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The value of celebrity endorsements: A stock market perspective

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Abstract Are celebrity endorsements worthwhile investments in advertising? To answer this question, we analyze a unique sample of 101 announcements made between 1996 and 2008 by firms listed in the USA. Internet is the main medium of communication for these announcements. We employ event study methodology and document statistically insignificant abnormal returns around the announcement dates. This finding is consistent with the notion that the incremental benefits from celebrity endorsements closely match the incremental costs due to such contracts. Further, we investigate if the announcement date return depends on a number of characteristics that are often used in the endorsement literature. As a result, we find that endorsements of technology industry products coincide with significant positive abnormal returns around the announcement dates. Finally, we find weak support for the match-up hypothesis between celebrities and endorsed products.

Keywords Event study · Celebrity endorsement · Match-up · Internet · Marketing

JEL Classification G14 · M37

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1 Introduction and prior work

The use of celebrities to endorse products and services has been a popular marketing strategy used by corporations for decades. Estimates suggest that as much as 25% of all television commercials (Erdogan et al. 2001) and 10% of advertiser's budgets involve celebrity endorsements (Agrawal and Kamakura 1995). As many as 25% of American companies use celebrities in their advertising campaigns (Shimp 2000). In 2001, US companies paid $897 million to athletes, coaches, and sports personalities (Sports Business Journal 2002). In 2003, Nike spent $1.44 billion on celebrity endorsements (CNN Money 2003). Between two and three billion dollars were spent on celebrity advertising in 2006 in USA alone (White et al. 2009). Such popularity of celebrity endorsements is hardly surprising. There is a bulk of anecdotal evidence linking the use of celebrities in advertising campaigns to improvement in operating performance. Estimates place Michael Jordan's endorsement activities to be worth $10 billion in the course of his NBA career (Erdogan et al. 2001). PepsiCo's management has attributed a 2% global market share increase to Spice Girls' endorsement (Advertising Age International 1997).

Indeed, theoretical literature focusing on potential positive aspects of celebrity endorsements has been well developed. Among the main justifications for the use of celebrity endorsements are that celebrities make advertisement believable and enhance consumer recognition (Kamins et al. 1989; Friedman and Friedman 1979). Celebrities are believed to help in the recognition of brand names and to create both a positive attitude and a distinct personality for the endorsed brand (Petty et al. 1983; Kamins et al. 1989; McCracken 1989). It is generally believed that retailers have a better chance of communicating their message to consumers when celebrities are featured in advertising campaigns (Choi and Rifon 2007).

Given the anecdotal and academic evidence of the potential beneficial effect of celebrity endorsements on sales and market shares, one might expect a positive impact of celebrity endorsement announcements on respective firms' stock prices. After all, the stock price represents the discounted value of the expected future cash flows, which supposedly increase following the involvement of a celebrity in the advertising campaign.[1] A prominent paper investigating the issue in an event study setting is Agrawal and Kamakura (1995). The authors assume that the announcement of a celebrity endorsement contract is used as information by market analysts and investors alike to evaluate the potential profitability of the contract, which will subsequently affect the future profits of a firm. They analyze 110 celebrity endorsement announcements by 35 firms involving 87 celebrities. On average, the impact of these announcements on stock returns is found to be marginally positive with +0.44% excess return on announcement-day. This suggests that celebrity

[1] It is important to note that celebrity endorsements come at a significant cost to companies. The fees in our sample range from fairly modest (£0.75 million paid by Avon to the Williams sisters or $3 million paid by Hershey Co. to Jessica and Ashlee Simpson) to very significant ($25 million paid by GM to Tiger Woods or £30 million paid by Sony to Dale Earnhardt Jr.). Endorsement fees are not the only expense of the endorsement campaign. Other outlays (management expenses, TV ad costs, etc.) have to be considered as well. Our goal, however, is not to explicitly analyze endorsement fees and costs, but rather concentrate on the net present value of a celebrity endorsement, which accounts for all cash flows associated with it, and should be manifested in announcement-day stock returns.

endorsement contracts are generally being viewed as a worthwhile investment in advertising. However, cumulative abnormal returns are significant for the announcement date only; for all other event windows, ranging from (−1, 1) to (−10, 10), cumulative abnormal returns are mixed and not significantly different from zero. Farrell et al. (2000) explore the impact of Tiger Woods' tournament performance on endorsing firms' value. The authors document no relationship for Fortune Brands and American Express, but a significant relationship in case of Nike. Mathur et al. (1997) document that the anticipation of Michael Jordan's return to the NBA resulted in an average increase in market-adjusted values of client firms by almost 2%. Fizel et al. (2008) examine 148 endorsement announcements by non-mega-star athletes and document insignificant impact on the market value of the firm.[2]

