

Celebrity Endorsements, Firm Value and Reputation Risk: Evidence from the Tiger Woods Scandal

Christopher R. Knittel and Victor Stango*

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Abstract

We estimate the stock market effects of the Tiger Woods scandal, on both his sponsors and their competitors. In the ten trading days after the beginning of the scandal, firms with products endorsed by Woods suffered significant declines in stock market value, relative to both the entire stock market and a set of competitor firms. The top five sponsors (Accenture, Nike, Gillette, Electronic Arts and Gatorade) lost 2-3 percent of their aggregate market value after the accident, and his core three sponsors EA, Nike and PepsiCo (Gatorade) lost over four percent. At least some sponsors' losses were competitors' gains, suggesting that endorsement deals are partially a business-stealing strategy. However, competitors who are themselves endorsement-intensive fared relatively worse than those who are not endorsement-intensive. It appears that the scandal sent a negative market-wide signal about the reputation risk associated with celebrity endorsements.

*Thanks to Anson Soderbery for fast and thorough research assistance. *Knittel*: Department of Economics, University of California, Davis, CA and NBER. *Email*: crknittel@ucdavis.edu. *Stango*: Graduate School of Management, UC Davis. *Email*: vstango@ucdavis.edu.

1 Introduction

As of mid-2009 professional golfer Eldrick ‘Tiger’ Woods earned roughly \$100 million annually in endorsement income, an amount far greater than that earned by any other athlete. On November 27, 2009, Mr. Woods was involved in a car crash outside his home. Following the crash, a series of news reports about both the crash and Mr. Woods’ personal life damaged his public reputation, and several sponsors either stopped featuring him or dropped him outright. In this paper we estimate the stock market effects of the scandal, for both the sponsor firms and their competitors. Some of those competitors are themselves “endorsement-intensive” (but have no contract with Tiger Woods), while others have no celebrity endorsement deals.

Our empirics touch on several key questions about celebrity endorsements, firm value and business strategy. Do firms capture value from investing in celebrity endorsements? If sponsors experience gains, do those gains represent net market value creation, or business-stealing from other firms? And, does the stock market reflect the “reputation risk” that firms take on by attaching brand value to celebrity sponsors? Previous work has touched on all of these these questions, finding evidence that is somewhat mixed. But our empirical setting has some unique advantages relative to other studies of celebrity sponsorship and stock market value, and allows us to shed new light on these issues.

Our first empirical finding is that between the car accident and Mr. Woods’ announcement ten trading days later of an ‘indefinite leave’ from golf, his sponsors’ market value declined by over two percentage points. We estimate these effects using an event study approach that is standard in marketing, economics and finance, and that has been used in previous studies relating firm value to celebrity endorsements.¹ Our event study method measures losses relative to the stock market overall, and also relative to competitor firms in the sponsors’ primary industries. Narrower groups of firms with the biggest endorsement contracts, or that had made large complementary investments in the “Tiger brand” lost more in percentage terms.

We also estimate stock price changes for sponsors’ competitors. We find that as sponsors lost value, their competitors gained value. More compelling is that these gains seem to accrue only to competitors that are themselves *not* heavily invested in celebrity endorsements. On the other

¹See Mackinlay (1997) and Johnston (2007) for surveys. The latter paper summarizes the literature relating endorsements to stock market value.

hand, the subset of sponsors' competitors with at least one celebrity endorsement deal experienced no gains at all.

In the context of prior work linking stock market value to celebrity endorsements, our first result provides clear evidence that in this case, endorsements generated substantial value for sponsor firms. The losses that we measure represent lost stock market value initially created through the Tiger Woods endorsement deals. Previous work estimating links between endorsements and stock market value has found mixed results. Nearly all of that work uses initial endorsement announcements to estimate gains in firm value, while we use negative news to measure the possible downside of endorsements.²

A corollary of our result is that endorsement deals carry downside risk. While we cannot compare the losses sustained by sponsors to their initial gains, the losses we measure are large. That suggests taking a view of celebrity endorsement as a risky investment rather than a simple short-run cost-benefit tradeoff - particularly if a firm plans to complement the endorsement deal with co-investment in a new product or brand, as Nike did with its golf line, and as Electronic Arts and Gatorade did with their "Tiger-specific" products.

Our finding that sponsors' losses are competitors' gains is fairly novel in the context of previous work. We are aware of one previous study (Mathur et al, 1997) examining competitors' returns after Michael Jordan's announced return to professional basketball, but that study finds "only very weak evidence" of a link between an endorser's behavior and competitors' stock market value. The upshot of that finding is that business strategy should incorporate information about competitors' endorsements when projecting future profitability.

