1 billion in its Financial Services operations. The company is a manufacturer of heavy duty Class 8 commercial trucks, medium-duty class 4-7 trucks, and aftermarket truck parts. PCAR's brands include Kenworth, Peterbilt and DAF brands, which are sold in North America, South America, U.K., Europe, the Middle East, Australia and Africa. PCAR distributes aftermarket parts to its dealers through a worldwide network of Parts Distribution Centers. Parts and services accounted for 16% of total company sales in 2019, but closer to 30% of operating profits. PCAR Financial Services, which helps facilitate the sale of PCAR products in many of its geographic markets, represented ~10% of 2018 pre-tax earnings. |
| Pegatron | 4938.TW | 10.0% | 2 | 67.5 | 70 | TWD | **Carrie Liu** | Pegatron was established in 2007 and spun off its parent in June 2010. Pegatron provides Design and Manufacturing Services (DMS) to NB PC brands and other consumer electronics vendors including Apple. Its product lines include smartphones, tablets, motherboards, desktop PCs, notebook PCs, game consoles, networking equipment, set- top boxes, and LCD TVs. |
| Quanta Computer | 2382.TW | -5.7% | 2 | 89.3 | 79 | TWD | **Carrie Liu** | Founded in 1988, Quanta Computer is a Taiwan-based original design manufacturer (ODM) of notebook (NB) PCs and other electronic hardware. It is the world's largest NB ODM in terms of shipments, with major customers including the leading Taiwan, US and Japanese electronics brands. In addition to notebooks, Quanta is expanding into Cloud-related product development, which accounts for 10-15% of total revenues in 2014. |

