



European Automotive Newsletter

- Impact of the European energy prices on the automotive industry
- Industry focus – OEM sourcing strategies
- Transaction activity
- Quarterly update of financial KPIs

November 2022

How the current energy crisis is likely to result in permanently higher energy costs

Managing the current crisis is essential for surviving, but understanding the lasting impacts is key for the longer term.

The ongoing global energy crisis since 2021 has been proven quite economically destructive due to its sheer price increase and the speed at which this has happened.

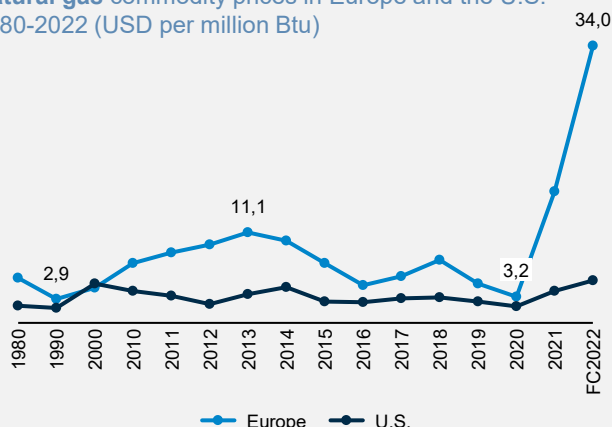
European natural gas price increased dramatically, reaching a peak of 34 USD per million Btu in August 2022. Electricity prices have risen sharply over the past year and reached the peak over 500 €/MWh². The uncertainty about a potential gas shortage especially during the winter period comes on top of the pure price increase and affects individuals, companies and societies as a whole.



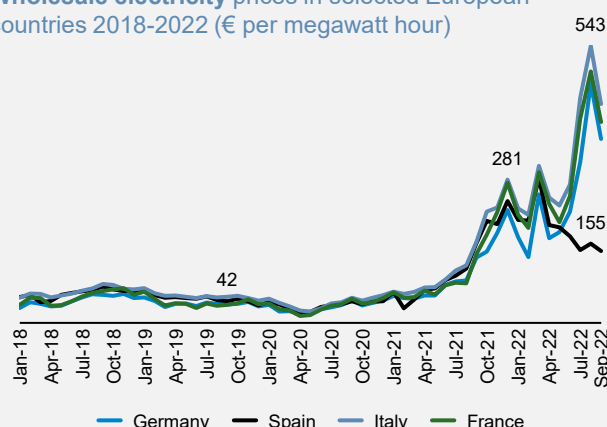
This lack of security in energy supply has shown European countries their vulnerability and is likely to result in an accelerated expansion of long-discussed renewable energy projects, investments in power grids and storage infrastructure to improve energy security and autonomy on a European level.

In the mid- to long-term this will lead to a drop in energy prices compared to the current peaks, but companies as well as individuals are well advised to base their decision making and capital allocation on the assumption that prices will remain significantly above the average pre-crisis levels.

Natural gas commodity prices in Europe and the U.S. 1980-2022 (USD per million Btu)



Wholesale electricity prices in selected European countries 2018-2022 (€ per megawatt hour)



Source: Statista, Ember

European energy crisis

How the automotive industry is affected by the current energy crisis in Europe

The automotive industry with its complex and differentiated supply chain is experiencing parallel supply issues and demand softening

Energy crisis

Consumers

- Rising interest rates and inflation are starting to weigh on **car demand**
- Customers are debating whether to buy a vehicle or push their existing leasing contract ahead driven by poor availability of cars but also due to financial concerns including surging **energy prices**

OEM

- The recent steep rise in electricity cost could lead to an overall increase **in the cost of vehicle manufacturing up to 20%**¹
- Increasing complexity in **managing suppliers** due to higher financial impact towards Tier 1 & 2 suppliers
- **Availability of material and increasing price pressure** from upstream suppliers would affect OEM as some **suppliers** are hit heavily by the energy crisis
- **Difficulty to increase** supply chain **resilience** in short term

Suppliers

- Major **raw materials** for the automobile industry, including steel, aluminium, plastics and glass components rely on energy-intensive manufacturing processes, which may further inflate automobile **production costs**
- Potential **gas shortages** endanger the **production capabilities** and available **capacities**
- **Current situation of volumes below plan and increasing costs** might be worsened through softening customer demand and increase of additional supply chain disruption in case of gas shortages and supplier bankruptcies

While all suppliers will be affected by a volume drop that is rooted in the unusual parallelism of supply and demand contraction, suppliers with energy-intensive processes will be hit the hardest.

