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# DO EXPERT REVIEWS REALLY DRIVE DEMAND? EVIDENCE FROM A GERMAN CAR MAGAZINE

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# **Do Expert Reviews Really Drive Demand? Evidence from a German Car Magazine**

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## **Zusammenfassung/ Abstract**

There is a wide range of magazines, newspapers, TV shows, and websites providing information on products based on product reviews or expert opinions. A natural question is, whether these reviews and expert opinions have effects on product sales. There is a small but growing literature in economics and marketing science testing the relevance of such product information, based on products such as financial instruments, wine, books and movies. However, books, movies, and wine have in common that quality is very difficult to measure. It is always also a matter of taste whether these products can be seen as high or low quality goods. Even financial products are sometimes hard to evaluate due to the well-known fact, that financial market data often contains much noise. Based on a unique dataset, we test whether test scores published in a major German car magazine have significant impact on registrations of new cars in Germany. We find that test scores for certain cars have statistically significant impact on the number of new cars sold by several leading manufacturers on the German car market.

**JEL-Klassifikation / JEL-Classification:** L150, L820

**Schlagworte / Keywords:** Car magazines, Test Scores, Demand

Consumers' decisions on purchasing certain products largely depend on technical characteristics and the quality of a product (see Lancaster, 1971). Depending on a product's complexity and its price, the difficulty to gather the relevant information varies to a great degree. Customers might try out new fast moving consumer goods such as soaps or shampoos frequently, but for durable goods as computers, washing machines or cars sampling is much harder. In general, customers try to get much more information before buying expensive goods as cars. However, complex goods as cars are difficult to evaluate, as the diversity of the products' components and its longevity makes it hard to compare the characteristics of several cars which might get into the customer's decision space. To some degree a potential buyer might rely on manufacturer's information which leads firms to spend significant budgets on advertising. Consumers are generally aware of the fact, that all these information is provided by manufacturers to foster their sales. Therefore, it is natural that consumers try to find other sources of information, which can be considered more objective. Magazines, newspapers, and TV shows provide such information for a long time and since the diffusion of internet access went off, the information available to consumers is really hard to quantify.

It is well known that media as car magazines and cinema magazines are sold in large quantities, but the economics and marketing science literature on the effects of expert opinions and test reviews published in such media is rather new and still comparatively small. There is some evidence that expert opinions or reviews in magazines have impact on consumers' buying decisions. In an early study of the effects of film critics on the success of movies Eliashberg and Shugan (1997) show that reviews do not have significant effects on early box office receipts but show significant correlation with late box office receipts. Their conclusion from box office data is that film critics do not influence the success of a movie but are rather good predictors of a movie's success. Later studies come to contrary results. Reinstein and Snyder (2005) show that positive reviews for some genre of movies have significant impact on its success. Sorensen and Rasmussen (2004) find a strong correlation between book reviews in the New York Times and book sales. An interesting feature of their study is that positive as well as negative reviews foster books sales, which they summarize in the phrase "any publicity is good publicity". Clement et al. (2008) show some evidence of a positive impact of ranks in lists of bestselling books on demand for books. However, this information is not a review or a test in the standard sense, but also some sort of information about products other people prefer.

Besides media products there is some literature on the effects of reviews on wine demand. Friberg and Grönqvist (2012) provide evidence that positive reviews of certain wines

have significant positive effects on the demand for these wines in Sweden. Similar evidence is shown in Hilger et al. (2011) taking advantage of a retail experiment and using difference-in-differences techniques for wine demand in California. They find decreasing demand for lower scoring wines and increasing demand for wines with high scores in reviews. Therefore they provide evidence, that reviews indeed have impact on customers' demand. Ashenfelter and Jones (2013) find some effects of expert reviews on wine prices concluding that such reviews have to some extent significant effects on consumers' willingness to pay for products as wine which represent experience goods. Jin and Leslie (2003) use the 1998 introduction of hygiene quality grade cards for restaurants in Los Angeles to test whether this information has significant effects on restaurants' choices of product quality and consumers' decisions which restaurants to visit. They show that scores in restaurant health inspections increased significantly after the introduction of hygiene score cards and consumer demand also became sensitive to the information on these score cards. However, this study differs from the other literature in the way that it utilizes data provided for customers by public agencies which might be more trustworthy to consumers than information provided by profit oriented private entities.

Another strand of the literature deals with financial products. In magazines and newspapers dealing with financial topics, recommendations and evaluations of certain financial instruments have a long tradition. As a result, the literature on recommendations of financial products is significantly larger than on media products and food.<sup>3</sup> Sirri and Tuffano (1996) find evidence for mutual funds gaining higher media attention receiving significantly higher capital inflows. It is also well documented that advertising fosters mutual fund flows (see Jain and Wu, 2000 and Cronquist, 2004). However, Reuter and Zitzewitz (2006) provide some evidence of asymmetric effects of print and non-print advertising on funds flows. As non-print advertising drives funds flows significantly, print advertising does not show any significant effect on funds' inflows. Reuter and Zitzewitz (2006) conclude that firms' returns to print advertising are solely based on biased content due to advertising related media bias in form of funds recommendations in financial magazines. Concluding, there is some evidence, that expert opinions and test scores from newspapers, magazines or other types of media can have significant impact on consumers' demand.

