

# DISCUSSION PAPER

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## Media Coverage and Car Manufacturers' Sales

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# Media Coverage and Car Manufacturers' Sales

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March 2016

## Abstract

A wide range of media provide information on many products based on reviews or expert opinions. The effects of such information on product sales is analyzed in a small but growing literature in economics and marketing science. However, there is much more coverage on companies and products in the media than product reviews and expert opinions. Based on a unique dataset, we test whether coverage of car manufacturers in opinion leading media have significant impact on registrations of new cars in Germany. We find that positive (or at least neutral) media coverage has statistically significant effect on the number of new cars sold by several leading manufacturers on the German car market.

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## 1 Introduction

Consumers' purchasing decisions largely depend on information provided by the media. On one hand media coverage has a significant impact on the consumer confidence in general (see, Alsem et al, 2008, or Kholodilin et al, 2015). On the other hand such information can be product related as online reviews of books and movies or reviews in car magazines or expert opinions on wines or restaurants (see, e.g., Dewenter and Heimeshoff, 2016, Reuter, 2009, or Zhu and Zhang, 2010). However, not each report in the media related to certain companies is also related to products' characteristics, qualities or prices. Especially in the news media there is very often general coverage on companies, not focused on single products but on, e.g., general strategies, management, finance or environmental, social or governmental activities of the enterprise. A recent example is the much debated scandal of German car manufacturer Volkswagen manipulating emissions of its Diesel engines on test runs. Some of the reporting related to this scandal deals with certain products, engines as well as cars, produced by Volkswagen.

The literature provides some evidence that product related coverage, for example expert opinions or reviews in magazines, may or may not have impact on consumers' buying decisions (see e.g. Eliashberg and Shugan, 1997; Reinstein and Snyder, 2005; Sorensen and Rasmussen, 2004; and Clement et al., 2008). A different strand of the literature analyzes the effects of reviews on wine demand (see Friberg and Grönqvist, 2012; Hilger et al., 2011; Ashenfelter and Jones, 2013). 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 (see Sirri and Tuffano, 1996; Jain and Wu, 2000; Cronquist, 2004; and Reuter and Zitzewitz, 2006).

The research question of this paper is to what extend general information influences consumers' purchasing decisions as well. Testing the effects of general media reporting on firms and prices is relatively rare. One exception is the long tradition in financial economics of testing the effects of news on prices in financial markets. These tests are regularly implemented as event studies (see MacKinlay, 1997) dealing, for example, with the effects of merger announcements on asset prices. But also in political science the effects of media coverage, for example on elections, are studied extensively (see, e.g., Lawson and McCann, 2005).

Our paper intends to fill this research gap and for this reason, we analyze the impact of media coverage in opinion leading newspapers and television channels in Germany on new cars' registrations using panel data techniques by regressing the manufacturers' numbers of new registrations on measures of media coverage, which is classified as positive, negative, and neutral, as well as on some controls. The following section describes our dataset. Section 3 reports the results from our statistical analysis and section 4 concludes.

## 2 Data

We utilize a unique dataset including media coverage in German opinion leading media from Media Tenor International. In general swiss-based Media Tenor International analyzes a broad range of international opinion-leading media, including TV news programs, newspaper, magazines, business media, radio as well as social media with regard to all possible protagonists, such as persons (politicians, entrepreneurs, managers, celebrities, etc.) and institutions (political parties, companies, football clubs, etc.). Each of these news items is analyzed for instance with regard to the topic mentioned (foreign policy, HR, unemployment, business strategy, etc.) as well as with regard to the tone of the information (negative, positive or neutral).

For the analysis provided here we did concentrate on media coverage in German opinion leading media, inclusive seven TV newscasts, seven newspapers, and five weeklies and two business media (see the appendix for a detailed list), on 37 car manufacturers<sup>4</sup> from March 2001 to October 2011 (see Table 1 for descriptive statistics). Here, the tone of the information reflects if a manufacturer is mentioned in positive, neutral or negative way.

To approximate monthly car sales, we used data on new car registrations provided by the *German Federal Office of Motor Vehicles* (Kraftfahrzeugbundesamt). Additionally, to account for variations in new car registrations due to general business cycle fluctuations, we include the ifo business cycle indicator, which is published on a monthly basis by one of Germany's leading economics research institutes.

**Table 1:** Descriptive Statistics

	Mean	Std. Dev.	Min	Max
Registrations	7413.92	26812.29	0	857112
ifo	101.36	8.04	84.50	115
Reports	23.67	122.94	0	6887
Positive	5.13	19.18	0	916
Neutral	13.60	70.20	0	3883
Negative	4.94	36.86	0	2088

## 3 Results

To analyze the impact of media coverage on new car registrations we run simple fixed effects panel regressions as well as dynamic fixed effects models (see Wooldridge, 2010). We estimate dynamic models using simple fixed effects regressions. As the time dimension of our

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<sup>4</sup> That is Alfa Romeo, Audi, BMW, Chevrolet, Chrysler, Citroen, Daihatsu, Ferrari, Fiat, Ford, Honda, Hyundai, Jaguar, Jeep, Kia, Lancia, Land Rover, Lexus, Maserati, Mazda, Mercedes Benz, Mitsubishi, Nissan, Opel, Peugeot, Porsche, Renault, Rover, Saab, Seat, Skoda, Smart, Subaru, Suzuki, Toyota, Volvo, VW.

panel is relatively large, we do not expect a significant Nickell bias when using fixed effects regression with a lagged dependent variable (see Pesaran, 2015).