To survive the current crisis companies will need to be more resilient in supply chain and energy management, leaner in structural cost, more rigorous in cash management and nimble in decision making

These traits will not only be important to survive the current crisis but are equally relevant to survive in the longer term in the changing automotive industry with shift to EVs, autonomous vehicles, budgets being allocated from hardware to software and OEMs pushing for CO2 neutral supply chains.

¹Source: Financial Times

European energy crisis

How to weather the current storm ...

... to emerge stronger and to master the automotive industry's shift to electric and autonomous vehicles

Dealing with the energy crisis requires a greater focus on issues than in a normal environment. Mitigating actions should be taken across the organization

Mitigation actions for automotive industry with focus on suppliers

Make Cash THE Priority

- Assess cash flow forecasting models that adequately address the requirements and risks driven by the energy crisis
- Review current policies covering hedging, foreign exchange and inventory to adjust for energy crisis and risk of recession
- Protect the value of cash by for example investing short dated maturities
- Reduce credit terms and focus on working capital management to improve cash flows

Push Price Negotiations

- Price negotiations with OEMs by suppliers, especially when suppliers are no longer able to recover cost increases by own cost-down measures

Sales & Operations Planning and further operational improvements

- Assess product processes and governance to ensure adequate coverage for energy, delivery priority scenarios development with OEM for energy shortage case
- Increase supplier network relationships and flexibility in order to capture purchasing opportunities and to reduce risk in the supply chain. Use a preferred vendor program to increase buying power. Prepare for supplier insolvencies
- Increase efficiency throughout the value chain, maximal utilization of material, machine and labour

Create Fit –For-Purpose Target Operating Model

- Simplify and streamline governance, processes, organization to release resources and increase speed of decision making in order to react to changing environment, especially for energy sensible automotive suppliers
- Leaner operating models could lead to lower fixed costs and a more agile organization

Assess & Adopt the Strategy

- Re-evaluate timing and location of planned investments for capacity increase, production relocation and other new projects
- Assess / Accelerate De-carbonisation plans as well as government grants & support
- Assess and invest in local energy generation such as solar and thermal to reduce dependency on energy supply, but also become less carbon intense
- Reduce product portfolio with support of OEM and focus on highest margin products and services that are differentiated and have pricing power in the future

Industry Focus – OEM Sourcing Strategies (1/2)

In this industry focus section, A&M explores several different methods that OEMs are utilizing to source key materials for improving production in the short-term and streamlining EV manufacturing processes for the future.

While OEMs and suppliers continue to move towards electrification, they are simultaneously battling unfavorable industry conditions and undergoing major operational shifts, coupled with increased vehicle demand. A critical operational component of the vehicle supply chain consists of parts and material sourcing, which has several changing dynamics.

In-Sourcing

After several decades of outsourcing production of more and more component parts and systems to suppliers, auto makers are entering into a new era, which necessitates a unique approach for acquiring new parts and establishing different sourcing methods. Since the onset of COVID, millions of vehicles have been lost in production and countless plant shutdowns have occurred due to the semiconductor shortage and global supply chain issues. One solution OEMs have since undertaken involves in-sourcing chips or creating business plans for bringing chip manufacturing in-house.





Tesla pioneered the movement of in-sourcing semiconductor manufacturing, which proved to pay dividends through the pandemic-era. Despite still being affected by the chip crisis, Tesla was able to mitigate supply bottlenecks and production issues more efficiently than most OEMs. The semiconductor industry is heavily dependent on Asia for both the parts and production of chips, which has led to several other auto makers announcing their intentions to bring chip production internal. GM plans to develop its own chips by 2025 to lower costs and scale volume, as the OEM works to grow its autonomous driving unit, Cruise. Hyundai and Ford are also among those working to develop their own chips, through affiliate Hyundai Mobis and partner GlobalFoundries, respectively.

OEMs have also taken a new approach for in-sourcing, which has resulted in the creation of circular economies. Car makers are under heavy pressure to navigate fractured supply chains and elevated raw material and energy prices that have limited their access to already scarce materials. Several auto makers, including Stellantis and Renault, plan to utilize this new strategy by remanufacturing, repairing, reusing, and recycling vehicle parts and materials in a closed loop setting. By doing so, Stellantis and Renault will extend the life of vehicles and their component parts, build sustainability, and aim to generate c. €2 billion in revenue by 2030.



