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Media Bias in Women´s Magazines: Do Advertisements Influence Editorial Contents?

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Abstract: Existing theoretical and empirical studies on Media Bias are subjects of controversial discussions in the literature. However, scientific literatures on Media Bias establish empirical evidence for a positive impact of advertising volume on media coverage. To get in line with the debated literature about whether biases occur, this economic paper presents an empirical analysis of a possible (commercial) Media Bias influenced by advertising expenditure in monthly women's magazines. The results of a linear panel model regression, a panel poisson regression, as well as those of a panel negative binomial regression model show that there is a positive relation with the amount of advertising expenditure on the coverage of a company that purchased advertisements on the women's magazines in Germany. A positive correlation between advertising volume and the nomination as well as prize winning of (cosmetic) products could also be found.

Keywords: Media Bias, Advertisement, two-sided markets, panel poisson regression
JEL Classification: M370, L82

1. Introduction

Media markets represent a prime example of a two-sided market (inter alia Anderson and Gabszewicz (2006), Dewenter (2006)), whereas recipients are offered entertaining and informative content, while advertising customers spent their budget in order to reach a potential high number of recipients. For media companies, especially for print media, advertising is the key and unique source of profits (Dewenter and Heimeshoff (2014), Bralso and Sobbrio (2011)) to remain lucrative. Against this background the question arises whether magazines or newspapers have major incentives in distorting editorial contents for the benefit of its own advertising customers to increase their demand for placing advertisements. While free press in a democratic constitutional state shall preserved unbiased coverage and plurality of opinions, various studies have shown that news reports are on any number of occasions biased in a certain political direction (inter alia Mullainathan and Shleifer (2005); Gentzkow and Shapiro (2006); Chan and Suen (2008); Sobbrio (2011)). This is where the young research field of Media Bias comes into its own. This field is located at the interface of several scientific disciplines and took economists, political scientists as well as media and communication scientists to academic discussions. Nevertheless, most of the various researchers have recently focused their study on Media Bias in the field of political, media and communication science: the relationship between advertisers and recipients, however, is hitherto far less discussed in the literature.

All in all, there are three different theoretical approaches aimed at explaining the existence of biases (Dewenter 2011:12). I) A random and unsystematic distortion of coverage is the least problematic type of Media Bias. In such a case, the distortion can be simply explained by the fact of less precise and incorrect journalistic research work. II) The ideological distortion, however, is done on purpose in order to give a false impression of reality. This kind of distortion may be politically, racially, religiously or socially motivated and is often not-profit oriented (inter alia Mullainathan and Shleifer (2005); Gentzkow and Shapiro (2006 and 2010)). III) The last approach deals with the type of profit oriented Bias, particularly through adaption to the recipient's preferences (inter alia Hamilton (2004); Ellman and Germano (2009)). This type of Media Bias with particular having regard to platforms of a two-sided market (Rochet and Tirole (2003)) is of importance for this paper.

The incentives for distorting coverage are on the one hand with respect to the recipient's preferences or on the other hand to the advertiser's preferences, which may cause an increasing demand on the readers or advertising market. Thus, there is a direct or indirect way of maximizing the revenue on the market for advertising. This is especially problematic when it comes to a strong biased news coverage and consequently to a unilateral coverage and reporting style due to customizing in favor of the advertiser's preferences. In conclusion, distortions lead to an insufficient provision of information, an increase of information costs and therefore to welfare losses (Dewenter (2011)). Furthermore, distorted content in newspapers or magazines appear to be "objective" and therefore the effect of persuasive advertising and the power to convince consumers increases (Gambaro and Puglisi (2015)).

Theoretical studies on Media Bias are ambiguous, arguments for and against Media Biases are discussed in the literature. In conclusion, it is an empirical question is already a focus of research. At this point, I follow the existing discussion and complete the economic literature by an empirical study on Media Bias. Because only a small number of studies have recently concentrated on the effects of advertising expenditure on coverage, especially in the field of entertainment products, this paper deals with the topic of commercial Media Bias. For that reason, I focus on a possible link between advertising expenditure and media coverage in the field of German women´s magazines. Indeed, the market for women's magazines is characterized as a two-sided market, which means, that the market for advertising and the market for recipients are dependent from each other (Bagwell, 2007). This raises the question whether magazines seem to bias their coverage towards their main advertising customers in order to "reward" their advertising costumers. More concretely, I investigate the relationship between the yearly number of mentions of companies in the editorial sections and the yearly amount of advertising that were purchased by these companies on two women´s magazines during the period 2009-2012. Consequently, the interesting research question is: Do the advertising volumes of a company in the selected magazines increase the absolute number of mentions in the coverage of its products? In conclusion, I find a positive significant correlation between the advertising expenditure and the mentions in the magazine's coverage of these companies that purchased their advertisements.

The paper is arranged as follows. Section 2 briefly focuses some earlier studies concentrating on Media Biases and especially the relationship between advertising expenditure and coverage of newspapers or magazines. Section 3 forms the main part, determining backgrounds of the investigated magazines, containing a data description of the panel data model, the econometric estimation and controlling variables. Section 4 and 5 discuss the results of the econometric analysis as well as summarizes and concludes.

2. Literature Survey

Over the past few years, both theoretical and empirical studies have been focusing on the influence of advertising on reporting.

