

**INTERNATIONAL EQUITY**

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According to Tesla, a typical drivetrain system in one of their electric cars is comprised of around 20 components. This is about one-tenth of the two hundred or so integrated propulsion mechanisms for a traditional combustion engine car.

For investors evaluating the broader trends and transformative dynamics around electric vehicle adoption, however, there are arguably more, rather than fewer, moving parts to consider.

Most incumbent auto manufacturers and their key suppliers face competing research, design, and engineering challenges. They must maintain competitiveness in existing models and networks, while investing heavily in future productivity around batteries, fuel cells, and related infrastructure, all while maintaining profit margins that have historically left little breathing room for strategic missteps.

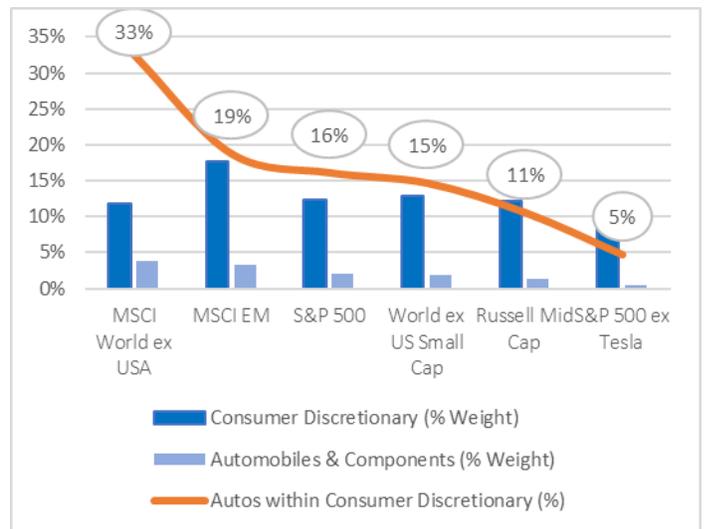
Meanwhile, just over the immediate horizon lies the prospect of autonomous vehicles, and with that, “Mobility as a Service” business models built on software and artificial intelligence. The tech giants and their unassailable financial firepower are looming large within this realm, albeit in the background for now.

Additional complicating factors include punitively stricter emissions regulations in the interim (e.g. the EU’s new caps on CO2 emissions in 2020-21), which necessitate ongoing investment in upgrading the performance of combustion engine models, and a global patchwork of tax incentives that can pull forward or amplify consumer demand trends.

Fortunately, our asset class and portfolio does not have to grapple directly with the implications stemming from Tesla’s recent gatecrashing of the S&P 500 index in the US. Given that, in recent months, the company’s profitability has been driven more by its own cryptocurrency speculation than manufacturing production rates, we count our blessings. However, Elon Musk’s innovative brand has shown enough commercial viability and disruptive success to finally galvanize incumbent manufacturers into full-blown EV commitments of their own. The upheaval has arguably hit the international equity arena harder, as Exhibit 1 illustrates.

While the overall Consumer Discretionary sector accounts for a broadly similar weight of the benchmark across different equity categories (ranging between 12% in the US and 18% in Emerging Markets), the extent to which the sector itself skews compositionally towards Autos varies considerably. For the MSCI World ex US universe, Autos accounts for one third of the Discretionary sector – typically two to three times the exposure in

**EXHIBIT 1: WEIGHT OF AUTOS & COMPONENTS WITHIN CONSUMER DISCRETIONARY BY ASSET CLASS/BENCHMARK**



Source: Factset, MSCI, S&P, Russell (data as of 3/25/21)

other geographies. The discrepancy between Large Cap US and Europe/Japan is even more pronounced when adjusted for the dominance of Tesla (currently ~75% of the US Autos segment).

We have recently increased our exposure to the cyclical and structural trends within Automotive markets via a couple of Japanese component makers – Denso and Koito. Both are Toyota-affiliated entities, but their respective attractions go beyond familial ties and we believe that recent commercial moves within the cross-holding structure (Keiretsu) will prove to be more of a future help than it has been a historic hindrance. Both companies are technological leaders within their fields – electrification power/control systems and LED lighting respectively – with long-standing advantages in terms of intellectual property, R&D spend and scale. Content per vehicle trends for next generation products offer favorable mix effects, while energy efficiency and regulatory dynamics are helping to mitigate downward pricing pressure while their addressable markets grow across new platforms and geographies. Being relevant in the Chinese market can be an important differentiator. At 24 million vehicles, it is already the largest market by volume globally. The government, like many others, has ambitions to radically increase the mix of electric vehicles from 6% last year to 40% by 2030. However, in the interim, the underlying market itself will continue to expand by

>30% (or 8 million units) through 2025, with hybrid powertrains and systems being required to solve the growth and migration requirements.