Industry Focus – OEM Sourcing Strategies (2/2)

Additionally, in anticipation of the high consumer demand for EVs, several auto manufacturers have recently started to establish partnerships with mining companies to secure supply of crucial metals for EV batteries such as lithium, nickel, and cobalt. The table below illustrates several OEMs that have recently struck supply deals for these key resources, and the respective capital investment amounts.

OEM	Metal Type	Capital Investment for Supply Deal (€m)
	Nickel	€5,000
	Lithium	€198
	Lithium	€195
	Lithium	€52
	Lithium	€7.7

Alternative Sourcing Strategies

In addition to in-sourcing, OEMs are also engaging in other strategic alternatives to drive innovation and boost the production of EVs, particularly in the area of battery production and recycling. In an industry that has experienced high levels of volatility for consecutive years, OEMs are looking to partnerships to improve their current sourcing methodologies and establish supply chains for their electric vehicles.

While some auto makers have moved battery recycling in-house, others have formed partnerships with battery recyclers such as Redwood Materials and Li-Cycle. From legacy OEMs to EV startups, Redwood Materials and Li-Cycle have joined forces with Audi, Volkswagen, Toyota, Arrival and others. Battery recycling is a critical component of EV supply chains, helping to reduce carbon emissions and accelerate global EV adoption.

Alternatively, Volvo and Renault have taken different approaches to scaling their electric vehicle businesses. In conjunction with its Chinese parent company, Volvo has created a joint venture specializing in the powertrain business. The JV, Aurobay, aims to consolidate its legacy auto manufacturing business with its electric business unit, to improve hybrid-combustion technology, reduce costs and add scale. Conversely, Renault has joined forces with Vitesco Technologies as the OEM seeks to design and manufacture power electronics and motors in-house. The partnership is mutually beneficial and will allow Renault to build a scalable platform for its EVs, while Vitesco receives purchase contracts and improves its competitive positioning in the electric supplier space.









Throughout the automotive industry's transitional phase, initiatives to insource production and form partnerships with other companies to secure supply of critical materials will have a significant impact on automotive supply chains. At the same time, legacy sourcing strategies will continue as OEMs continue to manufacture and assemble internal combustion engine vehicles. Eventually these will merge into a new supply chain, creating both opportunities and risks for suppliers, especially those involved in propulsion systems.

Source: Automotive News, Reuters, Seeking Alpha

Transaction activity

In recent transaction news, BMW and Mercedes have announced their plans to collaborate with Amazon Web Services and Microsoft Cloud, respectively, to collect, analyze, and process vehicle data for developing new vehicle features and improving production efficiency. Intel's self-driving company, Mobileye, has officially filed for an IPO and is targeting a valuation of approximately \$20 billion after initially announcing to publicly list the company in December of 2021. Additionally, Siemens has signed a deal to supply equipment and technology for EV battery plants to a joint venture backed by Stellantis, Mercedes Benz, and Total Energies.

Key transactions

Joint Venture	Partnership	Partnership	Acquisition
 is forming a JV with  Horizon Robotics	 is partnering with  AirConsole	 is partnering with  Google Cloud	 is acquiring  SSE
Date Announced: October 13, 2022 Focus: Autonomous Technology	Date Announced: October 13, 2022 Focus: In-Vehicle Gaming	Date Announced: October 11, 2022 Focus: Vehicle Media Systems	Date Announced: September 20, 2022 Focus: Electric Vehicles

- Volkswagen Group (VW) will invest \$2.3 billion for a 60 percent equity stake in forming a new JV focused on autonomous driving technology with Chinese technology company, Horizon Robotics. VW and Horizon will collaborate to develop driving software and hardware that will accelerate the automaker's improvements in its vehicle connectivity and software capabilities.
- BMW and AirConsole have partnered to bring video game services inside the German's automaker's vehicles. AirConsole has more than 180 games, which will be playable via BMW's infotainment display. The partnership aims to drive innovation in combining technologies for every waiting moment in EVs.
- Toyota has announced its partnership with Google Cloud, in efforts to boost the OEMs artificial intelligence-based speech services and enhance its vehicle infotainment systems' voice recognition ability. The technology has already been included in several 2023 Toyota and Lexus models.
- BorgWarner has announced its intention to acquire the EV charging business of Hubei Surpass Sun Electric Company (SSE) for \$58.4 million. With the acquisition, SSE accelerates its growth in electrification and BorgWarner expands its vehicle electrification business into China.