Gal-Or et al. (2010) extend the theoretical study of Mullainathan and Shleifer (2005), dealing with political bias, by analyzing a biased coverage when advertising customers play a substantial role in terms of revenue. Gal-Or et al. (2010) show that (commercial) Media Bias depend on the concept of single- or multihoming of advertising customers. Multihoming and singlehoming means whether a company advertises in more than one newspaper (or only one newspaper or magazine) and therefore chooses to share (or not to share) the advertising budget. Accordingly, if the concept of singlehoming is followed, a tendency of distortion in favor of advertisers can be shown. Gal-Or et al. (2010) cannot find a distortion tendency in case of multihoming. Ellman and Germano (2009) investigate to what extent the market structure effects a commercial media bias in a two-sided market for newspapers. Here, they find that advertising expenditure influences news coverage only in monopolistic newspaper markets. On the contrary, competitive newspaper markets lead to, although the amount of advertisements increases, unbiased news coverage. Blasco and Sobbrio (2011) likewise investigate the relationship between competition and commercial media bias also with regard to the market structure of the advertising customers. They introduce a model by combining the central and important statements of the theoretical literature.

In the end, Blasco and Sobbrio (2011) formulate three central aspects for media regulators that should be considered regarding commercial media bias.

The literatures that are closest to this research paper are the empirical ones on advertising and media coverage by Reuter and Zitzewitz (2006), Reuter (2009), Dewenter and Heimeshoff (2014), Gentzkow, Glaeser and Goldin (2006)), Poitras and Sutter (2009), Rinallo and Basuroy (2009), and Gambaro and Puglisi (2015). Reuter and Zitzewitz (2006) investigate the relationship between advertising expenditure and mutual fund recommendations in financial magazines and financial parts of national newspapers. Through their fixed effects logit model and controlling for characteristics of funds and other observable variables, Reuter and Zitzewitz (2006) find a positive relation between mutual fund recommendation and past advertising expenditures. The latter, however, does not apply to all finance magazines but affects three magazines (Money Magazine, Kiplinger's Personal Finance and Smart Money), who specialize in reporting on personal investing. The national newspapers (Wall Street Journal and New York Times) that are lesser financed by advertisement of mutual funds, show no positive correlation between advertising expenditure and positive mentions in the magazines.

Another well-known study by Reuter (2009) pursues the issue whether there is a correlation between the ratings of wines and advertising expenditure in a wine magazine. He finds weak evidence for biased ratings.

Dewenter and Heimeshoff (2014) deal with the question of up to what extent advertising expenditure of automobile manufactures' impact the test score of the German bi-weekly car magazines Auto, Motor und Sport. Compared to the study of Reuter (2009), which investigates the effects of advertising volumes on occasionally subjective wine ratings in some sense, Dewenter and Heimeshoff (2014) benefit from measuring the products performance in an objective way. Thus, in order to explain the test results, the product performance of a car can be controlled through technical characteristics such as horsepower, mileage, diesel engine, the number of doors or if the car is constructed by a German company. Beyond that, they also collect advertising volumes of the respective car manufacturers to analyze a possible relationship between the advertising expenditure and the performance of the respective cars in the ranking. By using a two-step procedure and accounting for endogeneity and sample selection (probability of a car to be refereed at all) they find a distortion on test scores in favor of advertisers. In most of their cases, they find a selection bias which means that it is more probable to be reviewed when the advertising volume is high.

In addition to this, quite a few authors likewise research commercial Media Bias by concentrating on the US newspaper industry (Gentzkow et al. (2006)), muckraking newspaper (Poitras and Sutter (2009)), fashion firms in magazines and newspapers (Rinallo and Basuroy (2009)) as well as Italian listed companies in daily newspapers (Gambaro and Puglisi (2015)) or the influence of bargaining power of advertisers (Guo and Lai (2014)).

3. Econometric Analyses

3.1 Data Description

This paper investigates the relationship between advertising volume and distorting coverage. Subject matters of the analysis are monthly women's magazines. This is due to several reasons. First of all, the gross advertising expenditure in women's magazines is generally very high. According to Nielsen Media Research, monthly women's magazines spend an amount of 348,5 million Euro in 2012 and an even larger amount of 378,1 million Euro in 2013 for advertising. Thus, the gross advertising expenditure of monthly women's magazines hold the second place out of all consumer magazines in Germany (Nielsen). Furthermore, women's magazines are among the top five of the most popular types of magazines in Germany. Around 35 % of Germans that are older than 14 years read magazines for women (VuMA (2016)).

While advertisements in newspapers are more likely to be regarded as an annoying effect, advertisements in women's magazines are rather perceived as friendly and positive (News Aktuell (2008), Brigitte (2010, 2012)). Kaiser and Song (2009) collected data of different consumer magazines in Germany and show through their logit demand estimation that reader´s even esteem advertisements. Interestingly, advertisements are besides advertisements in TV magazines the most appreciated in women´s magazines.

Additionally, printed advertisings in magazines are usually a very accepted form of advertising because of the special trusting relationship. This can be explained by the fact that consumer magazines can convey the impression of being an expert-magazine in their field, especially in the area of "special interest"-magazines. That is exactly the case of women's magazines. In this way, the selected advertisings enjoy a high credibility right from the start (VDZ, McKinsey (2012)). This special trusting relationship may also be assumed and transferred to the coverage of the printed papers. Furthermore, the frequently discussed crisis about printed media in the field of consumer publications has no apparent impact on the number of existing magazine titles (Jarren (2010), Diez (2009)). On the contrary, the number of published consumer magazines has been increasing from 1,048 to 1,587 titles in Germany within the period from 1997 to 2014 (VDZ (2014)).