Low economic significance of returns in Agrawal and Kamakura (1995), as well as mixed results regarding stock market responses to celebrity endorsement announcements in subsequent studies motivates us to investigate whether the market views celebrity endorsements as positive events. Marketing literature offers several arguments why the use of celebrity endorsements is a potentially risky strategy. One of the common concerns is that consumers will focus their attention on the celebrity rather than on the brand being advertized (Rossiter and Percy 1987; Costanzo and Goodnight 2006). A celebrity can associate herself with too many brands, leading to consumers questioning celebrity's true motives (Mowen and Brown 1981) or disappear from the public spotlight altogether (Ziegel 1983). Public controversy can also be associated with celebrity endorsements. Some of the better-known examples are O.J. Simpson and Hertz Corporation (Erdogan 1999), and Kobe Bryant and several major companies, including McDonalds, Nike, Sprite, and Spalding (White et al. 2009), not to mention the most recent controversy involving Tiger Woods.[3]

Analyzing a recent sample of 101 celebrity endorsement announcements involving 40 firms and 85 celebrities, we document statistically insignificant announcement-day abnormal returns. Cumulative abnormal returns around the announcement date also fail to reach statistical significance. These results suggest that the net discounted cash flow from celebrity endorsement deals is close to zero. We investigate the impact of essential endorsers' characteristics (gender, individual or group, athlete or entertainer, etc.), as well as firm characteristics (market value and price-to-book ratio) on announcement-day returns, and do not document a significant impact of these characteristics. However, we do find that endorsements of technology industry products coincide with positive and statistically significant

[2] A somewhat related strand of literature analyzes the impact of sponsorship contracts on stock returns. The results are generally mixed. Mishra et al. (1997) analyze 76 announcements of sponsorship events. They document positive abnormal returns on announcement-day, but insignificant returns for longer event windows. Farrell and Frame (1997) document negative announcement-day returns for 26 sponsorship announcements at the 1996 Atlanta Olympic Games. However, Miyazaki and Morgan (2001) document positive abnormal returns (albeit for a very specific event window) of 27 Olympic sponsorship announcements. Samitas et al. (2008) find marginally positive returns for Athens Olympic Games sponsorship announcements. Clark et al. (2009) analyze the impact of sponsorship announcements of tennis and golf tournaments, auto racing, and college football on stock returns in an event study setting. In general, the impact is not statistically significant. However, congruence between sport and a sponsor is significantly related to perceived sponsorship success.

[3] On December 12, 2009, Gillette announced that they would stop all advertising involving Tiger Woods. On December 13, Accenture has severed its ties with Woods.

abnormal returns. We further analyze the "match-up hypothesis" between a celebrity and an endorsed product. We assess several self-appointed congruence relationships between endorsers and products (e.g., an athlete endorsing sports-related products and a female endorsing beauty products). However, the data provides only weak support for the match-up hypothesis.

The rest of the paper is organized as follows. Section 2 describes the data. Section 3 provides the description of the empirical methodology. Section 4 presents the results for abnormal stock returns. Section 5 analyzes the impact of endorsement deal characteristics on announcement-day returns. Section 6 concludes.

2 Data description

Our sample consists of companies listed on the New York Stock Exchange and the NASDAQ stock market. The source for finding the endorsements is the internet. This distinguishes our study from most of the existing event studies on celebrity endorsements, which mainly use only newspaper archives. In the past, newspapers were the best and often the only real source of corporate news. However, in current times, much of the news is disseminated through the internet and often reaches the general public more quickly than the next day's newspaper.

Various search methods on the internet were used, including the Google and Yahoo search engines, the companies' proprietary websites, and the Factiva database. As a celebrity endorsement contract is not always named as such, our search had to remain manual. For each endorsement announcement encountered on the internet, the press release on the corporate website was studied first. This text is provided by the company to its stakeholders and investors. At times, the company only archives the most recent endorsement press release and deletes any announcement of preceding endorsements. In these cases, we turn to the major media websites[4] to determine the precise announcement date. After collecting the announcement from the initial resource, every single announcement date is confirmed with the Factiva database in order to obtain maximum accuracy. Factiva database covers 46 major news and business publications in the USA. Therefore, we assume that endorsement announcements identified by our algorithm will reach a fairly wide audience. Admittedly, our approach is not perfect and may result in some announcements not being identified. However, we believe that such a selection method will miss the events that are less likely to reach the wide investment community and will, therefore, have less impact on announcement-day returns.