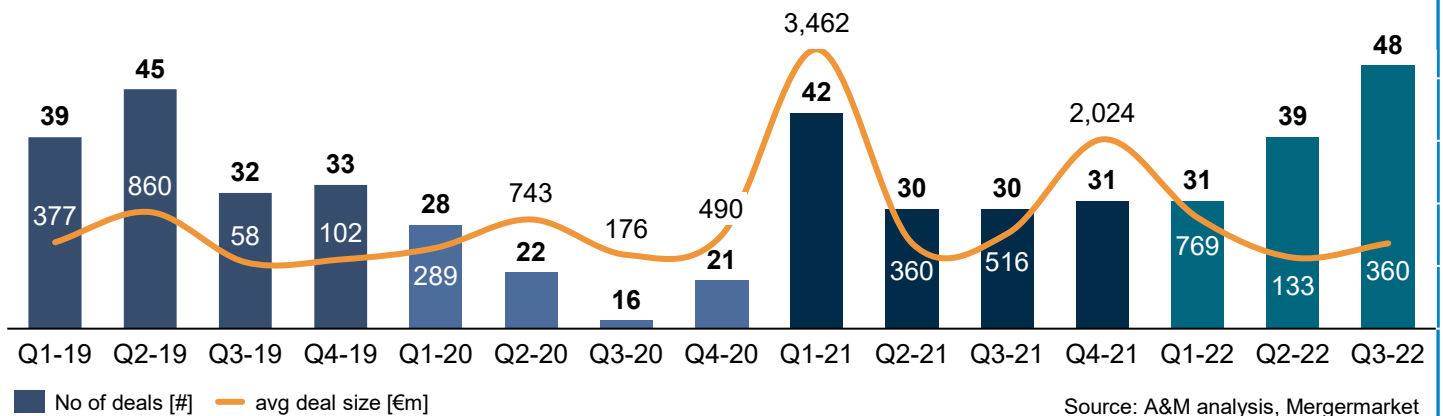
Regulatory landscape

EU combustion engine ban from 2035: The European Parliament reached an agreement on 27 October ensuring all new cars and vans registered in Europe will be zero-emission from 2035 onwards. As an intermediary step towards zero emissions, the new CO2 standards will also require average emissions of new cars to come down by 55% by 2030, and new vans by 50% by 2030.

New York Vehicle Sales Ban: New York plans to require all new vehicles sold within the state to be either electric or a plug-in electric hybrid by 2035. The rules closely follow California's ban on the sale of gasoline powered vehicles and focus on achieving zero emission vehicle sales targets, effectively phasing out internal combustion engine (ICE) vehicles by 2035.

General Motors Lawsuit: GM has recently faced a class action lawsuit stating the OEM failed to disclose to consumers that thousands of its vehicles had an engine defect. The defects allegedly include engine stalling and premature breakdowns, as well as flaws in steering wheel sensors and ignition switches. GM has been ordered to pay \$102.6 million but intends to appeal the verdict.

European M&A activity – Automotive

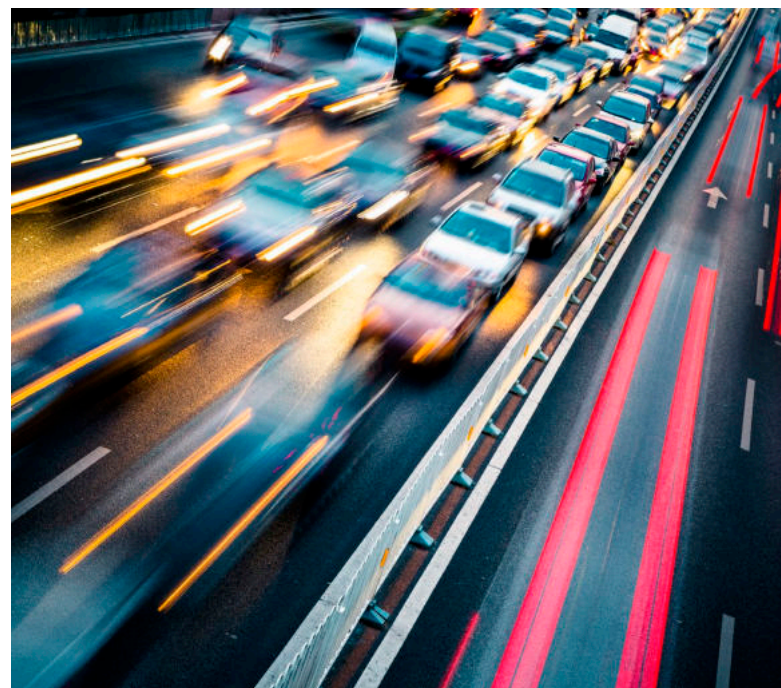


The European M&A activity in the Automotive sector showed an increasing number of transactions in Q2 and Q3-22, however, average deal size was especially in Q2-22 below the long term average of c. €750m.