For this paper, the highest-circulation and the highest-reach of women's magazine were chosen. Using data from the `Informationsgemeinschaft zur Feststellung der Verbreitung von Werbeträgern e.V.' (short: IVW), the Glamour magazine is the highest-circulation magazine within the time span 2009-2012 (IVW (2014a)). For the purpose of analyzing the highest-reach magazine the data of "Media-Analyse agma Media-Micro-Census" were evaluated. The highest-reach women's magazine within the investigated time period is the Cosmopolitan magazine (Walter (2014)).

In summary, Glamour and Cosmopolitan were chosen within the period from 01/2009 to 12/2012 as monthly women's magazines at national level.

Women´s magazines

The Cosmopolitan is an international monthly magazine for women, which was launched by Schlicht and Field of New York in 1886. Published in Germany since 1980, the Cosmopolitan has a worldwide distribution in around 100 countries and has 64 editions and is published in 35 different languages. In 1886, the magazine was taken over by the Bauer Media Group, previously it belonged to Marquard Media AG. In Germany, the Cosmopolitan is published in a pocket (A5) and a classic (A4) format, the latter was used for this study. Besides the investigated printed versions, the cosmopolitan is also available in digital formats (e.g. website, variety of social media). Of particular noteworthiness is also the annual presentation of the "Prix de Beautés" as a price of special products regarding the market of cosmetic products. The price for particularly innovative products is chosen from around 600 products and is annually awarded by judges of experts consisting of dermatologists, editors and industry representatives. The awarded products in 15 different cosmetic categories are presented within the printed version usually in March. This presentation should be classified not as advertising but rather as editorial content of the magazine.

The Cosmopolitan achieved average ratings of 1,8 million readers per issue (AWA (2014)) and appears 12 times annually in an average print run of 444,023 copies per quarter during the period 2009 to 2012 (IVW (2014a)). The typical cosmopolitan reader is between 20 and 49 years old, employed, and has an above-average household net income (Bauer Media Group (2014)).

Similarly, Glamour is a monthly women's magazine, published by Condé Nast Publications. The first edition, called Glamour of Hollywood, was published in the United States in 1939. Since 2001, the magazine for women is also published in the German-speaking area (Wilhelm-Fischer (2004), Condé Nast Verlag (2014a). The magazine is distributed in 15 international core markets. In Germany, the magazine is exclusively printed in pocket format (DIN A5 format). In addition to the printed editions,

the magazine can be found in various social networks and its own website (Condé Nast Verlag (2014b)). As with the cosmopolitan, only the printed edition is substantial for the investigation.

In this context, of particular interest is an annual awarded cosmetic-prize called "Glammy" (Condé Nast Verlag (2012)) that is selected by the readers from a pool of nominees. In other words, Glamour´s readers are asked to choose their favorite products out of three nominated products from various categories. The three available products were nominated by the editors beforehand. Besides the possibility of voting via internet, the nominated products are presented in each February issue and the winners are presented one month later (Condé Nast Verlag (2012)). A further characteristic of the Glamour is the so called shopping-week, which is organized twice a year with a special offer of discounts. The shopping-week pages are clearly separated from the rest of the magazine's content. Glamour achieved average ratings of 1,56 million readers per issue in 2014 (AWA (2014)) and also appears 12 times a year. The average print run was 660,361 copies per quarter during the period 2009 to 2012 (IVW (2014b)). The target group of the magazine are 33 years old women on average, educated, employed, and with an average household net income of € 3,127 monthly. They are interested in shopping, exploring new trends, and are open-minded (Condé Nast Verlag (2014b)).

All in all, the typical readers of these magazines are very similar to each other and both of the magazines award yearly prizes for the best products.

3.2 Data Collection and Descriptive Statistics

To estimate the influence of companies' advertising volumes on the coverage of its products in women's magazines, data on mentioning of companies in editorial contents of the magazines were collected as well as a proxy for advertising volume. Furthermore, control variables were considered.

Advertising expenditure
At first, all advertisings in all issues from 01/2009 to 12/2012 were counted and summarized for both magazines. Altogether, the following parameters for each advertisement were set: issue, brand, product, sector, sub-sector, advertising size, advertising position, product samples, front/back cover and special format/special paper.

In general, the Cosmopolitan has 197 pages on average, 47 % of the pages are filled with advertisements. The Glamour counts 239 pages on average with advertising content of 48 %.

All in all, a total of 7,580 advertisements were captured, 3,449 advertisements in the Cosmopolitan and 4,131 in the Glamour magazine.
The Cosmopolitan included 1,565 ads in the sector of cosmetic products, followed by the fashion industry with 545 and the media sector with 385 ads during the investigated period. As you can see in figure 1, 45 % of advertisements are due to the cosmetic sector.

The Glamor counted 1,359 ads in the sector of cosmetic, 1,265 of the fashion industry and 281 of the media sector. Figure 2 shows the relative distribution by the different sectors. The largest advertising-sector is the cosmetic industry for both magazines. Therefore, cosmetic products and companies that purchased their advertisements in the field of cosmetic are considered in this study.