Traditionally, Tier I component suppliers generally found it difficult to sustainably earn higher margins than their key customers (mid to high single digit operating margins), however, many newer products – de facto technology enablers with higher electronic and/or sensor content – should be capable of generating double digit margins into maturity.

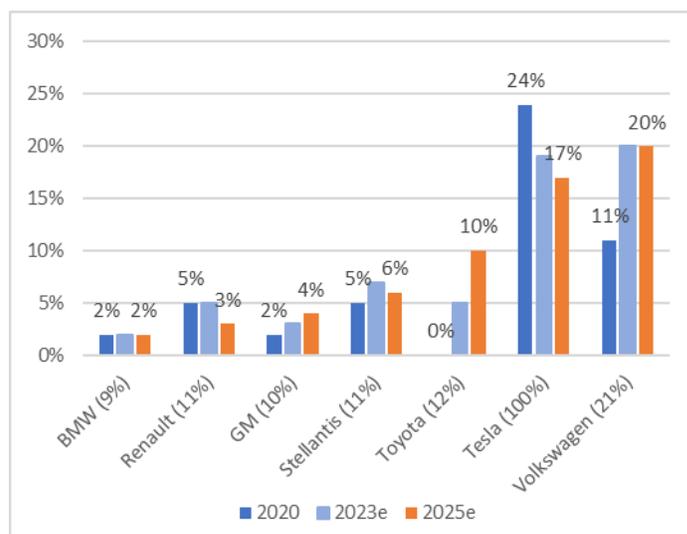
If that is the case, then associated valuation multiples could undergo a structural re-rating. We think such a scenario is consistent with and underpinned by two observations. Firstly, equity investors have been quick to reward companies such as electric motor specialist Nidec – a similar innovative Japanese provider of integrated e-axle systems for electric vehicles, that has no overhang of legacy gasoline engine products. Likewise, power semiconductors have increasingly become a key component for EVs – with recent demand-driven shortages of chips in the supply chain generating investor attention. The likes of Infineon and Mitsubishi Electric have longstanding expertise and scale in this field.

Second, and perhaps more importantly, major car manufacturers themselves are projected to see operating margins from their newer battery electric models match those of traditional vehicles from as early as 2023. The financial payoffs from electrification are still in the future but will, in all probability, start to accrue in this economic cycle.

Of course, the aggregate scale of capital investment required is daunting and the operational risks associated with ramping electric vehicle production and reducing battery costs are non-negligible. Over the next five years, Volkswagen has committed to €35bn in R&D and capex to growing battery electric vehicle capabilities (not including parallel expenditures on software and hybrids), which is on par with Tesla. General Motors and Mercedes are also loosening their purse strings to the tune of approximately €20bn each. Ultimately, we prefer to invest in companies that should benefit from these overall investment and technology penetration trends while remaining well diversified across makes and brands.

Exhibit 2 shows a forecast of how market shares for pure battery-powered passenger vehicles could evolve between now and 2025. By that time, the slices of the rapidly expanding pie are likely to

EXHIBIT 2: BATTERY ELECTRIC VEHICLES—GLOBAL MARKET SHARE 2020-2025



Source: Redburn estimates

change more dramatically for some well-known manufacturers than others, but the scenarios are fluid. As can be seen on the axis labels, the sales mix ratio of battery EVs on this horizon will still be only around 10% for most producers (except Tesla). Both Denso and Koito should benefit from Toyota’s shift in focus away from hybrid leadership toward fuel cells and solid-state batteries while also gaining new business with European and US customers.

With the automotive industry in the throes of transformation, the need to assess near-term risks against longer-term, asymmetric opportunities is pivotal. To re-color Henry Ford’s famous Model T quote, the technological imperative of the coming decade can be summarized as “Any color...so long as it’s green.” From a financial perspective, keeping the necessary investment phase out of the red is equally as important.

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