Insolvency filings in Europe as well as in Germany continue to remain on a comparably low level.

Several sources like credit insurances already expected an increase in insolvency filings in HY2 2021, which for most countries did not materialize. Most recent studies forecast already for 2022 an increase of global insolvencies by 10% and by 5% for Germany.

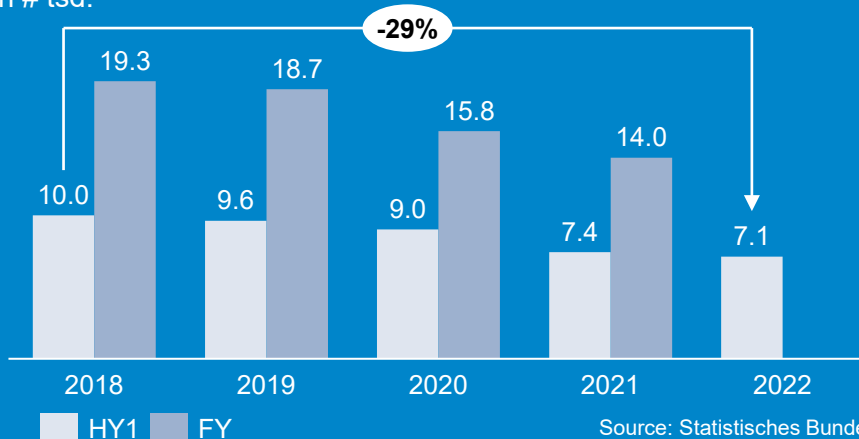
Based on the low number of insolvencies until July 2022, this would mean a comparably high number of insolvencies in HY2 2022.



Insolvency filings Germany



In # tsd.



Despite the ongoing economic and geopolitical challenges in Europe, which affect all industries, the number of insolvency filings in Germany in HY1 2022 marks another low point of Q1 filings since 2018.

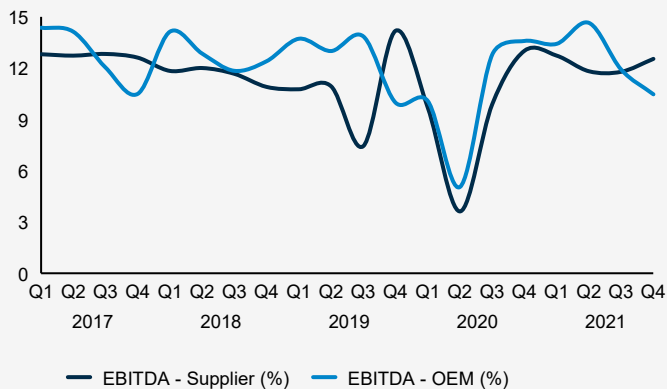
The impacts of the Ukraine war and gas crisis have not materialized in increasing insolvency numbers yet.

The July 2022 figures recently published by the German Federal Statistics Office are again the lowest July figures since 2018.

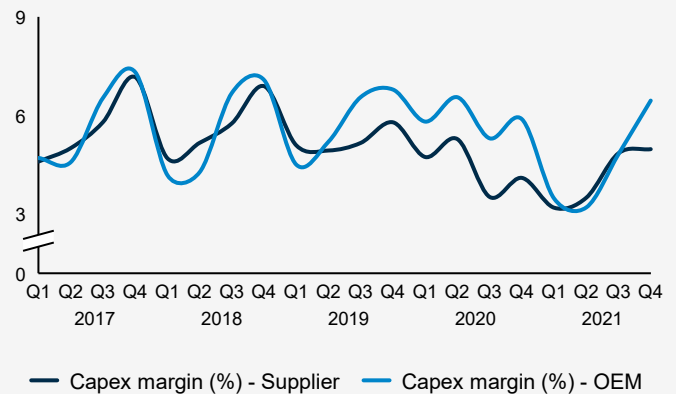
KPIs: automotive performance update

- This industry snapshot of financial KPIs compares the quarterly published results of 20 OEM and 70 automotive suppliers since 2017.
- After the recovery of Working Capital KPIs from the Corona peak, on supplier side days of inventory and sales outstanding are declining, representing a tightening of payment terms towards OEMs as well as a reduction of safety stock built to cover supply chain issues. Increasing days payables outstanding in Q4-2021 might result from increased pressure to push working capital financing.
- Capex margins of the suppliers and OEMs started to increase after a historic low in Q1 2021 with the OEMs again showing higher capex margin than suppliers in Q4-2021.