To approximately determine the advertising expenditure for the cosmetic sector, 2,924 advertisings were collected for the period of observations in total. Furthermore, 749 different companies purchased these advertisements in both magazines.

In order to measure the advertising expenditure, a proxy variable has to be generated. The advertising volume of each company can be simply calculated. In order to do so, some variables have to be taken into consideration. The first dummy variable for calculating the advertising volume is a variable that

indicates whether the ad was placed before page 41 of the Cosmopolitan magazine or not. This information is important because advertising is more expensive before reaching page 41 (Bauer Media Group (2013)). For Glamour the page number does not make any difference in price calculation.

Because of the different prices of the Cosmopolitan magazine, another two dummy variables have to be taken into consideration. These are a dummy for opening spread and a dummy for the back cover. The variable opening spread is 1, if advertisement is presented on page 2 to 3, otherwise equals 0. The dummy variable back cover equals 1, if advertisement is presented on the outside back cover, otherwise equals 0.

The following variables are also relevant because of their differences in prices. The dummy variables SW describe whether the ad appeared in the part of Glamour "shopping week". Another Dummy CGF is an indication of whether the advertiser has booked two more pages beyond the opening spread pages. The variable IBC stands for the inside back cover. These variables only play a relevant role for calculating the advertising volume for the Glamour magazine, also the "shopping week" variable. The size of the advertisement also plays a relevant role for calculation (e.g. full or half page, besides the content, double page).

The following equation is used for calculation the advertising volume per issue and per company's advertising for cosmopolitan magazine:

$$AV_{icC} = (P_{iC\leq 41} x\, R_{iC\leq 41} + P_{iC>41} x\, R_{iC>41} + P_{iCOS}\, x\, R_{iCOS} + P_{iCBC}\, x\, R_{iCBC}) - D_{iC} \quad (1)$$

AV_{icC} = Advertising volume AV of company c for the issue i of Cosmpolitan C
$P_{ic\leq 41}$ = Number of pages P including page 41
R_{ic} = Advertising rate R
$P_{ic>41}$ = Number of pages P starting on page 42
P_{icOS} = Opening spread OS, advertisement is presented on page 2 to 3
P_{icBC} = Advertisement is presented outside back cover BC
D_{ic} = Discount D, if a company booked a special amount of pages

Similarly, the advertising volume calculation regarding the Glamour magazine, with exception of some variables (e.g. page 1 to 41):

$$AV_{icG} = (P_{ic} x\, R_{ic} + P_{icCGF} x\, R_{iCCGF} + P_{iCOS}\, x\, R_{iCOS} + P_{iCIBC}\, x\, R_{iCIBC} + P_{iCBC}\, x\, R_{iCBC} + P_{iCSW}\, x\, R_{iCSW}) - D_{iC} \quad (2)$$

AV_{icG} = Advertising volume AV of company c for the issue i of Glamour G
P_{ic} = Number of pages P
R_{ic} = Advertising rate R
P_{icCGF} = Advertisement is presented on cover gate fold CGF
P_{icOS} = Opening spread OS
P_{icIBC} = Advertisement is presented inside back cover IBC
P_{icBC} = Advertisement is presented outside back cover BC
P_{icSW} = Advertisement is presented in a shopping week SW issue
D_{ic} = Discount D, if a company booked a special amount of pages

For calculating the advertising volume, the price lists of the year 2013 were used for both magazines. While the advertising prices have continuously increased in total during the time period from 2009 to 2013, the differences between the advertising volumes of several companies were almost unchanged. Therefore, the price list of only one single year can be used without hesitation (Bauer Media Group (2013)).

Mentions

For the purpose of determining the relationship of mentions and advertising volume, all mentions of the cosmetic sector were collected that appeared in the editorial content of both magazines. Consequently, all mentions of companies' products in the editorial part were counted by hand. Again, parameters have been identified regarding the mentions of a product of a certain company, such as issue, page, year, magazine and the products' mentioning in a continuous text or as an image of the coverage.
Altogether, 6,463 mentions were counted. 3,144 mentions of companies' products were counted in the Cosmopolitan and 3.319 in the Glamour magazine within the whole investigated period of time.

Descriptive Statistics

In order to get a first impression on potential biased coverage and the structure of data, I look at the top 10 companies with the highest advertising volumes as well as the products with the most mentions over the entire investigated time period of several companies. The descriptive statistics can be found in the following tables. While tables 1 and 2 show the top 10 companies and concers of Cosmopolitan magazine, tables 3 and 4 illustrates those 10, who were most frequently mentioned and those with the highest advertising volume in the Glamour magazine.

It can be seen that 7 out of 10 companies, that were most frequently mentioned, are in the top 10 of the largest advertising customers in the Cosmopolitan (table 1). The numbers in table 2 show, that the affiliated group Coty (inter alia adidas, Celine Dion, Chloé, Kylie Minogue, Davidoff, Esprit, Jil Sander, Jette Joop) is achieving the ranking number two in spending money for advertising. This is a rather interesting outcome, since none of the brands mentioned in table 1 are part of the Coty Group. Now, the affiliated group Coty is also one of the top 3 concerns mentioned in the Cosmopolitan. As a result, further investigations on affiliated group based rankings should be part of the estimation. It can be seen that 8 out of 10 concerns, that were most frequently mentioned, are in the top 10 of the largest advertising customers in the Cosmopolitan (table 2).

