

Tesla Motors and the U.S. Automotive Industry

The Big Three – GM, Ford, and Chrysler – ruled the U.S. car market for most of the 20th century. Protected by high entry barriers, highly profitable GM had over half of the U.S. market to itself. Ford and Chrysler both did well too. Then, in the 1960s and 1970s, foreign carmakers entered the U.S. market, at first mainly by importing vehicles from overseas plants. Foreign makes included the German brands Volkswagen (also owner of the Porsche and Audi brands), Daimler, and BMW, and the Japanese brands Toyota, Honda, and Nissan. By the 1980s, these foreign entrants had intensified competition and threatened the Big Three's market share, such that the U.S. Congress passed significant import restrictions. Not to be stopped, the new players responded by building U.S. plants to comply with the new rules. More recently, Korean carmakers Hyundai and Kia have begun making and selling cars in the United States.

Although globalization paved the way for significant new entry into the U.S. auto market, the worldwide car manufacturing industry has seen few new entrants. In fact, no new major car manufacturers have emerged in the past couple of decades simply because few industrial products, save for jet airplanes and nuclear power plants, are as complex to build as traditional cars powered by internal combustion engines. Large-scale production is necessary for car manufacturers to be cost-competitive. Taken together, these factors create significant entry barriers into the car manufacturing industry. Would you say, then, that a Silicon Valley technology startup, attempting to break into this industry, might be running a fool's errand?

Enter serial entrepreneur Elon Musk, who creates and runs new ventures to address not only economic but also social and environmental challenges. Musk looms large in the public imagination and has even been likened to the fictional Tony Stark, aka the Iron Man, Marvel Comics' eccentric inventor. Indeed, Musk made a cameo appearance in Iron Man 2. During the Internet boom, Musk made his fortune by developing an early version of Google maps and by co-founding the online payment system PayPal. The sale of both companies amounted to close to \$2 billion, and Musk's share allowed him to focus on his lifelong passions in science, engineering, and space.

His most recent companies include SpaceX, the first private company to deliver a cargo payload to the International Space Station; Solar City, basically the Walmart of solar panel installations; and, of course, Tesla Motors. Currently, Tesla receives most of Musk's attention.

Faced with the formidable entry barrier of large-scale production, Tesla sidesteps the hurdle by producing all-electric cars. Compared to complex gasoline engines, electric power trains use relatively simple motors and gearboxes with few parts. The Tesla Roadster, a \$110,000 sports coupe with faster acceleration than a Porsche 911 GT, served as a prototype to demonstrate that electric vehicles can be more than mere golf carts.

After selling some 2,500 Roadsters, Tesla discontinued its production to focus on its next car: the Model S, a four-door family sedan, with a base price of \$71,000 before tax credits. The line appeals to a larger market and thus allows for larger production runs to drive down unit costs. The Model S received an outstanding market reception. It was awarded not only the 2013 Motor Trend Car of the Year, but also received the highest score of any car ever tested by Consumer Reports (99/100). Tesla manufactures the Model S in the Fremont, California, factory that it purchased from Toyota. By 2015, it had sold some 60,000 of the Model S worldwide. Tesla is also working on a newly designed seven-seat electric vehicle – the Model X – in an attempt to combine the best features of an SUV with the benefits of a minivan; the first deliveries are scheduled for 2016. The third model in Tesla's lineup is a smaller vehicle that will cost around \$35,000 and has a range of 200 miles per battery charge. The Model 3 is slated to go on sale in 2017.

Although Tesla Motors has successfully entered the U.S. automotive market using innovative new technology, its continued success will depend on other firm and industry factors. While industry forces

have been favorable for a long time in the U.S. automotive industry, recent dynamics have lowered the profit potential of competing in this industry and thus reduced its attractiveness. Now that Tesla Motors has demonstrated how new technology can be used to circumvent entry barriers, other new ventures may soon follow. These are also nontraditional competitors entering the electric vehicle market. Google, for example, has been working on a self-driving car, unveiling a prototype in 2015. Apple is also investing in an electric car under the code name "Titan". None of these has the performance of a Tesla, but both are firms with established brands and credibility and significant financial resources. In addition, the old-line car companies are also adopting the new technology by introducing hybrid or all-electric cars, further increasing rivalry in the industry. The Nissan Leaf, with a sticker price of about \$30,000 before tax incentives, is the world's best-selling all-electric vehicle worldwide, with more than 200,000 vehicles sold.

One of the biggest PEST factors impacting the all-electric car market, however, is that the prices for crude oil declined steeply from over \$110 per barrel in the summer of 2014 to about \$40 by spring 2015. With it, prices for a gallon of regular gas in the United States fell from over \$4 in the summer of 2008 to less than \$2 by 2015. With low gas prices, Americans prefer to buy large SUVs and trucks, which benefits GM, Ford, and Chrysler. In addition, several states are reducing or phasing out tax credits for alternative-fuel vehicles.

Another external industry force that Tesla Motors currently addresses is the bargaining power of suppliers. Lithium-ion battery packs are not only in short supply but also the single most-expensive component for Tesla's electric engines. These critical inputs are supplied by only a few technology firms, including Panasonic in Japan. Given that these sources are few, the bargaining power of suppliers in the electric car segment is quite high, further limiting the industry's profit potential. To mitigate the strong bargaining power of key suppliers, however, Tesla has committed to building a 980-acre facility near Reno, Nevada, to produce its own lithium-ion batteries to supply its automobile assembly plant in Fremont, California. The new battery plant is slated to begin production in 2017 and requires a \$5 billion investment to place the plant near sources of lithium and power it with renewable energy. Questions remain whether lithium-ion batteries will be able to provide the needed performance for battery life and recharging time, or whether a new technology will emerge, making this a large gamble.

Tesla Motors completed its IPO on June 29, 2010, the first IPO by an American automaker since Ford in 1956. On the first day of trading, Tesla's shares closed at \$23.89 and generated \$226.1 million for the company. By fall 2014, Tesla's stock had risen to over \$285 per share before starting to slide below \$200 in spring 2015. Nonetheless, Tesla's market capitalization is almost one-half that of GM, although Tesla revenues were a little over \$3 billion in 2014, while GM's were \$155 billion.

Questions:

1. Which PEST factors are the most salient for the electric vehicle segment of the car industry? Do you see a future for electric vehicles in the United States, in the Europe and in China?
2. Looking at Porter's five forces of competition, how would you assess the profit potential of the U.S. car industry?
3. Using the five forces model, what implications can we derive for how Tesla Motors should compete in the U.S. car industry? What would be your top three recommendations for Elon Musk? Support your arguments.
4. Why do you think that Tesla's market capitalization (share price x number of outstanding shares) is roughly 50 percent that of GM, while GM's revenues are more than 50 times larger than that of Tesla Motors?