The effects of expert reviews on demand is also interesting, because a growing literature shows that some content in newspapers and magazines is biased towards medias' advertising customers. Studies analyzing advertising related media bias, including theoretical papers by

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<sup>3</sup> Early as in 1929 the American journalist Samuel Crowther published an interview with John J. Raskob, a financial executive at General Motors, with some recommendations how to invest in stocks in the "Ladies' Home Journal" (see Siegel, 2008: 3-4).

Mullainathan & Shleifer (2005), Ellman & Germano (2009), and Gal-Or et al. (2012), show the extent of media bias under different market structures. Empirical studies on media bias and advertising include, e.g., Boykoff & Boykoff (2000) on newspaper coverage of climate change topics or Reuter (2009) on wine reviews, and Reuter & Zitzewitz (2006) on recommendations for investment funds. In a recent paper Dewenter and Heimeshoff (2014) provide evidence of media bias in car reviews of a leading German car magazine towards its advertising customers. The literature on media bias shows that expert opinions and product reviews do not in every case provide accurate information helping consumers to reach rational decisions.

## 2 Data

We collected monthly data on test scores for six major car manufacturers in a leading German car magazine *AutoMotor&Sport* from March 2001 to December 2007.<sup>4</sup> Our information contains data on test scores for reviews of single cars and comparison tests between cars. The following table provides some descriptive statistics of our variables.

Table 1: Descriptive Statistics

Variable	Observations	Mean	Std. Dev.	Min.	Max
New registrations per manufacturer	492	21,229.73	9820.62	5,519	49,210
Points per month per manufacturer	368	31.06	30.74	0	171
Number of tests per manufacturer	368	3.23	3.10	0	18
Average points per test per manufacturer	367	11.37	3.53	0	17
Ifo index of business climate	492	8612.65	3585.55	92	11,309

As *AutoMotor&Sport* is a biweekly magazine, we aggregated the points scored in car reviews on a monthly basis for every manufacturer. The main reason is the monthly publication of car registrations by the *German Central Office of Motor Vehicles* (Kraftfahrzeugbundesamt). Furthermore, the number of reviews per manufacturer per month differs significantly. To cope with this problem, we calculated the average number of points per test for each manufacturer for single tests and comparisons. Additionally, we include the *ifo business cycle indicator*, which is published on a monthly basis by one of Germany's leading economic research insti-

<sup>4</sup> These manufacturers are Audi, BMW, Mercedes Benz, Opel, Toyota, and Volkswagen.

tutes. This variable controls for variations in new car registrations due to general business cycle fluctuations.

### 3 Specification and Results

We present our results for different specifications to explain the effects of test scores on new car registrations in the following table. We estimate static models as well as dynamic models by OLS. Additionally, we estimate a panel fixed effects model with AR(1)-disturbances suggested by Baltagi and Wu (1999) to account for possible autocorrelation in residuals. Dynamic models are better suited to cope with persistence of new car registrations over time (see Wooldridge, 2010: 271-373 on dynamic models). The ifo index controls for general economic conditions, which might influence consumers' decisions to purchase cars. We also include dummy variables for months and years to control for seasonalities and trends. Seasonalities or fluctuations based on advertising campaigns (also referred to as "pulsing campaigns") might have significant effects on new car registrations (see Feinberg, 1992). These effects are captured by monthly dummy variables in our regressions.

Table 2: Estimation Results

New Registrations	Static OLS	Dynamic OLS	Dynamic AR(1)-Disturbances
New Registrations <sub>t-1</sub>	-	0.349 (0.061)***	0.914 (0.019)***
Points per Test	0.037 (0.020)*	0.039 (0.019)***	0.056 (0.021)***
Ifo index	0.011 (0.010)**	0.010 (0.004)*	0.009 (0.005)
Manufacturer Dummies/FE	YES	YES	FE
Month Dummies	YES	YES	YES
Year Dummies	YES	YES	YES
Cons.	9.011***	6.495***	0.348**
Obs.	365	361	355
R <sup>2</sup>	0.91	0.92	0.91

Heteroscedasticity consistent standard errors on parenthesis. \*, \*\*, \*\*\*: Statistically significant on the 10, 5, and 1% level.

We find statistically significant effects of test scores on new car registrations, which hold in all specifications. Furthermore, the size of the effect is rather consistent over our speci-

fications. A one percent increase in test scores leads to a 0.04 to 0.06 percent increase in new car registrations. Related to a mean in new car registrations in our dataset of 21,230, this is a significant number. However, compared to the overall number of new registrations for certain manufacturers the numbers are still small, but still it seems that test reviews have a significant impact on new car registrations.

#### **4 Conclusion**

Customers seek advice for purchasing durable goods in newspapers, magazines, TV shows, and websites. The economics and marketing literature testing whether these expert reviews and tests really effect consumers' decisions is still new and comparatively small. A large portion of the literature is based in media products as books and movies, food products as wine or financial products. All these goods have in common that their characteristics are hard to measure and their judgement is very subjective. We show that test scores in a leading German car magazine have significant impact on new car registrations. A one percentage increase in test scores leads to a 0.04 to 0.06 percentage increase in new car registrations. As a result, consumers reading car magazines really use information from the magazine for their decisions to buy new cars. The major advantage of our empirical study is using cars as an example, because it is much easier to measure the characteristics of cars than that of other products used in the literature.



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