It should be noted that if the endorsement is announced during a weekend, we assume that the following Monday is the announcement date, as this coincides with the first trading opportunity. Furthermore, a limited number of the companies are European or Japanese rather than American.[5] To maintain consistency in these cases, the US-listed ADR prices are used instead of the European stock prices. Finally, we discard those endorsement announcements in which a company extends an existing endorsement contract with the same celebrity. The extended contracts are likely to

[4] Such as CNN, Reuters, and BBC.
[5] These are Deutsche Telecom, Siemens and Sony.

have a smaller impact on both consumer and investor behavior.[6] Following this procedure, we identify a total of 101 celebrity endorsements announced between the years of 1996 and 2008. Some companies have used celebrity endorsements more than once. As a result, we have a total of 40 firms in the sample.

In order to isolate the celebrity endorsement effect as much as possible, we examine the observations for the presence of confounding effects. We refer to McWilliams and Siegel (1997) and Johnston (2007) who report this check as one of the most critical research design issues in event studies. For each observation in the sample, we inspect all news messages that are released during the (−10, +10) event window. The window length of 21 days should be long enough to capture any potentially significant effects of the endorsement announcements. Stretching the window even longer greatly exacerbates the difficulty of controlling for confounding effects. For all 21 days in the event window, we check for the presence of an earnings announcement, a declaration of dividend, an equity offering, a large tax charge, the introduction of a new brand, a change in company name, an announcement of a takeover bid, or the withdrawal thereof. We also determine if any celebrity is announced twice within two overlapping event windows or if two different celebrities' endorsements are announced for the same company during two overlapping event windows. If any of the above confounding effects is found, the observation is removed from the sample.

Next, we conduct an outlier analysis. We check for each individual endorsement if any relatively large returns occur during the (−10, +10) window. Out of the total of 101 (no. of endorsements)×21 (days in event window)=2,121 returns, we find only two returns exceeding 5% in absolute terms.[7] We verify with Factiva that the news released around the relevant dates contains no major events that may have caused these larger returns. We find no evidence of the presence of such effects, and therefore, we do not remove these observations from the sample.

3 Empirical methodology

In this section, we briefly describe the methodology used to conduct our event study. Most calculations are done in the Eventus program (see Cowan 2008). We use a common event study technique to calculate abnormal returns and to conduct significance tests. We refer to MacKinlay (1997) for an overview of the event study methodology and to Clark et al. (2009) for a recent example of an application of this theory in an excellent study on title sponsorship announcements.

The market model (CAPM) assumes that security returns follow a single factor model:

$$R_{jt} = \alpha_j + \beta_j R_{mt} + \varepsilon_{jt} \tag{1}$$

where R_{jt} is the rate of return of the stock of the jth firm on day t, R_{mt} is the rate of return of the CRSP equally weighted market index on day t, ε_{jt} is an error term that

[6] Seven endorsement extensions are identified. As a robustness check, we include these observations back into the sample and find no significant impact on our results.

[7] Pritamani and Singal (2001) use three alternative thresholds to identify significant price changes—5% and 10% and three standard deviations in returns. Their results are generally robust to the choice of a cut-off. We select the most conservative threshold.

is assumed to follow a GARCH(1,1) process[8], and β_j is a parameter that measures the sensitivity of R_{jt} to the market index (see Cowan 2008, p. 69–70). The abnormal return for stock j on day t is defined as

$$A_{jt} = R_{jt} - \left(\widehat{\alpha}_j + \widehat{\beta}_j R_{mt}\right) \tag{2}$$

where the parameters $\widehat{\alpha}_j$ and $\widehat{\beta}_j$ are maximum likelihood estimates of α_j and β_j, using data from a 255 trading-day estimation period ending 46 trading days before the event date. We use the Scholes–Williams beta estimator adjustments to mitigate estimation biases arising from illiquid trading (see Cowan 2008, p. 71 or Clark et al. 2009, p. 181).

Average abnormal returns AAR_t for event day t are calculated as

$$AAR_t = \frac{1}{N}\sum_{j=1}^{N} A_{jt} \tag{3}$$

where N equals the total number of announcements.

The event period is defined as running from 10 days before through 10 days after the event date and is broken into various "windows" for abnormal return calculations. For the windows between days T_1 and T_2, cumulative average abnormal returns $CAAR_{T1,T2}$ are calculated as

$$CAAR_{T1,T2} = \frac{1}{N}\sum_{j=1}^{N}\sum_{t=T_1}^{T_2} A_{jt} \tag{4}$$

We report adjusted Patell test statistics corrected for the fact that within the window, the abnormal returns for each stock may be serially correlated. The Patell t test may, however, still be misspecified due to non-normality of stock returns. We then use the nonparametric rank test by Corrado (1989) to check the robustness of the conclusions based on the parametric Patell test.

4 Abnormal stock returns around the endorsement announcements

In this section, we analyze the short-term effects of the celebrity announcement on the stock price.

