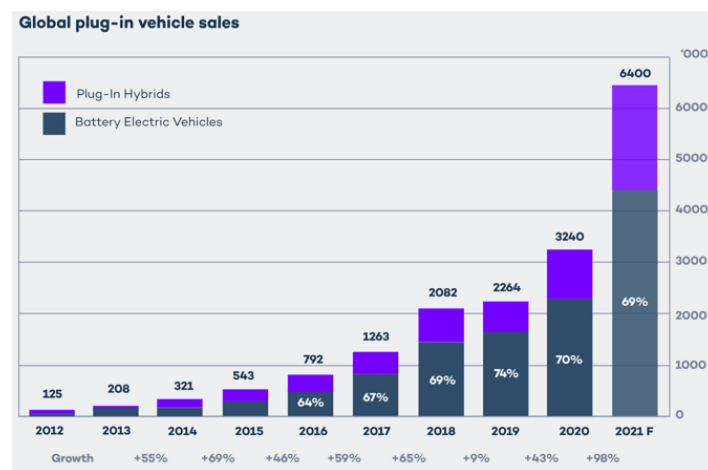


Electric Vehicles: Traditional Automotive Giants vs Disruptive Tech Companies

Introduction

The global electric vehicle (EV) market is experiencing an unprecedented growth spurt, and all signs point to it accelerating further in the near future. Reasons for this are government initiatives in the world's leading economies to support sales of EVs by reducing selling prices through means of subsidies, lowering registration fees and introducing free charging at charging stations. Such policies were implemented in order to meet strict vehicle emission goals. For instance, the EU has issued a regulation to reduce CO2 emissions by 15% before 2025. Another factor contributing to the growth of this market are advances in emerging technologies, which have led to decreases in battery prices, amongst others.

Due to these developments EV sales rose by 43% YOY in 2020 and by (an expected) 98% YOY in 2021. The largest increase is recorded in China, closely followed by Europe.



Global plug-in vehicle sales - Source; EV-volumes

Disruptors vs Incumbents

The inevitability of the arrival of EVs is obvious. Who will be able to dominate this new market in the end is much less so. At present, traditional car manufacturers that have perfected their business models and value chains for decades are competing for control with new, disruptive tech companies. The approaches of these two kinds of companies are vastly different and which companies will ultimately be successful remains to be seen.

Disruptors

Disruptors in the automotive industry are fast growing technology companies focusing solely on the production of EVs. While possessing great technology and innovation skills, they often lack the necessary manufacturing capacity and supply chains to successfully break into this new market. What is more, frequently they still need to establish effective structures for supplier management.

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The most prominent company in this category is Tesla, which is also the current market leader in the EV sector. It sold nearly 500,000 cars in 2020, 80,000 more than its closest competitor Volkswagen. It enjoys a market cap of \$1.06tn and trades at 157 times EBITDA. The second most successful disruptor (although not the second most successful EV manufacturer) is Shenzhen based firm BYD. Mainly active in China, this company has sold 133,000 vehicles in 2020. It has a market cap of \$833bn and trades at 122 times EBITDA. Another notable EV manufacturer is Lucid Motors. This company just started delivering cars for the first time in October after a long delay and has a maximum capacity of 90,000 per annum, which is notably lower than its peers in the industry. Nevertheless, its market cap stands at \$66bn.

Although new EV manufacturers entering the market are lacking in manufacturing capacity with respect to traditional manufacturers, they make up for it by their expertise in software and batteries. Tesla and Lucid have invested significantly more into the development of battery storage systems than their counterparts and are therefore able to offer vehicles with longer range. Furthermore, the disruptors are superior in terms of software. Tesla continuously incorporates the user data it gets from its customers in order to provide useful updates on a rolling basis. This is opposed to incumbents where the software mostly stays the same for the entire life of the car.

Finally, disruptors are excelling in selling their products online through their own online shops. This was one of the factors contributing to them getting through the pandemic without experiencing a drop in revenues comparable to that of traditional carmakers who continue to rely mainly on traditional car dealerships.

Incumbents

Traditional automotive manufacturers have long standing experience in vehicle production and supplier management as well as well-established supply chains. They currently face the task of entering the entirely new business of producing EVs while continuing to support their core business of Internal Combustion Engines (ICE). Thus, they will need to balance finding new electronic powertrain partners and procuring EV batteries with fostering business relations with existing partners and suppliers.

Virtually all incumbents have started developing EV solutions, but there have been differences in the intensity, and the success of these approaches. Volkswagen Group has been the most accomplished so far, almost equalling Tesla in market share in 2020 when it comes to BEV (battery electric vehicles) and PHEVs (plug-in electric vehicles). VW Group boasts a 13% market share, while Tesla has one of 16%. This translates to the former selling 420,000 cars. Notwithstanding this proximity to Tesla with regards to sales units, VW has a significantly lower market cap of \$122bn and trades at 4.6 times EBITDA.