Similarly, in the Glamour magazines are half of the mentioned companies in the top 10 of the largest advertising customers (table 3). Underlying, also in respect of looking at the affiliated group (table 4) in the Glamour magazine, only the affiliated group of Chanel is not one of the top 10 of the largest advertising customers in the Glamour. Chanel achieved the ranking number eight of the most frequently mentioned concerns. All other concerns are also one of the top 10 of the advertisers with the highest advertising volume in total.

The top 10 rankings including both magazines are listed in Tables 5 and 6. Here you can find the total number of mentions and the top 10 of the largest advertising customers (per company and per concern). Of course similarly, mentioned products of companies are often those, who offer a high amount of advertising.

3. 3 Estimation Method

The goal is to explain a biased coverage through the unbalanced panel data set. Therefore, I use three different models calculating per year and per company- and concern-level to check the robustness of the estimations. I do not draw a distinction between the magazines, because they resemble each other. (1) I run a linear panel model regression over time and over company, as well as over concerns. OLS regression panel model is used here because a continuous dependent variable is supposed. In order to model count variables (mentions), I used a (2) panel poisson regression over time and over company, as well as over concerns and a (3) panel negative binomial regression model that is usually used for over-dispersed count outcome variables with the same specifics (Cameron and Trivedi (1998)). All of these three models declaring advertising volumes as an explanatory variable.

I focus on the number of mentions per year within the whole period from 2009-2012. I also focus those companies, that were not mentioned but purchased their advertisements and vice versa. Accordingly, I define $m_{c,t}$ as the dependent variable (3):

$$m_{c,t} = \alpha + \beta AdV_{c,t} + X_{c,t} + \varepsilon_{c,t} \quad (3)$$

where

$m_{c,t}$ = the number of mentions of company c appearing on the women's magazines (Glamour and Cosmopolitan) in year t,

$AdV_{c,t}$ = the corresponding advertising volume (monetary) by company c in year t,

$\varepsilon_{c,t}$ = error term

and $X_{c,t}$ includes corresponding control variables, such as a dummy variable if the product of a company is a brand that's value is of one of the leading ten cosmetic brands worldwide (Millward Brown (2015)), the brand awareness by consumers of several cosmetic companies in % and a dummy variable among the fifteen most popular brands in the cosmetic sector (Brigitte KommunikationsAnalyse (2012)). These explanatory variables are used as a proxy for the "quality" or popularity of a company. Since AdV is a continuous variable, γ can be interpreted. If the advertising volume increases by one unit, $m_{c,t}$ will differ by γ units on average.

All in all, 2,924 advertisings were collected for the period of observations in total with a maximum amount of 455,600 Euro of a company in an issue. Moreover, 749 different companies purchased these advertisements in both magazines and 531 different concerns were collected. In total, companies' products were mentioned 6,463 times within the investigate time period in all issues and 663 valuable brands were counted within the sample. Table 7 provides descriptive statistics for all the variables used in the analysis.

One major factor which concerns objective characteristics of the products needs to be taken into consideration. For instance, Dewenter and Heimeshoff (2014) achieve an objective measurement by including technical characteristics of car performance. Similar approach, unfortunately, cannot be easily used in this research paper by focusing on certain objective characteristics of cosmetic products and controlling for them. Quality is especially relevant for estimating the impact of advertising volume on the yearly awarded beauty products ("Glammy" and "Prix de Beautés") as well as the mentioning of a companies' product. One source for this objective measurement of quality could be consumer ratings on internet platforms such as Ciao and Dooyoo or assessments made by independent institutions like Stiftung Warentest. In this case it is an obstacle, that there is either a biased rating caused by the amount of the product evaluations especially if certain products have not been considered at all. Because of this, it is not possible to control for quality in a direct way. Therefore, control variables such as the popularity or the value of a companies' brand are considered.

All in all, I estimate the equations (3) by all of the three models per company and per concern. Furthermore, after having tested for heteroscedasticity (Breusch–Pagan test), I estimate the linear panel model regression by means of robust standard errors.

Awarded prizes

I also estimated the relationship between the advertising expenditure and the awarded prizes and nominated products as a binary outcome variable. Because both magazines award a prize or respectively a nominee for the best cosmetic products, the dependent variable can be defined as a nomination-dummy (for Glammy) as well as a winning-dummy of several companies within the investigated time-period. Because Glamour´s readers are asked to choose their favorite products out of three nominated products from various categories, the winners of the award do not play a role in the estimation. I only consider the nominated products by the editors beforehand. A probit regression model is used at this point.

4. Results and Discussion

In general, the results from the linear model confirm the results of some empirical studies in the literature to the extent that the advertising volume has a positive effect on coverage.
The estimation in column [1] of table 8 simply used advertising volume as an independent variable. The 10 most valuable brands for cosmetic products worldwide as a dummy variable were added in column [2] and a dummy if the advertised brand is a popular one [3 and 4] and to what extend brand awareness influences the dependent variable. Across all estimations, advertising volume has a positive significant impact on mentions of magazine's coverage even after controlling for brand awareness and brand popularity [3 and 4],

Because also brands without any advertising volume were mentioned in the editorial part of the investigated magazines and vice versa, the $m_{c,t}$- intercept, can be interpreted as the value if a company did not purchased any advertisement.