Table 1 reports average abnormal returns across the event window and shows that the abnormal returns are insignificant throughout. Event day returns are equal to −0.01%. The data show no support for any announcement-day effect. Next, we investigate the behavior of cumulative abnormal returns (CARs) throughout the event window. Figure 1 depicts cumulative average abnormal returns over a 4-week period.[9]

Figure 1 shows that the cumulative abnormal returns do not react strongly to the endorsement announcements. Additional evidence to this observation is reported in Table 2, which presents cumulative average abnormal returns computed over the

[8] Because in daily return data, periods of low volatility alternate with periods of high volatility.
[9] We choose the same event window as Agrawal and Kamakura (1995).

Table 1 Average abnormal returns around announcement date

Event day	Abnormal return	Adjusted Patell test	Rank *Z* test	Cumulative abnormal return
−10	−0.21%	−1.05	−0.47	−0.21%
−9	0.17%	0.87	−0.27	−0.03%
−8	−0.09%	−0.46	−0.91	−0.12%
−7	0.27%	1.38	1.16	0.15%
−6	0.25%	1.27	2.08[a]	0.40%
−5	−0.08%	−0.41	−0.68	0.32%
−4	0.03%	0.16	−0.55	0.35%
−3	−0.12%	−0.62	−0.55	0.23%
−2	−0.12%	−0.61	−1.35	0.11%
−1	−0.06%	−0.30	−1.03	0.05%
0	−0.01%	−0.03	−0.94	0.04%
1	0.15%	0.78	1.03	0.19%
2	0.07%	0.36	0.76	0.27%
3	0.27%	1.40	1.58	0.54%
4	0.05%	0.25	−0.56	0.59%
5	−0.14%	−0.73	−0.30	0.45%
6	−0.14%	−0.70	−0.31	0.31%
7	−0.10%	−0.52	−0.46	0.21%
8	0.22%	1.14	0.48	0.43%
9	−0.16%	−0.83	0.21	0.27%
10	−0.11%	−0.58	−0.38	0.15%

Presents average abnormal returns and running cumulative average abnormal returns around celebrity endorsement announcements in event time, with event day 0 corresponding to the announcement. Cumulative average abnormal returns are aggregated from 10 days prior to the announcement

[a] Significance at the 5% level, using a two-tailed test

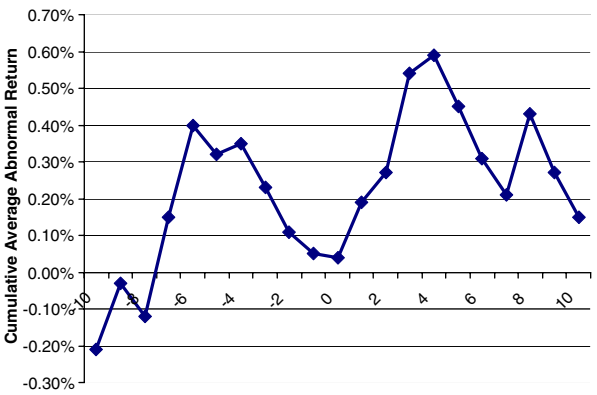

Fig. 1 The figure represents the dynamics of running cumulative abnormal returns throughout the event window. All cumulative abnormal returns are aggregated starting at event day−10

Table 2 Cumulative average abnormal returns around announcement date

Event window	Mean cumulative abnormal return	Portfolio time-series T-statistic	Rank *Z* test
(−10, +10)	0.15%	0.17	−0.32
(−10, +2)	0.27%	0.38	−0.47
(−5, +5)	0.05%	0.07	−0.78
(−5, +2)	−0.13%	−0.24	−1.17
(−4, 0)	−0.28%	−0.63	−1.97[a]
(−2, 0)	−0.19%	−0.55	−1.92
(−1, 0)	−0.07%	−0.24	−1.39
(−1, +1)	0.09%	0.26	−0.54
(−1, +10)	0.05%	0.07	0.02
(0, +1)	0.15%	0.53	0.06
(0, +4)	0.54%	1.23	0.84
(+1, +3)	0.50%	1.47	1.94
(+1, +4)	0.55%	1.40	1.40
(+1, +5)	0.40%	0.92	1.12
(+1, +10)	0.11%	0.18	0.65

Presents cumulative average abnormal returns computed over various windows around celebrity endorsement announcements in event time, with event day 0 corresponding to the announcement

[a] Significance at the 5% level, using a two-tailed test

various sub-intervals of the event window. Again, we fail to document statistical significance regardless of the computation window. Although Fig. 1 does show an increase in cumulative returns immediately following the announcement, a lack of statistical significance makes it difficult to reach strong conclusions.