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|---|---|---|---|---|---|---|---|---|---|
| Telephone & Data Systems Inc | TDS.N | 50.0% | 1 | 19.8 | 29 | USD | **Michael Rollins, CFA** | Telephone & Data Systems, Inc. is a diversified telecommunications services company, providing wireline, cable, HMS and wireless service to customers in 36 states. The company offers a diverse range of products, including local and long distance telephone service, data and Internet services, and video services to its rural and suburban markets. |
| T-Mobile US | TMUS.O | 31.3% | 1 | 118.022 5 | 155 | USD | **Michael Rollins, CFA** | T-Mobile US is a national wireless communications carrier that offers wireless broadband personal communication services, and was formed as a result of the merger of T-Mobile USA and MetroPCS on May 1, 2013. The combined company offers postpaid and prepaid wireless services covering over 305 million people, with a combined 80.9 million customers making it the third largest wireless carrier in the US. |
| TVS Motor | TVSM.BO | -17.8% | 3 | 663.35 | 540 | INR | **Arvind Sharma** | TVS Motor is a part of the TVS Group and is the third largest 2-wheeler OEM in terms of domestic volumes and is the second largest in terms of exports from India. The company also manufactures 3-wheelers where its share in domestic market is low but in the export market, it is the second largest in volumes. The company has a subsidiary in Indonesia which manufactures, sells, and exports 2-wheelers. TVS Motor's domestic subsidiary, Sundaram Auto Components Ltd., manufactures and sells auto components. TVS Motor has recently entered into a strategic partnership with BMW Motorrad to develop and manufacture sub-500cc bikes both for domestic markets as well as exports. |
| United International Transportation Company SJSC | 4260.SE | -2.3% | 2 | 46.9 | 44 | SAR | **Michel Salameh** | United International transport company (Budget) operates c.26k vehicles as of Dec-20 and engages in short-term rentals (daily - 31% of the fleet), long-term vehicle leasing (40% of fleet - 1-3 year contracts) and commercial vehicles leasing (28% of the fleet). The majority of the company's customers are corporates looking to stay asset lights, and corporate travel. The company replaces vehicles on an average of 1-3 years and generates a sizeable income from vehicle resale. |
| United States Cellular Corp | USM.N | 38.5% | 1 | 31.76 | 44 | USD | **Michael Rollins, CFA** | US Cellular (USM), the nation's fifth-largest wireless service provider, manages approximately 4.9 million customers in 147 markets in 26 states. US Cellular was founded in 1983 by Telephone & Data Systems (TDS), which currently owns 85% of the company. |
| Verizon Communications Inc | VZ.N | 25.3% | 2 | 50.71 | 61 | USD | **Michael Rollins, CFA** | Verizon Communications Inc. (VZ) is the second-largest telecommunications carrier within the U.S., operating a nationwide wireless and enterprise business with a consumer wireline operation in the Northeast. The company had around $128 billion in revenue, 7 million fixed broadband connections, 10 million local lines, and 121 million wireless retail subscribers (postpaid and prepaid) at the end of 2020, providing the full bundle of services, including local voice, long distance, and data to residential and business customers. |
| VTech Holdings | 0303.HK | 3.6% | 3 | 59.3 | 56 | HKD | **Eric Lau** | VTech is the world's largest cordless phone company on an ODM and OBM basis. It has 33% global share under brands VTech and AT&T. Besides, we estimate VTech is the global leader in electronic learning products (ELPs) from infancy to preschool. Revenue breakdown for cordless phone, ELPs, and Contract Manufacturing Services (CMS) was 25%, 43%, and 32% in FY18. Revenues from America, Europe, Asia, and other regions were 49%, 40%, 10%, and 1% of the total, respectively, in FY18. Mr. Allan Wong is co-founder and chairman, and is the largest shareholder with a 35% stake. |
| Westports Holdings | WPHB.KL | 29.2% | 1 | 4.01 | 5.03 | MYR | **Kaseedit Choonnawat** | Westports began port development and management operations in Port Klang, Malaysia, in 1994 with concession rights that extend until Aug 31, 2024. As of 2020, Westports operated with a total quay length of ~8.8km. The company expanded capacity from 2m TEUs in 1996 to 14m TEUs by 2020, with 65 ship-to-shore cranes. Westports is one of the busiest ports in South East Asia. Its current concession expands to 2054. |
| Wistron | 3231.TW | 52.8% | 1 | 29 | 42 | TWD | **Carrie Liu** | Wistron is a major Original Design Manufacturer (ODM) for notebook PCs (NB) in Taiwan. It was the manufacturing arm of Acer before being spun off in 2002. While Acer remains its major customer, Wistron has diversified its customer base to other NB PC brands. Besides NBs, Wistron also makes desktop PCs, servers, LCD TVs, and handheld devices. |
| Wiwynn | 6669.TW | 32.4% | 1 | 1070 | 1385 | TWD | **Carrie Liu** | Established in April 2012 and listed in March 2019, Wiwynn is one of the leading cloud infrastructure providers focusing on servers, storage and rack solutions for global CSPs' data centers. Key customers include Microsoft and Facebook, which together accounted for >90% of sales with tier-2 (next wave) CSPs such as Twitter accounting for single-digit percentage of sales. Wiwynn runs an asset-light business model, as around 65% of the server motherboard manufacturing and rack final assembly is outsourced to Wistron (3231.TW), who is the parent company of Wiwynn and still holds 50.8% stake after the IPO. FINI holding as of 16 January was c20.6%, the lowest among server/NB ODMs. |
| Yue Yuen Industrial | 0551.HK | 5.8% | 3 | 12.76 | 13.5 | HKD | **Eric Lau** | Founded in 1988, Yue Yuen has become the world's largest manufacturers of branded athletic and casual footwear as an OEM/ODM for several major brands. Listed on the Hong Kong Stock Exchange in 1992, it is 7% directly owned by the Tsai family of Taiwan and ~50% owned by the family-controlled Pou Chen. Yue Yuen set up its first production facilities in Zhu Hai in China in 1988, and other facilities were established later in Dongguan and Zhongshan in China as well as in Indonesia (1992) and Vietnam (1996). In 2017, it |

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| | | | | | | | | produced 322m pairs of shoes through production sites in China (20% of total output), Vietnam (44%), Indonesia (34%), and elsewhere. Shoes mfg and retail (under Pou Sheng) segments constituted 71% and 29% of total turnover in 2017. Yue Yuen listed its retail subsidiary Pou Sheng in June 2007. |