Table 9 includes the results of the panel poisson regression model (1+2) and panel negative binomial regression model (3+4) per year and company. It does not change the results substantially with regard to advertising volume. Advertising expenditures are significantly correlated to the amount of mentions. Controlling for the 10 most valuable brands for cosmetic products worldwide, the estimations results also turn out to be significant. Current brand awareness has a strong positive impact on the mentions of the representing company as well (see tables 8, 9, 10). Brand value and brand popularity turn out to be insignificant when controlling for brand awareness.

To focus on the group-level of companies (concerns), I ran all of the three model specifications for the years 2009-2012. As you can see in table 10, the only considerable difference is that the variable AdV becomes insignificant when panel negative binomial regression model is used (Model 3).

Besides, main problems in the estimation should be unconditionally taken into account. It deals with the difficulty of endogeneity caused by missing variables and the problem of reverse causality which leads to an overestimated impact. The proxy for advertising volume can easily create endogeneity.

Against this background of reverse causality the question arises, whether the mentions of companies have an impact of the amount of advertising volume in probably future editions. On the other side, mentions in magazines' coverage probably increase if the monetary volume of advertising is being purchased by company one or two years before. Table 11 (appendix) shows, that there are hardly any changes in level of significance when including time-variables as a dummy.

Awarded prizes

As mentioned above, there are also annual prize giving ceremonies for special beauty cosmetic products in both magazines. While the "Prix de Beautés" is annually awarded by an expert jury (dermatologists, industry representatives) in the Cosmopolitan, the annual awarded cosmetic-prize in the Glamour magazines ("Glammy") is selected by the public readers from a pool of nominated products that were chosen by the editors. To estimate the impact of advertising expenditure on nominees and awarded cosmetic products, it is necessary to control for quality of the nominated and awarded products as well.

First of all, I estimated a logit regression model in order to find a relationship between nomination for the "Glammy" and the advertising volume of the year. As you can see in estimation results in table 11 (appendix), the model is statistically significant, which means, that advertising volume also impacts the nomination and winning of a (cosmetic) product in this sample.

I further estimated a logit regression model in order to find a relationship between winning the "Prix de Beautés" as a price of special products and the advertising volume. As you can see in table 13 (appendix), the model is statistically significant, which means, that advertising volume also impacts the winning of an award. For estimating the influence of advertising volume, I used the advertising volume of

the previous year. The reason behind is that the award presentation of the beauty products is always in the beginning of the year.

5. Conclusion

Existing empirical studies on Media Bias are subjects of controversial discussions in the literature. In this paper, I focused on the so-called commercial Media Bias and investigated how coverage of companies is correlated with the amount of advertising expenditure in women's magazines in Germany. To get in line with the debated literature about whether commercial biases, caused by dependent markets, occur, this economic paper presents an empirical analysis of a commercial Media Bias in women's magazines.

In summary, it can be stated that there is a strong positive correlation between the advertising volume and the number of mentions in the editorial part in this sample. There is also a positive correlation between companies' nominees, winning an award and their advertising expenditure. Note, however, that this estimation is not perfect, because it is very difficult to measure the quality of the mentioned products in order to control for quality or for objective criteria. Because high-quality products are likely and naturally to be mentioned in magazines' coverage and high-quality companies are usually more profitable and therefore purchase a higher amount of advertising in the magazines, the regressions would not measure a media bias at all. In order to avoid these problems of endogeneity adequate instruments which are relevant and exogenous for using an instrumental variables technique have to be found (Wooldridge, 2010). Unfortunately, the problem of endogeneity cannot be easily solved.

Endnotes

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Figure 1. Percentage of Advertisements per sector, Cosmopolitan

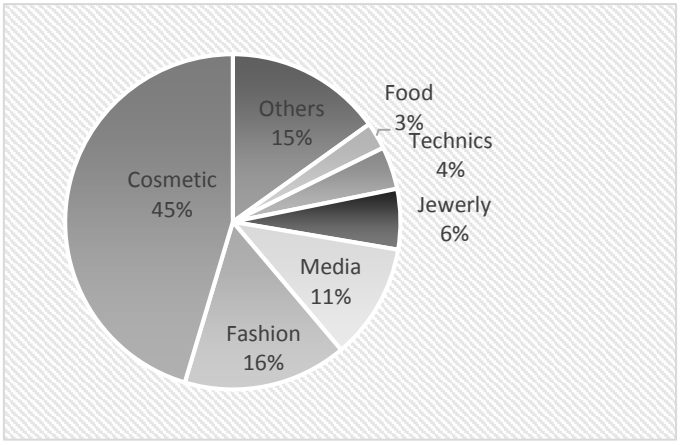

Figure 2. Percentage of Advertisements per sector, Glamour

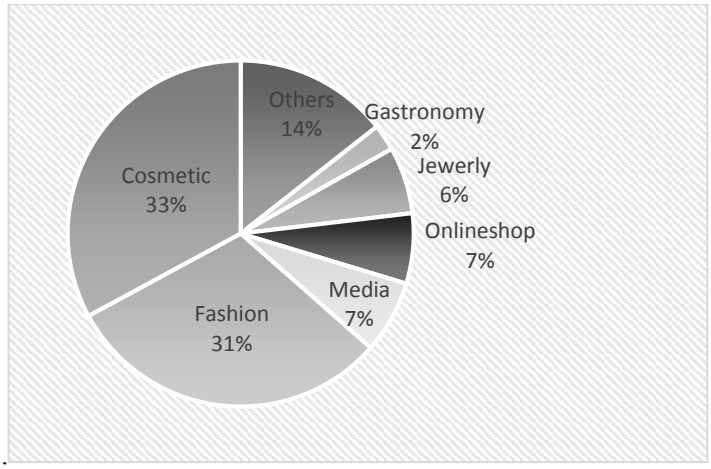

Table 1. Cosmopolitan 2009-2012, Advertising Volume (AdV) and Mentions in total per company