Further, as discussed in McWilliams and Siegel (1997), the test statistics in event studies may be quite sensitive to the presence of outliers. Outliers could potentially be a problem when the percentage of abnormal returns is of opposite direction (either very high or very low) to that of the average abnormal return. In our results, we find no such indication. Hence, we have no reason to believe that our results are driven by the presence of outliers.

Table 2 presents cumulative abnormal returns computed over a variety of sample windows. Only the cumulative abnormal return computed over the (−4, 0) sample window is significant at a 5% level, according to the rank test. This suggests some negative pressure on the pre-announcement date returns. However, the *t* test for this window is insignificant, and the statistical evidence thus is ambiguous not allowing us to make strong claims regarding any pre-announcement effects. For all other windows, the cumulative returns are found to be insignificant at the 5% level for both tests.

One could argue that celebrity endorsement is aimed, in part, at broadening the customer base. Therefore, one could make the case that its effect might be better measured relative to competitor firms than to the overall market or its own historic returns. To evaluate the validity of such a claim, we investigate the effects of celebrity endorsement announcements on firms' stock price performance relative to

similar firms within the same industries. In this matched sample approach, we employ the following matching algorithm. For each firm with an endorsement announcement, another firm is selected from the same industry (defined at a two-digit SIC level) and matched to within 30% on size (defined as market capitalization) and book-to-market ratio.[10] We find results similar to those reported above, that is, abnormal returns fail to reach statistical significance throughout the event window.

Finally, we find that our main conclusions do not depend much on the choice of market model applied. To illustrate this point, we also calculate abnormal returns by assuming a simplistic version of the market model with $\widehat{\alpha}_j = 0$ and $\widehat{\beta}_j = 1$ for all j= 1,..,N.[11] We use OLS, do not assume GARCH, and do not correct for any of the non-normality characteristics in the daily data. These crude average abnormal return calculations turn out very similar to the more sophisticated version reported in this paper, with statistical significance levels failing to reach a 5% threshold.[12]

5 Celebrity endorsement characteristics

Next, we investigate if the announcement return depends on a number of characteristics that are often used in the endorsement literature. We identify the following 11 variables:

1. The gender of the celebrity endorser. Costanzo and Goodnight (2006) assess whether respondents may better recall female celebrities than their male counterparts. Hsu and McDonald (2002) report that consumers find celebrity endorsers of the same gender more appealing. Boyd and Shank (2004) find that "men trust men and women trust women" but suggest that male athlete endorsers may be more effective than their female counterparts. Several other studies also examine the gender of the endorser and its relation to the consumers' perception of the endorsement (see for example Baker and Churchill (1977), Fizel et al. (2008), and Ohanian (1991)). In general, the results are mixed, which may be caused by the fact that the findings depend strongly on the endorsers, the sample, and the marketing communications strategy employed.
2. Whether the endorser is an athlete or not. Agrawal and Kamakura (1995) find no evidence that sports celebrities endorsement announcements coincide with significant abnormal returns. Fink et al. (2004) find that an athlete's attractiveness and expertise are positively related to the perceived fit with an athletic event (see also Byrne et al. (2003) and Fizel et al. (2008)). We categorize as an athlete all celebrities that we perceive as being sports-related, independent of whether they are involved in, for example, golf, tennis, hockey, or race car driving.
3. Whether it is an individual or a group of celebrities, e.g., a soccer team. We refer to Lear et al. (2009) who also make such a distinction. The idea behind this characteristic is that a multitude of celebrities together may make the endorsement more convincing to a wider audience, as opposed to using one celebrity only.

[10] The matched sample is available from the corresponding author upon request.

[11] Actual sample mean (median) estimates of α and β equal 0.00051 (0.00054) and 0.85 (0.86), respectively.

[12] We do not report these results to save space. They are available from the corresponding author upon request.