Pricing correct as of markets close, 13 December 2021

Source: Citi Research

**Figure 63. Companies Mentioned**

| Company Name | RIC | Rating | Curr | Price |
|---|---|---|---|---|
| A.P. Møller - Mærsk A/S | MAERSKb.CO | 1 | DKK | 21400 |
| Abdullah Al Othaim Markets | 4001.SE | 2 | SAR | 112.2 |
| Accent Group Ltd | AX1.AX | 2 | AUD | 2.43 |
| Accton | 2345.TW | 1 | TWD | 298 |
| adidas | ADSGn.DE | 1 | EUR | 249.3 |
| Aecom | ACM.N | 1 | USD | 73.6 |
| Almarai | 2280.SE | 3 | SAR | 48.25 |
| Altice USA | ATUS.N | 2 | USD | 15.23 |
| Amazon.com, Inc. | AMZN.O | 1 | USD | 3360.4 |
| Americold Realty Trust | COLD.N | 2 | USD | 32.63 |
| Apollo Tyres | APLO.BO | 1 | INR | 217 |
| Arrow Electronics Inc | ARW.N | 2 | USD | 125.58 |
| Ashok Leyland | ASOK.BO | 1 | INR | 125.85 |
| AT&T Inc | T.N | 1 | USD | 22.495 |
| Autostore | AUTO.OL | 2 | NOK | 36.075 |
| Avnet Inc | AVT.O | 2 | USD | 39.23 |
| Bajaj Auto | BAJA.BO | 3 | INR | 3295 |
| Balkrishna Industries | BLKI.BO | 1 | INR | 2246.05 |
| Bharat Forge | BFRG.BO | 3 | INR | 733.15 |
| BinDawood Holding Co | 4161.SE | 3 | SAR | 99.3 |
| CDW Corp | CDW.O | 1 | USD | 191.99 |
| Charter Communications | CHTR.O | 2 | USD | 617.945 |
| Coloplast | COLOb.CO | 1 | DKK | 1068.5 |
| Compal Electronics | 2324.TW | 2 | TWD | 23.85 |
| Consolidated Communications | CNSL.O | 2 | USD | 7.89 |
| ConvaTec | CTEC.L | 2 | GBP | 1.8595 |
| COSCO Shipping Ports | 1199.HK | 1 | HKD | 6.6 |
| CSX Corp. | CSX.O | 1 | USD | 36.05 |
| Deutsche Post | DPWGn.DE | 1 | EUR | 53.24 |
| DISH Network Corp | DISH.O | 1 | USD | 32.88 |
| Duke Realty Corp | DRE.N | 1 | USD | 61.86 |
| EchoStar Corporation | SATS.O | 2 | USD | 26.06 |
| Eicher Motors | EICH.BO | 1 | INR | 2483 |
| Gildan Activewear Inc. | GIL.TO | 1 | CAD | 52.3 |
| GLP J-REIT | 3281.T | 1 | JPY | 191600 |
| Goodman Group | GMG.AX | 1 | AUD | 26.13 |
| Hapag Lloyd AG | HLAG.F | 1 | EUR | 229.6 |
| Hon Hai Precision | 2317.TW | 1 | TWD | 104.5 |
| Honeywell International Inc. | HON.O | 1 | USD | 211.54 |
| IHS Holding Ltd | IHS.N | 1 | USD | 12.82 |
| International Container Terminal Services | ICT.PS | 1 | PHP | 195.5 |
| Inventec | 2356.TW | 1 | TWD | 25.5 |
| J.B. Hunt Transport Services Inc. | JBHT.O | 1 | USD | 200.975 |
| Jabil Inc | JBL.N | 1 | USD | 64.1 |
| Jacobs Engineering | J.N | 1 | USD | 141.31 |
| Jarir Marketing Company | 4190.SE | 1 | SAR | 194.4 |
| JD Logistics | 2618.HK | 1 | HKD | 27.45 |
| JD.com | JD.O | 1 | USD | 76.94 |
| KION Group | KGX.DE | 1 | EUR | 97.06 |
| Kornit Digital | KRNT.O | 1 | USD | 138.43 |
| LG Innotek | 011070.KS | 1 | KRW | 302500 |
| Liberty Broadband Corp. Class C | LBRDK.O | 1 | USD | 149.98 |
| Liberty Latin America Ltd | LILAK.O | 1 | USD | 11.205 |
| Lumen | LUMN.N | 2 | USD | 12.07 |
| Mahindra & Mahindra | MAHM.BO | 1 | INR | 836.5 |
| Markforged Holding Corp | MKFG.N | 2 | USD | 5.45 |
| Maruti Suzuki India | MRTI.BO | 1 | INR | 7490 |
| Nike Inc | NKE.N | 2 | USD | 166.69 |
| Norfolk Southern Corp. | NSC.N | 1 | USD | 285.9 |
| Ocado Group PLC | OCDO.L | 1 | GBP | 17.072752 |
| Oracle Corporation | ORCL.K | 2 | USD | 101.02 |
| PACCAR Inc. | PCAR.O | 1 | USD | 89.95 |

