

Poor understanding of ratios leads to bad shopping decisions, study says

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Consumers make poor purchase decisions when they need to work with ratios to assess a product's value, says a new study published in the May 2017 of the *Journal of Marketing Behavior*, from the University of

Miami School of Business Administration. In situations where consumers must average ratio information, such as comparing the fuel efficiency of two cars using the ratio miles per gallon, they often flub the numbers by incorrectly assuming the mathematic equation to find miles per gallon would be to average the sum of the mileage of both cars and then divide by two, instead of using a more complex equation needed to accurately compare ratios. This incorrect way of crunching the numbers leads to only 25-30 percent of shoppers getting the correct answer.

"People rely heavily on the 'normal' way to compute an average and if they simply had ready access to software that calculates the average of ratios, they could make more informed decisions about many big-ticket purchases, such as cars," said Michael Tsiros, professor of marketing at the University of Miami School of Business Administration. "If you think about how many different ways we miscalculate the average of ratios, you'd realize how much of an impact this likely has on our [stock purchase decisions](#) that can also suffer from the same bias given they can also be compared as ratios," said Tsiros, who conducted the study with a colleague from Texas A&M University.

Methodology

The researchers conducted two studies to demonstrate consumers' difficulty in dealing with ratios. In the first study, participants were assigned word problems that, in order to arrive at the correct answer, required them to use the formula for averaging ratios. The majority, 53 percent of the participants selected the response that reflected the arithmetic average vs. the average of ratios. In the second study, participants received information on the cash flow, discount rate, and growth rate of three stocks and were asked to allocate \$1,000 across them. Similar to the first study, 48 percent of participants' selections reflected the incorrect use of the arithmetic average formula.

"Whether the decision is about allocating funds properly to a 401K plan or finding a washer and dryer that uses a lower ratio of water per load, this study points to the significant need for something like a ratio calculator built on to relevant shopping websites or perhaps in-store," continued Tsiros. "Maybe it's an easy mobile app. Whatever it may be, the return that comes with going the extra mile for your customer, especially those making big-ticket purchases, is a smart business [decision](#)."

Provided by University of Miami

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