Finally, the difference in competitors' returns when we stratify their "endorsement-intensity" is new evidence that markets price the reputation risk associated with celebrity endorsements. The relatively more negative returns for competitors with many celebrity endorsements - but no direct link to Tiger Woods - suggests that the scandal changed market-wide perceptions of risk associated with investments in celebrity endorsement. In the conclusion, we discuss that point in more detail.

²Louie et al. (2001) is a notable exception. We discuss that work below.

2 Celebrity Endorsements and Firm Stock Market Value

Celebrity product endorsements, and endorsements by professional athletes in particular, are a critical element of brand strategy.³ The key question from a firm’s perspective, of course, is whether a celebrity endorsement generates value sufficient to offset its possibly considerable cost. Another dimension of celebrity endorsements is risk - as with any investment, there is a chance that an endorsement deal will not pay off, either because a firm initially underestimates the true gain associated with endorsement, or because the added value of the celebrity endorser falls. A forward-looking firm would consider the latter “reputation risk” when evaluating a possible endorsement deal.

Stock market-based studies provide one window into measuring the returns associated with endorsements. A firm’s stock price reflects the discounted value of its expected future economic profits. If retaining a valuable endorsement increases that discounted value, then an announcement of celebrity endorsement should generate a “kick” in the stock price. Conversely, an adverse (endorser reputation-damaging) event or the departure of a valuable endorser might degrade firm profitability, which should result in a lower stock price.

Beyond that straightforward intuition, there is nuance to the stock market-based method of measuring returns from endorsements. Stock prices reflect changes in expected *profit* rather than sales or market share. Given that endorsement incurs expenses, it is possible that a celebrity endorsement might reduce profit even as it sparks sales or growth. Put more formally, celebrity endorsements generate economic rents, and the terms of the endorsement deal divide those rents. It is possible that celebrities might bargain away all of the rents that they generate for their sponsors, making sponsorship at best a break-even proposition. On the other hand, higher stock market prices for sponsors indicate that the firm has captured some of the economic rents generated by the endorser/firm partnership. The key question for a firm, then, is whether it is possible (or perhaps likely on average) that firms can capture rents generated by celebrity endorsements.

Another point worth mentioning is that changes in *expectations* drive changes in stock prices. That makes it much harder to measure changes in firm value following well-anticipated events. If, for example, a celebrity endorsement deal is widely anticipated long before its formal announcement, the sponsor’s stock price will have fully priced all of the gains associated with the deal well before the

³See, e.g., the many references in Ding et al. (2009), and an earlier survey by Erdogan (1999).

announcement itself, and examining stock price movements around the actual announcement would understate the gains associated with the endorsement deal. This also means that the empirically cleanest type of event to use for quantifying changes in firm value is an event - good or bad - that surprises the stock market, because surprises by definition avoid the anticipation problem.

These issues aside, a good deal of research has used stock market prices to estimate the value of celebrity endorsements and corporate sponsorship of sporting events. Most of these studies focus on athletes, who are the most visible celebrity endorsers, and estimate the gains associated with announcements of endorsements or sponsorship. In one study that bears directly on the topic we study in this paper, Farrell et al. (2000) find that Tiger Woods' endorsement deal announcement and tournament wins generated stock market value for Nike. Fizel et al. (2008) find evidence that golf endorsement deal announcements generate positive stock market returns. Mathur et al. (1997) find that Michael Jordan's return to professional basketball generated positive returns for his sponsors. Agrawal and Kamakura (1995) find that celebrity endorsements generate positive stock market returns for a wide set of celebrities. Mishra et al. (1997) find positive stock market effects of corporate event sponsorships. Miyazaki and Morgan (2001) and Samitas et al. (2008) find that Olympic sponsorship generates positive stock market returns for sponsor firms. Pruitt et al. (2004) find that NASCAR sponsors experience large stock market gains. All of this work paints a picture of celebrity endorsements and corporate sponsorships as value-enhancing investments.

On the other hand, some of the work just mentioned, and some other work, offers more mixed or negative findings. Farrell et al. (2000) find no link between endorsement deal announcements for Tiger Woods and stock prices for American Express or Fortune (Titleist). Fizel et al. (2008) find that "conventional stars" generate no stock market gains for their sponsors. Farrell and Frame (1997) find negative returns for Olympic sponsors (for a different year than that examined by Miyazaki and Morgan [2001]). Clark et al. (2009) find that bowl game and tennis/golf tournaments generate no gains, although they affirm the benefits of NASCAR sponsorship. Cornwell et al. (2001) find mixed evidence, with a good fit between sponsor and event leading to more positive stock market returns. Ding et al. (2009) find no significant gains for sponsors, with the exception of those in technology-related industries.

