

Strategic trade-offs in automobile design affect market-share value

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Car companies can either "design for satisfaction" by investing in function and ergonomics or "design for delight" by investing in form, says new research from Raj Echambadi, a professor of business administration at Illinois. Credit: Photo by University of Illinois College of Business

A new study of the interplay between function, form and ergonomics

reveals an important strategic design trade-off for automotive manufacturers: Investments in both function and ergonomics result in higher market share, whereas investments in both function and form impose a share penalty.

Car companies can either "design for satisfaction" by investing in function and [ergonomics](#) or "design for delight" by investing in form, said Raj Echambadi, a professor of business administration at Illinois and co-author of the new research.

The paper, which will be published by the *Journal of Marketing*, also finds that older vehicles with [higher levels](#) of form design hold their market-share value better than older vehicles with higher levels of functional or ergonomic design.

The reason? According to Echambadi, form is conspicuous and universal while functionality and ergonomics are intrinsically personal.

Form broadly equates with a vehicle's "cool factor": the aesthetics of a Corvette, for example, or the unique teardrop shape of a Harley Davidson's gas tank. Function and ergonomics are about performance and comfort: how well the product performs, how smooth the ride is, and how the product-user interface looks and feels to the driver.

"What is comfortable for you might not be comfortable for me," said Echambadi, also the James F. Towey Faculty Fellow at Illinois. "Anyone can produce a 365-horsepower engine. But when you talk about the unique form design of a Lexus RX 350 or a Chrysler 300 - well, that's much more difficult to imitate."

Drawing from diverse disciplines such as marketing, industrial design and engineering, the researchers examined the interplay among three distinct product-level dimensions - form, function and ergonomics - and

their impact on the market share of a product using repeated cross-sectional data obtained from several different sources in the U.S. light-vehicle industry.

Because older vehicles with higher form design hold their market share better than older vehicles with higher functional or ergonomic designs, "firms that focus on functionality and ergonomics need to introduce next-generation products more frequently than firms focused on form, who can afford to wait longer," said Echambadi, also the senior associate dean of MBA programs and strategic innovation at the College of Business.

"Because the value of form is slightly higher and the value decay is slightly less steep, [car companies](#) that focus on form can let their existing design be in order to extract value from the marketplace, and then introduce a new model later," he said. "When you focus on form, it means you don't have to innovate every 24-36 months."

However, if a company overinvests in any of the design factors, it can be counterproductive, Echambadi said.

"Sometimes there are natural trade-offs," he said. "When you focus a lot on performance or comfort, technical constraints begin to emerge and there are inevitably trade-offs with respect to form."

On the flip side, the manufacturer of a vehicle with superior form design may receive a market share penalty by also taking functional or ergonomic elements to the extreme, since such a product could be considered "overdesigned" by consumers.

"Amping up the styling and performance is a risk, and what happens is you end up overshooting the market with a costly product, thereby targeting a narrower segment of the market," Echambadi said. "What's

the difference between 370-horsepower engine versus 390-horsepower engine to a customer? Unless you're a car expert, there's no perceptible difference.

"Car companies need to be extremely aware of when they're crossing the line into overkill because there are direct implications on cost to the consumer. If you need to invest, invest in either functionality and ergonomics, or in form - one or the other. This is the strategic capability trade-off."

However, car companies shouldn't create a car with extraordinary functionality but a subpar form design, Echambadi said.

"You'll still need to at least be average in form design to appropriate share growth," he said. "But beyond being average, there are no returns to scale for going above and beyond in the form department."

The average also depends on what segment a company is competing in.

"The average is going to be a lot different for the luxury car market than it will be for the economy car market," Echambadi said. "So a manager needs to understand the segment that they are competing in, in order to assess the average level of design required."

Given the size of this industry, the monetary implications of these interactions is substantial, Echambadi said.

"Shifting [market share](#) up or down by even a tenth of a percentage point in the overall industry represents more than half a billion dollars," he said.

More information: The paper "Designed to Succeed: Dimensions of Product Design and Their Impact on Market Share" is available online:

www.ama.org/publications/Journal...-igned-to-succeed.aspx

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