4. Whether the celebrity endorses only one firm or multiple. Tripp et al. (1994) indicate that multiple product endorsements by the same celebrity reduce the credibility and increase the liability of the individual celebrity.
5. Whether the firm employs only one celebrity endorser or multiple. Hsu and McDonald (2002) discuss that some marketers choose to employ multiple celebrities to promote their brands or products, also called "multiplicity." Seno and Lukas (2007) discuss that celebrity multiplicity may have an indirect and positive effect on brand equity. In both multiplicity characteristics (4) and (5), we count only those firms that are part of our sample. Other endorsements, including those we have removed because of confounding effects, are not used to determine multiplicity.
6. The age of the celebrity. Hsu and McDonald (2002) use age as one of the celebrity endorser characteristics. To assess this characteristic, we remove the group endorsements from the sample. For these endorsements, we find it ambiguous what age to use.
7. The size of the company measured by its market value. Clark et al. (2009) use assets as an indicator of firm size and find that large companies benefit more from sponsorship announcements. Firm size is also used in Clark et al. (2002) and in Cornwell et al. (2001) as a factor. Both these studies find a negative and statistically significant relationship with sponsorship announcements. Apparently, the results are mixed for the relation between sponsorship announcement returns and firm size.
8. The price-to-book value of the company is used as a proxy for the presence of agency risk. We refer to Grinblatt and Titman (1998, p. 670). If the price-to-book value is low, the firm is believed to have unfavorable investment opportunities. This would create a potential agency problem if the firm's management decides to overinvest in, for example, celebrity endorsement campaigns that are detrimental to the shareholders' best interests. Clark et al. (2009) use cash flow as an indicator of potential agency effects and find no significant relationship with abnormal returns of sponsoring firms.
9. Whether the firm is categorized as a technology industry firm or not. We refer to Biswas et al. (2006) for a study on the differential effect between celebrity and expert endorsements for high-technology oriented products. Further, Clark et al. (2002, 2009) find a positive relationship between abnormal returns and high tech firms announcing a sponsorship. They report that investors may perceive a technology firm's sponsorship announcement as a positive signal because the company is strong enough to bear such usually substantial and long-term marketing costs.
10. If the endorsement announcement is published in one or more of three major newspapers (USA Today, Wall Street Journal, and New York Times). Ikenberry et al. (1995), Michaely et al. (1995), and Pritamani and Singal (2001) point out that the degree of dissemination of an information signal should play a role in post-event return predictability. Cornwell et al. (2001) use a dummy variable to account for the strongly increased exposure when a sponsored event is covered on television, as opposed to receiving radio coverage alone.
11. Whether the endorser and the endorsed product match up. It has been long established that a proper match between a product and an endorser can enhance

the effectiveness of the endorsement (Atkin and Block 1983; Baker and Churchill 1977; Caballero and Solomon 1984; Clark et al. 2009; Cornwell et al. 2001; Erdogan 1999; Kahle and Homer 1985; Kamins 1990; Liu et al. 2007; McCracken 1989; Misra and Beatty 1990; Ohanian 1991; Peterson and Kerin 1977; Pruitt et al. 2004). Brand and celebrity congruence improves brand recall, brand affect, and purchase intentions (Kamins 1990; Kamins and Gupta 1994; Misra and Beatty 1990). Seno and Lukas (2007) argue that celebrity endorsement may be seen as co-branding (or "brand bundling" or "brand alliance"). The co-branded products' image and position are difficult to replicate by competing brands (Keller 1998). The success of such a co-branding strategy depends on the match-up between the endorser and the product (Till and Shimp 1998). Celebrity credibility depends on the consumers' perception of the celebrity's expertise and trustworthiness (Ohanian 1991).

Erdogan (1999) argues that the absence of a clear link between the endorser and the endorsed product may lead consumers to disbelieve the celebrity. A "vampire effect" may occur (Evans 1998) when the celebrity is remembered but not the endorsed product. The target audience will have the impression that the celebrity is endorsing a product merely to receive a substantial financial fee and the endorsement itself will not be believable. An example of a lack of congruence is given by Byrne et al. (2003): John Cleese endorsed Sainsbury and "both employees and customers alike felt that Cleese was not the right personality to personify the supermarket's quality image." A distinct incongruence is broadly seen as undesirable. The match-up depends on the public's perception of the celebrity's image (McCracken 1989).

We assume the existence of a number of congruence as well as incongruence relationships. First, the use of athletes to endorse sports-related products is often used as an example of the match-up hypothesis put to practice (Byrne et al. 2003; Fink et al. 2004; Fizel et al. 2008; Lee and Thorson 2008; Liu et al. 2007; Louie et al. 2001; Simmers et al. 2009; Till and Busler 1998). Athletes are seen as having knowledge, experience, and expertise in sports-related products, which in our sample are categorized as belonging to the Sporting Goods industry.

The second congruence relationship we assess is the one between beauty products and gender. The relevance of gender matching between the endorser and the products' target group has also been discussed by Hsu and McDonald (2002), Costanzo and Goodnight (2006), and Simmers et al. (2009). An extensive list of academic marketing articles employs examples in which female celebrities endorse beauty products. For example, Baker and Churchill (1977) find that attractive female endorsers of perfume, cologne, and aftershave lotions have a stronger positive impact on the ratings than an attractive male endorser. Further, Caballero and Pride (1984) suggest that when studying the match-up hypothesis, personal care products may be linked to highly attractive female sales representatives. More recently, Seno and Lukas (2007) use the example of cosmetics firm Elizabeth Arden (in the personal care sector) to employ actress Catherine Zeta-Jones as the company's "public face". Finally, Till and Busler (1998) refer to the "natural fit" between Elizabeth Taylor and White Diamonds perfume. We assume the presence of such congruence between female endorsers and the products that are categorized in either the Personal Products or Apparel Stores industries.