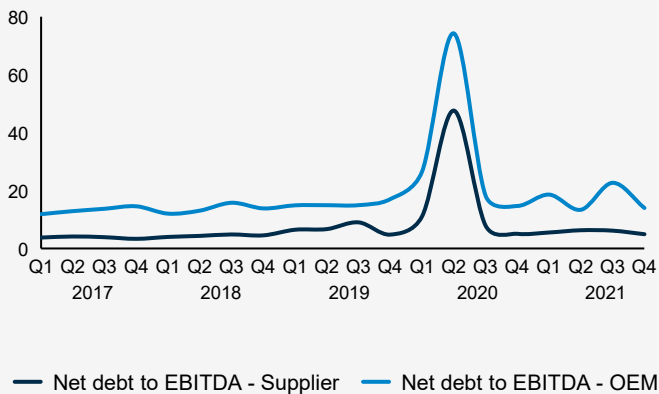
EBITDA margin (%) – Supplier vs. OEM



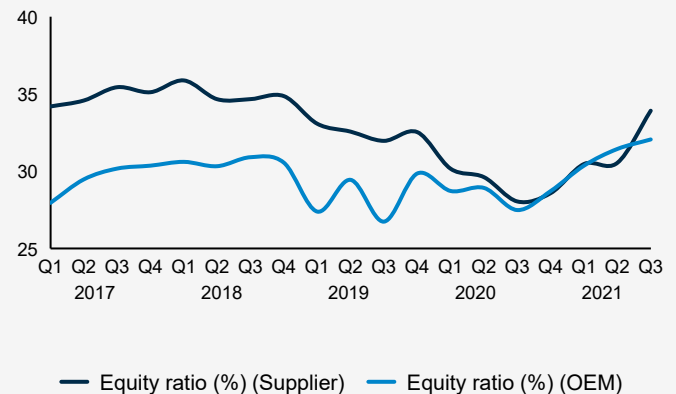
Capex margin (%) – Supplier vs. OEM



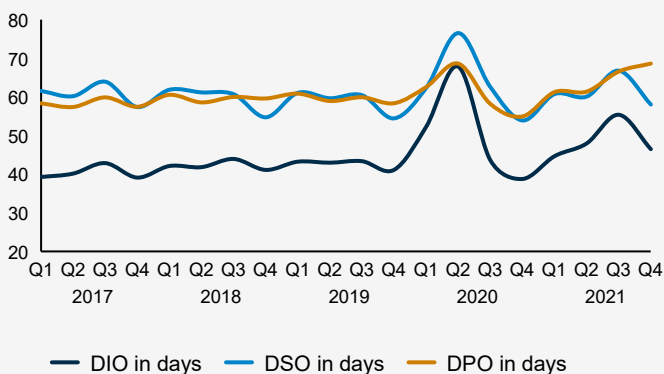
Net debt to EBITDA ratio – Supplier vs. OEM



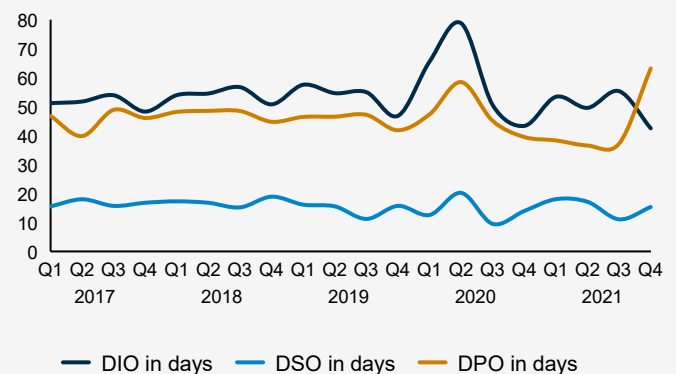
Equity ratio (%) – Supplier vs. OEM



Quarterly WC KPIs in days – Supplier



Quarterly WC KPIs in days – OEM



Source: Company Information, A&M analysis



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