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|---|---|---|---|---|
| Pegatron | 4938.TW | 2 | TWD | 67.5 |
| Prologis Inc | PLD.N | 1 | USD | 158.41 |
| Quanta Computer | 2382.TW | 2 | TWD | 89.3 |
| Rexford Industrial Realty Inc. | REXR.N | 1 | USD | 75.2 |
| Rockwell Automation | ROK.N | 1 | USD | 351.02 |
| SAP SE | SAPG.DE | 2 | EUR | 121.2 |
| SEGRO | SGRO.L | 1 | GBP | 13.86 |
| Shenzhou Int'l | 2313.HK | 1 | HKD | 158.4 |
| SMC | 6273.T | 1 | JPY | 76210 |
| Synnex Corp | SNX.N | 1 | USD | 107.46 |
| Techtronic | 0669.HK | 1 | HKD | 163.5 |
| Telephone & Data Systems Inc | TDS.N | 1 | USD | 19.8 |
| T-Mobile US | TMUS.O | 1 | USD | 118.0225 |
| Traxion | TRAXIONA.MX | 1 | MXN | 31.74 |
| TSMC | 2330.TW | 1 | TWD | 599 |
| TVS Motor | TVSM.BO | 3 | INR | 663.35 |
| Union Pacific Corp. | UNP.N | 1 | USD | 245.94 |
| United International Transportation Company SJSC | 4260.SE | 2 | SAR | 46.9 |
| United States Cellular Corp | USM.N | 1 | USD | 31.76 |
| Verizon Communications Inc | VZ.N | 2 | USD | 50.71 |
| VTech Holdings | 0303.HK | 3 | HKD | 59.3 |
| Westports Holdings | WPHB.KL | 1 | MYR | 4.01 |
| WiseTech Global | WTC.AX | 2 | AUD | 55.95 |
| Wistron | 3231.TW | 1 | TWD | 29 |
| Wiwynn | 6669.TW | 1 | TWD | 1070 |
| Yang Ming Marine | 2609.TW | 1 | TWD | 120 |
| Yue Yuen Industrial | 0551.HK | 3 | HKD | 12.76 |
| ZIM Integrated Shipping | ZIM.N | 1 | USD | 49.12 |

Pricing correct as of markets close, 13 December 2021

Source: Citi Research

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# Appendix A-1

## ANALYST CERTIFICATION

**The research analysts primarily responsible for the preparation and content of this research report are either (i) designated by "AC" in the author block or (ii) listed in bold alongside content which is attributable to that analyst. If multiple AC analysts are designated in the author block, each analyst is certifying with respect to the entire research report other than (a) content attributable to another AC certifying analyst listed in bold alongside the content and (b) views expressed solely with respect to a specific issuer which are attributable to another AC certifying analyst identified in the price charts or rating history tables for that issuer shown below. Each of these analysts certify, with respect to the sections of the report for which they are responsible: (1) that the views expressed therein accurately reflect their personal views about each issuer and security referenced and were prepared in an independent manner, including with respect to Citigroup Global Markets Inc. and its affiliates; and (2) no part of the research analyst's compensation was, is, or will be, directly or indirectly, related to the specific recommendations or views expressed by that research analyst in this report.**

## IMPORTANT DISCLOSURES

Due to Citigroup Global Market Inc's role as a advisor to Xerox in relation to the potential combination with HP, Citi Research restricted publication of new research reports, and suspended its rating and target price on 7 November 2019 (the Suspension Date). Please note the Company price chart that appears in this report and available on Citi Research's disclosure website does not reflect that Citi Research did not have a rating or target price between the Suspension Date and 8 April 2020, when Citi Research resumed full coverage. The Firm has made a market in the publicly traded equity securities of HP Inc on at least one occasion since 1 Jan 2020.

The Firm has made a market in the publicly traded equity securities of Deutsche Post AG on at least one occasion since 1 Jan 2020.

The Firm has made a market in the publicly traded equity securities of Amazon.com Inc on at least one occasion since 1 Jan 2020.Timothy Shubsda, Research Senior Associate - C1 holds a long position in the securities of Amazon.com Inc.

Citigroup Global Markets Ltd has been appointed as sole global co-ordinator to ADIDAS in relation to their recently announced convertible bond. The Firm has made a market in the publicly traded equity securities of Adidas AG on at least one occasion since 1 Jan 2020.