Finally, we posit that the industries restaurants (e.g., McDonalds), confectioners (e.g., Wrigley), and beverages–soft drinks (e.g., Coca-Cola and Pepsi-Cola) are not necessarily the most healthy and optimal choices for professional athletes. For example, USA Today on March 22, 2001 reported that "At first glance, the high profile Williams sisters and old-fashioned Wrigley seem like an odd couple." Furthermore, Wrigley stated that it had never used an athlete endorser before in its 87-year history of the Doublemint brand. For these reasons, we assume that there is at least some level of incongruence between a professional athlete and the above industries.

5.1 Regression results

To assess if the abnormal returns depend on any of the above characteristics, we run 11 separate cross-sectional ordinary least squares regressions. More precisely, we estimate Eqs. 5a and 5b below:

$$A_{j0} = \gamma_j^A + \delta_j^A X_{j0}^A + \varphi_j^A \tag{5a}$$

$$\mathrm{CAR}_{j(-1,+1)} = \gamma_j^{\mathrm{CAR}} + \delta_j^{\mathrm{CAR}} X_{j0}^{\mathrm{CAR}} + \varphi_j^{\mathrm{CAR}} \tag{5b}$$

In Eqs. 5a and 5b, the dependent variable A_{j0} is the abnormal return for stock j on event day 0; the dependent variable $CAR_{j(-1,+1)}$ is the cumulative abnormal return for stock j during event window (−1, +1); γ_j^A and γ_j^{CAR} are constants; δ_j^A and δ_j^{CAR} are parameters that measure the sensitivity of the abnormal return of stock j to a characteristic of the endorser or firm; X_{j0}^A and X_{j0}^{CAR} are variables (dummy[13] or regular) that represent characteristics of the endorser or firm at event day 0; φ_j^A and φ_j^{CAR} are error terms.

Further, we assume that early information leakage may occur. Celebrity endorsement announcements may be known to some investors or rumors thereof may exist before the official announcement is made. To assess the likelihood of this scenario, we use the program Eventus to conduct an abnormal trading volumes test on the sample. This trading volumes test suggests that early information leakage does indeed occur in our sample. We also find some evidence of incomplete impounding of information into prices on the event day.[14] Therefore, we do not limit

[13] Following normal practice, the dummy variable takes value 1 to indicate the presence of a certain characteristic, and otherwise it takes value zero. When testing for the match-up hypothesis however, the dummy takes one of three values: one when congruence is assumed, minus one when incongruence is assumed, and zero otherwise.

[14] To save space, we do not report the detailed results. These are available from the corresponding author upon request. The idea behind this approach is that an early leak of news would generate an early increase in trading volumes. Our results confirm the presence of such an effect for the day before the announcement date. We find that the average abnormal trading volumes are significantly positive one day before the event day according to both the Patell test and the Rank test. Abnormal trading volumes are also significantly positive at the event day. Moreover, they are also positive on the first day after the event day, which may be an indication that not all news is fully digested at the announcement date. The reason may be that event announcements reported in newspapers typically lag corporate press releases by 1 day. However, this elevated trading effect on the first day after the announcement is not significant. Interestingly, abnormal trading volumes are not significantly different from zero any other day within the first week before or after the announcement date. The trading volume effect thus is short-lived in our sample.

the regression tests to the announcement date abnormal returns only but report the cross-sectional regression results for the time window (−1, +1) cumulative abnormal returns as well. Table 3 shows the estimation results.[15]

For nine of the total 11 regressions, we find that the T-statistics are insignificant at the 10% level for both the event day abnormal returns A_{j0} and the cumulative abnormal returns in the (−1, +1) window $CAR_{j[-1,+1]}$. Apparently, most of the characteristics are not consistently related to the occurrence of abnormal returns. We find weak support of the match-up hypothesis, with statistical significance limited to a 10% level only. One potential reason for the lack of significance is that the remaining sample of endorsements (thus excluding the most congruent ones) contains also the moderately incongruent ones. If a moderate incongruence is indeed beneficial, as suggested in Lee and Thorson (2008), it will be accompanied by a higher abnormal return. Therefore, the remaining sample's average abnormal return will be higher as well. As a result, it is difficult to distinguish between the abnormal return averages of the most congruent endorsements and the remaining sample. We interpret this finding as the stock market not reacting strongly to congruence or incongruence between a celebrity and an endorsed product.

Finally, we document that endorsements of technology industry products generate significant positive abnormal returns.[16] This finding is in line with the positive abnormal returns found by Clark et al. (2002, 2009) for sponsorship announcements. Our results thus provide further support for the notion that technology products may benefit relatively strongly from endorsement or sponsoring marketing communication strategies.