As presented in Table 2, dynamic fixed effects models (FE II and FE IV) provide some evidence for a significant impact of general information on sales. Using all reports (positive, neutral and negative) as an explanatory variable, a positive and statistically significant impact on registrations can be found (FE II). Each report increases the number of new registrations by about 1.2 cars, which is quite a significant number. Using positive and neutral reports on car manufacturers instead of all reports leads to very similar results (FE IV). An additional report increases the number of registrations by about 1.6. This result seems natural as good news on manufacturers' are more likely to attract consumers to buy their products than bad news. In both regressions the model fits the data quite well.

**Table 2: Fixed Effects Regressions**

	<b>FE I</b>	<b>FE II</b>	<b>FE III</b>	<b>FE IV</b>
	<b>Reg</b>	<b>Reg</b>	<b>Reg</b>	<b>Reg</b>
Registrations <sub>t-1</sub>	-	.9460*** (0.00)	-	.9460*** (0.00)
Reports <sub>t</sub>	4.88 (0.51)	1.22 (0.00)	-	-
Postive+Neutral <sub>t</sub>	-	-	6.59 (0.19)	1.57*** (0.00)
Ifo <sub>t</sub>	-136.63 (0.34)	-20.14 (0.28)	-136.33 (0.34)	-20.08 (0.28)
Time dummies	Yes	YES	Yes	Yes
Constant	20434.53 (0.16)	1706.59 (0.30)	20395.03 (0.16)	1698.94 (0.30)
R2 (within)	0.01	0.68	0.01	0.44
F-Test	3.96 (0.00)	1299 (0.00)	3.88 (0.00)	1670 (0.00)
# of Obs	4,666	4,629	4,666	4,629
# of Groups	37	37	37	37

Note: Heteroscedasticity consistent clustered standard errors are given in parentheses. \*\*\*, \*\*, \* representing 1, 5, and 10% levels of confidence.

Our results are in line with recent news reports on sales drops related to the Volkswagen scandal. After manipulations of emissions tests were broadly covered in the U.K. media, Volkswagen sales in the U.K. dropped by 20 % in November 2015.<sup>5</sup> These anecdotal evidence shows that consumers react to general, non-product specific, media coverage on companies. Many cars produced by Volkswagen, for example all cars equipped with petrol engines, are not affected by the manipulation of Diesel engines. However, customers buying decisions are nevertheless affected by these news, whether indirectly relevant or even relevant.<sup>6</sup>

#### **4 Conclusions**

Consumers typically base their decisions on information about prices and other product characteristics. Media outlets, either in terms of advertising or as editorial content, usually provide such information. However, not every report in the media also contains information on products. Especially in the news media there is rather a general coverage of companies, focusing on general strategies, management, finance or environmental, social or governmental activities of enterprises. In order to analyze the impact of general news on consumer behavior, we run dynamic fixed effects regressions to determine the impact of media coverage on new cars' registrations. Overall, we find a positive and significant number of sales influenced by the news. An additional report per month leads to about 1.2 more registrations. In case that reports have a positive (or at least neutral) tonality, the effect is even higher. Not only product specific information but also general news therefore have a rather strong impact on consumer behavior.

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<sup>5</sup> An analysis of 5.332 reports on automotive companies in TV-newsshows from Germany, Spain, Switzerland, UK and US (January 2012 – November 2015) provided by Media Tenor shows that in contrast to the US the UK media coverage on the VW-Dieselpgate massively exceeded the awareness threshold. After this, the VW-sales in the UK dropped massively (<http://www.theguardian.com/business/2015/dec/04/vw-sales-drop-uk-new-car-registrations>).

<sup>6</sup> The effects of irrelevant information on decision making is studied extensively in economics and psychology. See, e.g., Kahneman and Tversky (1974).

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## Appendix

**Table A: Media Outlets**

TV	Newspaper	Weeklies	Business media
ARD Tagesschau	Bild-Zeitung	Focus	ManagerMagazin
ARD Tagesthemen	Frankfurter Allgemeine Zeitung (FAZ)	Frankfurter Allgemeine Sonntagszeitung (FAS)	Wirtschaftswoch
Pro 7 Nachrichten	Frankfurter Rundschau	Spiegel	
RTL AKTUELL	Rheinischer Merkur	Stern	
SAT.1 18:30	Süddeutsche Zeitung	Welt am Sonntag	
ZDF heute	Taz		
ZDF heute journal	Welt		

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