Incumbents will have to adapt to new technologies such as electric machines, power electronics and battery storage systems. However, after building up these competences, leading automotive manufacturers will be able to benefit from their existing organizational structure in order to engineer competitive cars. Naturally, this transformation will not be easy as it requires heavy investment. VW for instance plans to invest \$33bn to meet its goal of selling 3 million EVs per year by 2025. This comes at a time where many incumbents are still reeling from the COVID-19 crisis. The pandemic has seen the revenues of the Top-20 incumbent car manufacturers decline by roughly \$100bn. Additionally, due to incumbents trading at multiples of 4 or 5 times EBITDA, they are facing more difficulties in raising the required money than would Tesla, for instance.

EV Manufacturers' valuations

The valuations of EV producers have dominated the news lately. Volvo recently went public at a valuation of \$23bn, the same valuation that the EV start-up Polestar, that Volvo half owns, achieved in its recent SPAC merger. Volvo produced around 650,000 cars in 2020, whilst Polestar only achieved sales of 10,000. Last week, the US firm

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Rivian achieved a \$100bn valuation at its IPO, exceeding the likes of GM and Ford. This valuation is a fourfold increase of its 2020 private market valuation. Tesla, the firm Rivian is chasing, managed to surpass the magical \$1trn market capitalization mark, putting it in the elite company of big-tech profit machines such as Apple and Microsoft. Toyota, the most valuable traditional automaker, barely reaches a market capitalization of \$250bn.

Hence, it is worth discussing whether the high premiums that disruptive EV manufacturers demand over incumbents are justified. To do this, we will firstly compare the valuations of the two types of auto manufacturers based on traditional metrics. We will compare these using the example of Tesla, currently the pure EV producer selling most cars (500,000 in 2020), with Toyota, the overall top producer of cars in 2020 (9.3 million). Tesla's trailing price earnings ratio currently stands at around 397, which is very high compared to Toyota's 10. Hence, Tesla is about 40 times more expensive relative to past earnings than Toyota.

However, as Tesla is a growth company, purely looking at past earnings when considering its valuation relative to Toyota is unfair to Tesla. Thus, we should consider the forward price to earnings ratio, which stands at 147 for Tesla and 10 for Toyota, substantially reducing the valuation difference between the two firms. Still, this valuation of Tesla appears very high. A price to book ratio of around 45 compared with Toyota's ratio of 1 adds to this impression.

Justifications for Valuations

As mentioned above, traditional auto manufacturers and disruptive EV producers are very different, with some of these differences supporting the higher valuations. The latter can focus on building electric vehicles from the offset, whilst incumbents have to wrestle with corporate structures inadequate for adapting to the new EV world: for instance, they struggle to lay off workers and are often cautious of cutting their petrol engine business at a rapid rate. Another advantage is that the start-ups have an easier time hiring top engineers, due to the incentive of stock options in young companies as well as a less hierarchical and rigid management structure. Most importantly, however, some of the new firms have significant technological advantages. One example is Lucid Motors, whose Air model's official range is 520 miles, the highest of any electric vehicle.

On the other hand, the newcomers have less brand power than incumbents, meaning they may be less trusted. Hence, more conservative buyers may choose to stick to the brands they know and have a proven track record of safety, which would imply that sales of Tesla & Co will not rise to the extent that they justify current valuations. In addition, the high valuations assume that there is some first-mover advantage in the EV space, allowing the start-ups to produce more technologically advanced products than incumbents. One argument against this theory would be that Mercedes' new EQS model's range has eclipsed that of the Tesla model S, once seen as the gold standard in terms of EV range, by nearly 50 miles.

Potentially, this comparison of old versus new car manufacturers is flawed in general. This is due to many disruptive EV manufacturers focusing on becoming service providers in the long term, rather than just sellers of cars. The goal is for people not to own cars anymore, but to be driven by self-driving cars from a pool of vehicles provided by the manufacturer. Hence, the firms can profit from the more stable ride fee revenue, rather than the more cyclical selling of cars. If this business model does become a reality in the future, car makers would become software providers to a greater extent than hardware manufacturers. Provided we look at EV start-ups from this software angle, it can be argued that their valuation should be considered as, and thus compared with, technology companies, rather than car makers.

To see whether the comparison between EV producers and technology company valuations yields a different result, we will now compare Tesla with Microsoft, a diversified software provider. Tesla, as mentioned above, has a forward PE of 147, whilst Microsoft's is 37. Thus, there is still a large valuation gap between the two firms. One

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justification for the substantial difference is that Tesla's sales are growing at a 73% CAGR as of September 2021, whilst Microsoft is only growing at 10%.

Thus, we should compare the valuation of Tesla with Etsy, one of the fastest growing profitable technology firms with a revenue CAGR of 59%. Its PE ratio is 70. Therefore, if looking at Tesla from the viewpoint of a fast-growing technology firm, its valuation is still high, but far less so than when comparing it with other companies. Arguably, the other EV start-ups are valued even more highly, as many of them are yet to sell cars and are years away from making profits.