6 Concluding remarks

Surprisingly, given the substantial amounts of money spent by companies on celebrity endorsements (10% of total advertising budgets, see Agrawal and Kamakura 1995), the prior research on the effects of celebrity endorsement announcements on the market value of the firm, measured by the announcement-day returns, have been generally mixed.

Using a recent sample of endorsement announcements, we document that the companies announcing celebrity endorsements do not experience positive abnormal returns. The market, on average, anticipates the net discounted cash flow to be close to zero, implying that benefits of a celebrity endorsement match their costs. While many studies outline the positive aspects of celebrity endorsements, such as increased attention, image polishing, or brand repositioning, marketing literature does recognize a number of potential hazards in the use of endorsements. These hazards include the celebrity overshadowing the brand, the potential for public

[15] To save space we do not report the estimates of the constants γ_j^A and γ_j^{CAR}. They are all insignificant at the 5% level.

[16] As a robustness test, we ran regressions on standardized (instead of raw) cumulative abnormal returns as well. The results are qualitatively very similar: The estimate of the match-up dummy remains significant at the 10% level, and all other parameter estimates remain insignificant. As a further robustness test, a Kolmogorov–Smirnov test was conducted. It shows that normality of the return distribution can not be rejected.

Table 3 Impact of endorser and firm characteristics on abnormal returns

Independent variable	Predicted sign	Variable type	Panel A: A_{j0}		Panel B: $CAR_{j(-1,+1)}$	
			δ_j^At	T-Stat.	δ_j^At	T-Stat.
Gender	0	Dummy	−0.21	−0.63	−0.03	−0.04
Group	+	Dummy	−0.19	−0.31	0.66	0.56
Athlete	+	Dummy	−0.36	−1.07	−0.21	−0.31
Multiple endorsee	−/−	Dummy	0.07	0.20	0.99	1.36
Multiple endorser	+	Dummy	0.07	0.16	−0.23	−0.26
In major newspaper	+	Dummy	−0.33	−0.82	−0.11	−0.13
Size (market value)	+	Regular	−0.12	−1.48	−0.10	−0.63
Price/Book Ratio	+	Regular	−0.03	−1.13	−0.06	−1.17
Age of endorser	0	Regular	−0.45	−0.35	−1.42	−0.55
Technology sector	+	Dummy	1.47	2.11[b]	2.05	1.46
Match-up	+	Dummy	0.25	0.67	1.25	1.73[a]

The table presents the coefficients of 11 cross-sectional ordinary least squares regressions of event day abnormal returns (A_{j0}, panel A) and cumulative abnormal returns in the (−1, +1) window ($CAR_{j(-1,+1)}$, panel B) on various characteristics of the endorser or the firm. Independent variables are defined in the text. Finally, the predicted sign column shows if, based on the discussion in Section 5, the relationship between the abnormal returns and the independent variable is expected to be positive (+), negative (−/−), or mixed (0)

[a] Statistical significance at the 10% level

[b] Statistical significance at the 5% level

controversy,[17] and the loss of public recognition, not to mention the sheer expense of a major celebrity endorsement campaign. Our results seem to indicate that these potential hazards might in some cases offset positive aspects in terms of stock price behavior.

We also investigate the impact of certain characteristics of endorsers (gender, sports affiliation, etc.), firms (market value and price-to-book ratio) and announcements themselves (major newspaper or not) on abnormal returns. While most of the characteristics are not significantly related to announcement-day returns, firms in the technology sector experience positive returns, supporting the arguments of Biswas et al. (2006) and Clark et al. (2002, 2009). However, despite an array of previous studies documenting the importance of endorsers' characteristics, our data lends only weak, albeit positive, support for the match-up hypothesis between the celebrity and the endorsed product.

As a venue for future research, it could be worthwhile to investigate how investors use the actual expenditure of the celebrity endorsement campaign in their assessment of its net value. For some endorsements, the contract costs are disclosed to the public which allows for an empirical analysis. Such a study may help to answer the question if perhaps the market price for celebrity endorsers has increased too far in recent years. Agrawal and Kamakura (1995) found a positive announcement return but already forewarned of decreasing returns associated with

[17] Louie et al. (2001) document that the endorsed firm witnesses negative stock returns when blameworthy endorsers are involved in undesirable events.

using celebrities in advertising. Moreover, they referred to rising costs, the risks, as well as negative survey results. Our insignificant return results suggest that celebrity endorsement fees, as well as other costs of celebrity endorsement campaigns, have continued to increase since their study and now indeed may have become excessive. A deeper analysis of the importance of the actual price paid, possibly in relation to the size of the contracting firm and its advertising budget, is likely to further improve our understanding of the true economic value of celebrity endorsements.

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