Ranking	Company	AdV in Euro	Company	Mentions
1	L'Oréal	6323460	L'Oréal	132
2	Nivea	3877407	Dior	132
3	Maybelline	2925220	Chanel	109
4	Lancôme	2892055	Lancôme	98
5	John Frieda	2725225	Artdeco	96
6	Dior	2647170	Nivea	94
7	Vichy	2440475	Clinique	87
8	Artdeco	2160750	Estée Lauder	87
9	Clinique	2043500	Clarins	87
10	Estée Lauder	1809000	Shiseido	82

Table 2. Cosmopolitan 2009-2012, Affiliated Group: Advertising Volume (AdV) and Mentions in total

Ranking	Concern	AdV in Euro	Concern	Mentions
1	L'Oréal	20934820	L'Oréal	695
2	Coty	5853455	Estée Lauder	301
3	Beiersdorf	5743022	Coty	231
4	Kao / Kanebo	5130525	LVMH	197
5	Procter & Gamble	4877265	Artdeco Cosmetic Gr.	174
6	Estée Lauder	4033400	Procter & Gamble	168
7	LVMH	3672270	Beiersdorf	138
8	Shiseido Co.	3124210	Clarins	117
9	Artdeco Cosmetic Gr.	2194250	Shiseido Co.	111
10	Unilever	1792585	Chanel	109

Table 3. Glamour 2009-2012, Advertising Volume (AdV) and Mentions in total

Ranking	Company	AdV in Euro	Company	Mentions
1	John Frieda	2704398	Dior	141
2	Nivea	2632982	Chanel	108
3	Dior	2358024	Lancôme	101
4	Artdeco	2141300	L'Oréal	98
5	L'Oréal	2095128	Yves Saint Laurent	91
6	Clinique	1888855	Clinique	90
7	Douglas	1839645	Clarins	87
8	Garnier	1509926	Nivea	70
9	Guhl	1277300	MAC	68
10	Yves Saint Laurent	1244160	Artdeco	66

Table 4. Glamour 2009-2012, Affiliated Group: Advertising Volume (AdV) and Mentions in total

Ranking	Concern	AdV in Euro	Concern	Mentions
1	L'Oréal	10532449	L'Oréal	694
2	Procter & Gamble	5385723	Estée Lauder	337
3	Coty	4014975	LVMH	301
4	Kao / Kanebo	3981698	Coty	250
5	Beiersdorf	3375342	Procter & Gamble	178
6	Estée Lauder	3226632	Clarins	126
7	LVMH	3045076	Beiersdorf	109
8	Artdeco Cosmetic Gr.	2365850	Chanel	108
9	Douglas	1871845	Artdeco Cosmetic Gr.	102
10	Clarins	1629225	Kao / Kanebo	93

Table 5. Advertising Volume (AdV) and Mentions in total for both magazines

Ranking	Company	AdV in Euro	Company	Mentions
1	L'Oréal	8418588	Dior	273
2	Nivea	6510389	L'Oréal	230
3	John Frieda	5429623	Chanel	217
4	Dior	5005194	Lancôme	197
5	Artdeco	4302050	Clinique	177
6	Maybelline	4144617	Clarins	174
7	Lancôme	3937255	Nivea	164
8	Clinique	3932355	Artdeco	162
9	Vichy	3431627	Yves Saint Lau.	149
10	Douglas	3262045	Estée Lauder	147

Table 6. Affiliated Group: Advertising Volume (AdV) and Mentions in total for both magazines

Ranking	Concern	AdV in Euro	Concern	Mentions
1	L'Oréal	31467269	L'Oréal	1389
2	Procter & Gamble	10262988	Estée Lauder	638
3	Coty	9868430	LVMH	498
4	Beiersdorf	9118364	Coty	481
5	Kao / Kanebo	9112223	Procter & Gamble	346
6	Estée Lauder	7260032	Artdeco Cosmetic Gr.	276
7	LVMH	6717346	Beiersdorf	247
8	Artdeco Cosmetic Gr.	4560100	Clarins	243
9	Shiseido Co.	3431870	Chanel	217
10	Douglas	3359245	Kao / Kanebo	184

Table 7. Descriptive statistics for all variables

Variable	Obs	Mean	Std. Dev.	Min	Max	Sum
PER ISSUE						
Magazine	5813	152.589	.4993722	1	2	2
Company	5813	3.562.389	2.065.737	1	749	749
Concern	5813	2.383.406	1.312.226	1	531	531
Mentions	5813	1.111.818	1.161.682	0	15	6463
Advertising Volume	5813	21250.31	33867.88	0	455600	1.24e+08
Valuable Brand	5813	.1140547	.317905	0	1	663
Brand awareness %	1784	5.143.946	2.121.499	9	80	1784
Brand popularity	5813	.1605023	.3671029	0	1	933
PER COMPANY						
Mentions	1416	4.564.266	9.040.003	0	79	6463
Advertising Volume	1416	87237.32	246375.7	0	2465022	1.24e+08
Valuable Brand	1416	.0275424	.1637154	0	1	39
Brand awareness %	145	4.372.414	2.234.747	9	80	145
Brand popularity	1416	.0416667	.1998969	0	1	59