However, there exists a scenario in which these valuations will appear justified in hindsight, provided Tesla and other disruptive EV producers' technology advantage persists, and the firms become 'mobility-as-a-service' providers. Still, as of today, it is not clear that the EV start-ups will dominate the mobility of the future, due to the competition that can be expected from incumbents.

EV's Market Reaction

The euphoria surrounding EVs has boiled over from EV vehicle manufacturers to EV charging companies as well. Blink Charging stock surged around 2,000% last year. Similarly, shares of Switchback Energy Acquisition Corporation, an energy sector-focused SPAC, surged 220% in 2020 after it announced a merger with ChargePoint in September.

The volatility of EV stocks tends to be quite high: the implied volatility for Tesla is the highest in the sector (in absolute value), established at \$133.37 compared to \$711.83 12 months average price, while Avis's volatility is \$46.45, a high value compared to the last 12 months average price of \$81.05. The coefficient of variation is 18.74% for Tesla and 57% for Avis, meaning that both stocks have registered continuous price variation and volatility. These price fluctuations demonstrate the instability of investor expectations. A demonstration of panic selling occurred relatively recently: on the 2nd of November, Avis was trading at \$357.17, while one week later, on November 9th, it was trading at \$249.68 with a net variation of -30.09% in a single week.

To understand the reason why this happened, it is necessary to look just before, to the 1st of November. This is the date when the company announced Q3 results that were well above expectations. As a result, there was a massive increase in trading volume and an unprecedented surge in stock price. Pre-earnings consensus estimate EPS of \$6.68 looked very conservative against the \$10.74 delivered. Reported revenues of \$3bn surpassed expectations by \$224mn. The popularity of Avis stock surged on the main Reddit forums on November 2nd, after the stock tripled in price. However, after 2 days the stock price dropped 23.1%. The rental car company has been a target of short-sellers for many months, in great part due to massive pandemic headwinds.

In the case of EVs, the DCF analysis for these companies is very uncertain. While the WACC may be derived following the current market conditions, the future Free-Cash-Flows cannot be determined with a fair degree of certainty. The basic criterion for retail investors is common sense. Few have founded opinions on EV's future, so there might be speculation over expectations. Many times, in the history of the stock market, speculation has led to the financial instability of the whole market. One measure often used by economists to predict a potential asset price bubble is the cyclically adjusted price-to-earnings ratio, developed by economist Robert Shiller. The measure looks at firms' inflation-adjusted real earnings per share over 10 years to indicate possible over-or under-valuations. But as the famous economist Eugene Fama stated "you can't spot a bubble, so don't even try": in this case, the quote may be eligible for consideration given the brilliant (and uncertain) future possibilities of the sector.

Hertz represents another example of EV price speculation in the stock market. On May 23rd, 2021: Hertz declared bankruptcy. "The impact of Covid-19 on travel demand was sudden and dramatic, causing an abrupt decline in the

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company's revenue and future bookings,” Hertz’s executives said. In November 2021, Hertz raised \$1.3bn in ‘Re-IPO’, following the restructuring of the firm. The relationships established with Tesla and Uber attracted the attention of lots of retail and institutional investors: Hertz announced in late October it had ordered 100,000 Tesla Model 3s, expected to be delivered late in 2022. The company is expected to rent out 50,000 of these cars to Uber to support its network. Hertz’s case, a bankrupt company that may be revitalized by funds raised through “Re-IPO”, could be interpreted by a stock market theory: Reflexivity theory.

The reflexivity theory states that investors don't base their decisions on reality, but rather on their perceptions of reality instead. The actions that result from these perceptions have an impact on reality, or fundamentals, which then affects investors' perceptions and thus prices. Expectations of Hertz’s future in the EV sector lead investors to fund the IPO, giving the company the chance to realize its projects: an example of “self-fulfilling prophecy”. The role played by Behavioral Finance in the EV sector is critical and the future success of some businesses may depend on the ability to raise investors’ expectations on future scenarios.

ESG Funds

The EV sector is part of a bigger trend in the industry: ESG-related companies.

ESG or Environment, Social, and Governance parameters are used by the new generation of investors for judging companies and choosing where to put their money. Today’s investors prefer to invest in companies that act responsibly towards the environment and the community in which they function while ensuring ethical governance within their corporate structures.

Data from the global fund-flow tracker, EPFR, revealed that equity funds that offered SRI or ESG investing registered inflows of \$168.74bn in 2020, a big jump from the \$63.35bn seen in 2019. A BlackRock survey in December 2020, conducted on more than 400 investors across 27 countries representing an estimated \$25trn in AUM, revealed that investors plan to double their ESG investments over the next five years. This would take the ESG AUM from 18% in 2020 to 37% by 2025.

It is necessary to emphasize that the inclusion in ESG index funds can boost demand and liquidity in the company's stock. The inclusion in these ESG indexes developed by different intermediaries brings liquidity from institutional and retail investors: the public attention to the environmental problems may also be another booster for EV companies that need sources of financing for their projects.

TAGS: Electric Vehicles, Valuations, Tesla, General Motors, Ford, Lucid Motors, Polestar, Emissions, Technology, Rivian

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