The Firm has made a market in the publicly traded equity securities of Charter Communications Inc on at least one occasion since 1 Jan 2020.

The Firm has made a market in the publicly traded equity securities of SEGRO PLC on at least one occasion since 1 Jan 2020.

The Firm has made a market in the publicly traded equity securities of Yue Yuen Industrial (Holdings) Ltd on at least one occasion since 1 Jan 2020.

The Firm has made a market in the publicly traded equity securities of Coloplast A/S on at least one occasion since 1 Jan 2020.

Due to Citi's involvement in Altice USA Inc's (the Company) announced separation from Altice NV. Citi Research restricted publication of new research reports, and suspended its rating and target price on January 9th 2018 (the Suspension Date). Please note that the Company price chart that appears in this report and available on Citi Research's disclosure website does not reflect that Citi Research did not have a rating or target price between the Suspension Date and May 2nd 2018 when Citi Research resumed full coverage.

The Firm has made a market in the publicly traded equity securities of Microsoft Corp on at least one occasion since 1 Jan 2020.

The Firm has made a market in the publicly traded equity securities of Kion Group AG on at least one occasion since 1 Jan 2020.

The Firm has made a market in the publicly traded equity securities of Cisco Systems Inc on at least one occasion since 1 Jan 2020.

The Firm has made a market in the publicly traded equity securities of Under Armour Inc on at least one occasion since 1 Jan 2020.

The Firm has made a market in the publicly traded equity securities of Liberty Broadband Corp on at least one occasion since 1 Jan 2020.

The Firm has made a market in the publicly traded equity securities of CDW Corp on at least one occasion since 1 Jan 2020.

The Firm has made a market in the publicly traded equity securities of SAP SE on at least one occasion since 1 Jan 2020.

Citigroup Global Markets Inc. is acting as a manager in Prologis,Inc.'s 'at-the-market' equity offering program.Due to Citi's involvement in announced acquisition involving Prologis Inc. (PLD) (the "Company") and Liberty Property Trust (LPT), Citi Research restricted publication of new research reports, and suspended its rating and target price on October 27, 2019 (the "Suspension Date"). Please note that the Company price chart that appears in this report and available on Citi Research's disclosure website does not reflect that Citi Research did not have a rating or target price between the Suspension Date and February 4, 2020 when Citi Research resumed full coverage.

The Firm has made a market in the publicly traded equity securities of Apple Inc on at least one occasion since 1 Jan 2020.

The Firm has made a market in the publicly traded equity securities of SMC Corp on at least one occasion since 1 Jan 2020.

The Firm has made a market in the publicly traded equity securities of Lenovo Group Ltd on at least one occasion since 1 Jan 2020.

The Firm has made a market in the publicly traded equity securities of AT&T Inc on at least one occasion since 1 Jan 2020.

The Firm has made a market in the publicly traded equity securities of VF Corp on at least one occasion since 1 Jan 2020.

Due to Citigroup Global Markets Limited's involvement as financial advisor to Telefonica in relation to the announced definitive agreement for the sale of its telecommunications operations in Costa Rica to Liberty Latin America Limited, Citi Research restricted publication of new research reports and suspended its rating and target price on Liberty Latin America Limited on the 30t July 2020 ('the Suspension Date'). Please note that the Company price chart that appears in this report and available on Citi Research's disclosure website does not reflect that Citi Research did not have a rating or target price between the Suspension Date and 31 July 2020, when Citi Research resumed full coverage. The Firm has made a market in the publicly traded equity securities of Liberty Latin America Ltd on at least one occasion since 1 Jan 2020.

The Firm has made a market in the publicly traded equity securities of Shenzhou International Group Holdings Ltd on at least one occasion since 1 Jan 2020.

The Firm has made a market in the publicly traded equity securities of Paccar Inc on at least one occasion since 1 Jan 2020.

The Firm has made a market in the publicly traded equity securities of Union Pacific Corp on at least one occasion since 1 Jan 2020.

The Firm has made a market in the publicly traded equity securities of CSX Corp on at least one occasion since 1 Jan 2020.

The Firm has made a market in the publicly traded equity securities of Nike Inc on at least one occasion since 1 Jan 2020.

The Firm has made a market in the publicly traded equity securities of Ocado Group PLC on at least one occasion since 1 Jan 2020.