Table 8. Linear panel model regression per year and over company by means of robust estimators

VARIABLES	(1) Model	(2) Model	(3) Model	(4) Model
$AdV_{c,t}$	0.0000283***	0.0000272***	0.0000226***	0.0000293***
	(15.61)	(12.18)	(11.54)	(7.70)
Valuable Brand		3.409	4.985*	-0.247
		(1.36)	(2.23)	(-0.05)
Brand popularity			10.97***	-9.616***
			(5.82)	(-3.59)
Brand awareness %				0.230***
				(4.03)
_cons	2.093***	2.097***	1.995***	4.192**
	(16.60)	(16.62)	(17.11)	(2.78)
N	1416	1416	1416	145

t statistics in parentheses

* p < 0.05, ** p < 0.01, *** p < 0.001

Table 9. Panel poisson regression model (1+2) and panel negative binomial regression model (3+4) per year and company

VARIABLES	(1) Model	(2) Model	(3) Model	(4) Model
$AdV_{c,t}$	0.000000769***	0.000000519***	0.000000785***	0.000000552***
	(10.54)	(4.74)	(9.36)	(4.05)
Valuable Brand	1.392***	0.457	1.361***	0.665
	(5.29)	(1.16)	(5.29)	(1.64)
Brand popularity	1.742***	-0.424	1.686***	-0.389
	(8.14)	(-1.17)	(8.31)	(-1.00)
Brand awareness %		0.0251**		0.0227**
		(3.01)		(2.63)
_cons	0.780***	1.560***	2.173***	2.099***
	(21.99)	(5.70)	(14.10)	(4.58)
ln_alpha _cons	-0.459***	-0.707**		
	(-6.86)	(-3.02)		
ln_r _cons			2.370***	1.821***
			(19.40)	(5.50)
ln_s _cons			0.870***	1.182***
			(9.68)	(3.89)
N	1416	145	1416	145

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 10. Linear panel model regression (1), panel poisson regression model (2) and panel negative binomial regression model (3) per year and concern

VARIABLES	(1) Model	(2) Model	(3) Model
$AdV_{c,t}$	3.16e-05***	9.57e-08**	8.43e-08
	(4.04e-06)	(4.24e-08)	(5.15e-08)
Valuable Brand	36.86*	0.874	0.410
	(20.90)	(0.725)	(0.717)
Brand popularity	-13.58	0.00767	-0.496
	(20.21)	(0.618)	(0.789)
Brand awareness %	0.724*	0.0447***	0.0532***
	(0.427)	(0.0168)	(0.0178)
_cons	-8.167	1.048*	1.367**
	(13.14)	(0.592)	(0.696)
ln_alpha		-0.00303	
_cons		(0.288)	
ln_r			1.098***
_cons			(0.417)
ln_s			0.349
_cons			(0.343)
N	69	69	69
Number of konz	21	21	21

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Appendix

Table 11. Linear panel model regression by means of robust estimators

VARIABLES	(1) Model
$AdV_{c,t}$	1.87e-05*** (2.58e-06)
Valuable Brand	7.751** (3.791)
Brand popularity	13.09*** (3.418)
2010. Year	0.456** (0.215)
2011. Year	0.659*** (0.236)
2012. Year	0.589** (0.261)
Constant	1.387*** (0.192)
Observations	1,416
Number of companies	749

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 12. Logit regression output for nomination "Glammy" as a dependent variable

	(1) r1	(2) r2	(3) r3	(4) r4
VARIABLES	**Model**	**Model**	**Model**	**Model**
$AdV_{c,t}$	1.24e-05***	1.08e-05***	9.57e-06***	1.08e-05***
	(1.13e-06)	(1.16e-06)	(2.72e-06)	(1.16e-06)
Brand popularity		2.532***	-0.352	2.520***
		(0.521)	(1.059)	(0.521)
Valuable Brand		1.132**	-1.232	1.122**
		(0.530)	(1.116)	(0.530)
2010.Year				0.0127
				(0.303)
2011.Year				-0.228
				(0.308)
2012.Year				-0.0161
				(0.294)
Brand awareness %			0.0388*	
			(0.0213)	
Constant	-2.512***	-2.586***	-2.406***	-2.531***
	(0.124)	(0.128)	(0.733)	(0.227)
Observations	1,052	1,052	130	1,052
ll	-332.1	-317.1	-55.17	-316.7
df_m	1	3	4	6
chi2	276.2	306.3	68.38	307.1

Robust standard errors in parenthese
*** p<0.01, ** p<0.05, * p<0.1

Table 13. Logit regression output for winning the "Prix de Beautés" as a dependent Variable

VARIABLES	(1) r1 Model	(2) r2 Model
$AdV_{c,t}$	2.19e-06***	1.77e-06**
	(5.94e-07)	(7.39e-07)
Valuable Brand		0.397
		(0.561)
Brand popularity		0.448
		(0.520)
Constant	-2.004***	-2.009***
	(0.237)	(0.239)
Observations	243	243
Ll	-111.4	-111.0
df_m	1	3
chi2	15.84	16.79

Robust standard errors in parenthese
*** p<0.01, ** p<0.05, * p<0.1