The Firm has made a market in the publicly traded equity securities of Oracle Corp on at least one occasion since 1 Jan 2020.

The Firm has made a market in the publicly traded equity securities of Kornit Digital Ltd on at least one occasion since 1 Jan 2020.

The Firm has made a market in the publicly traded equity securities of Honeywell International Inc on at least one occasion since 1 Jan 2020.

The Firm has made a market in the publicly traded equity securities of Norfolk Southern Corp on at least one occasion since 1 Jan 2020.

Due to Citigroup Global Markets Limited acting as advisor to GLP Capital on the announced acquisition of Goodman Group's (the 'Company') Central and Eastern Europe logistics real estate portfolio, Citi Research suspended its rating and target price on 25 March 2020 (the Suspension Date). Please note that the Company price chart that appears in this report and available on Citi Research's disclosure website does not reflect that Citi Research did not have a rating or target price between the Suspension Date and 9 July 2020 when Citi Research resumed full coverage.

The Firm has made a market in the publicly traded equity securities of Techtronic Industries Co Ltd on at least one occasion since 1 Jan 2020.

Citigroup Global Markets Limited acted as bookrunner in the initial public offering of ZIM Integrated Shipping Services Ltd.

The Firm has made a market in the publicly traded equity securities of Jarir Marketing Company SJSC on at least one occasion since 1 Jan 2020.

Due to legal reasons, Citi Research restricted publication of new research reports on Americold Realty Trust (COLD), and suspended its rating and target price on 13 October, 2020 (the Suspension Date). Please note that the Company price chart that appears in this report and available on Citi Research's disclosure website does not reflect that Citi did not have a rating or target price between the Suspension Date and 07 January, 2021 when Citi Research resumed full coverage.

The Firm has made a market in the publicly traded equity securities of Rockwell Automation Inc on at least one occasion since 1 Jan 2020.

The Firm has made a market in the publicly traded equity securities of AP Moeller - Maersk A/S on at least one occasion since 1 Jan 2020.

The Firm has made a market in the publicly traded equity securities of AECOM on at least one occasion since 1 Jan 2020.

The Firm has made a market in the publicly traded equity securities of J B Hunt Transport Services Inc on at least one occasion since 1 Jan 2020.

The Firm has made a market in the publicly traded equity securities of Kroger Co on at least one occasion since 1 Jan 2020.

The Firm has made a market in the publicly traded equity securities of T-Mobile US Inc on at least one occasion since 1 Jan 2020.

The Firm has made a market in the publicly traded equity securities of Dell Technologies Inc on at least one occasion since 1 Jan 2020.

The Firm has made a market in the publicly traded equity securities of ConvaTec Group PLC on at least one occasion since 1 Jan 2020.

The Firm has made a market in the publicly traded equity securities of Hapag Lloyd AG on at least one occasion since 1 Jan 2020.

The Firm has made a market in the publicly traded equity securities of Lumen Technologies Inc on at least one occasion since 1 Jan 2020.

The Firm has made a market in the publicly traded equity securities of COSCO Shipping Holdings Co Ltd on at least one occasion since 1 Jan 2020.

The Firm has made a market in the publicly traded equity securities of Verizon Communications Inc on at least one occasion since 1 Jan 2020.

The Firm has made a market in the publicly traded equity securities of Taiwan Semiconductor Manufacturing Co Ltd on at least one occasion since 1 Jan 2020.

Michel Salameh, Analyst, holds a long position in the securities of Microsoft Corp.,Amazon.com, Inc..

Citigroup Global Markets Inc. or its affiliates beneficially owns 1% or more of any class of common equity securities of Liberty Latin America Ltd, ZIM Integrated Shipping, Rexford Industrial Realty Inc., Dell Technologies. This position reflects information available as of the prior business day.

Citigroup Global Markets Inc. or its affiliates has a net long position of 0.5% or more of any class of common equity securities of Deutsche Post, Amazon.com, Inc., adidas, Charter Communications, Microsoft Corp., KION Group, Under Armour Inc, Lenovo Group, Liberty Latin America Ltd, Ocado Group PLC, ZIM Integrated Shipping, Aecom, The Kroger, Rexford Industrial Realty Inc., Dell Technologies, ConvaTec, TSMC.

Citigroup Global Markets Inc. or its affiliates beneficially owns 2.0% or more of any class of common equity securities of ZIM Integrated Shipping, Rexford Industrial Realty Inc., Dell Technologies.

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