One study examines stock price changes following announcements of "bad news" for celebrity endorsers (including athletes and entertainers).⁴ Louie et al. (2001) find, perhaps counter-intuitively,

⁴That paper also adds to an interesting set of studies asking how negative information about an endorser affects

that bad news with little “culpability” for the endorser (such as a career-ending injury) generates gains for sponsors, while bad news with more culpability (such as a DUI arrest) generates losses.

Viewed as a whole, most prior work finds evidence linking stock prices to celebrity endorsements, but that evidence is by no means unequivocal. We suspect two forces at work. One is the inherent difficulty in estimating stock price responses to specific events - a difficulty that is only augmented given that many endorsement deals may be at least partially anticipated, and therefore priced, before their formal announcements. Another possibility is that while some firms may capture rents when they sign celebrity endorsers, others may not. Some celebrities may command payments that completely offset any incremental profit generated for the sponsor firm. And, some firms may simply overestimate the gains associated with an endorsement deal.

In the context of those issues, our case has some advantages and disadvantages. One advantage is that the event we examine certainly represented a surprise. Before the accident, Tiger Woods was widely acknowledged to have the most valuable “brand” of any athlete in the world - a fact accruing both from his athletic success and from his clean public image. Until 2009 he routinely placed in the top 5 of the Forbes “Celebrity 100” list of most influential celebrities world-wide. So our setting is certainly one in which stock prices might plausibly reveal the economic object of interest, because there is no evidence that the market anticipated any of the bad news associated with the scandal.

The flipside of that, and a limitation of our approach, is that while our method can estimate by how much sponsors’ expected future profits fall after the scandal, it cannot estimate the gain in expected future profits that firms initially experienced from the endorsement deal - although the losses that we estimate are plausibly a lower bound on the initial gains.

Another benefit associated with our example is that Tiger Woods endorses several products rather than just one. This allows us to estimate stock market effects across a wide set of otherwise unrelated firms, and gives us more statistical power than one would have if the estimates were confined to a single sponsor firm. In this respect, our work follows that of Farrell et al. (2000) and Mathur et al. (1997). Comparing returns for many sponsors associated with a single endorser can shed light on the circumstances in which endorsement deals are profitable for firms.

Finally, we augment our analysis by collecting data for a wide set of competitors to Tiger Woods’ sponsors. These data are useful in several ways. They allow us to control for industry-brand perception and firm value. See, e.g., Till and Shimp (1998).

specific factors affecting sponsors' stock prices, because to the extent that competitors and sponsors share industries those factors should also change stock prices for competitors.

More important, our competitor stock price data allow us to estimate whether sponsors' losses after the scandal are competitors' gains. Whether that is true depends on substitutability between sponsors' products and competitors' products, and the extent to which celebrity endorsement creates new demand, or merely steals business from competitors. Understanding whether celebrity endorsement is business-stealing or pure value creation is important both conceptually and for business strategy, but there has been very little empirical work examining the question. One notable exception is the work by Mathur et al. (1997), who find that competitors to Michael Jordan's sponsors experience "very weak" stock price changes after Jordan's return to professional basketball.

Finally, the dramatic nature of this particular scandal - an extremely damaging set of events for the world's leading endorser - allows us to examine the general role of "reputation risk" in determining firm value for endorsement-intensive firms in general. Long-term endorsement deals expose firms to risk - both downside risk associated with endorser scandals, and upside risk associated with improvements to an endorser's added value. That risk, like any other risk, should be priced by the stock market. Following the Tiger Woods scandal, the media devoted substantial attention to that risk. One can argue that the scandal in fact alerted the market to precisely how important reputation risk can be for endorsement-intensive firms. For example, a Google search for "celebrity reputation risk" yields stories largely written about Tiger Woods after the scandal. There is also evidence of a market response, by insurance companies offering protection against celebrity reputation risk; a New York Times article written January 31, 2010 was titled "Insuring Endorsements Against Athletes Scandals," and stated this:⁵

In the wake of the Tiger Woods scandal, insurers are being inundated with inquiries from corporations seeking to protect their investments, their brands and even their sales when their celebrity endorsers suffer public embarrassment...In a new wrinkle, more companies are trying to insure against the potential loss of sales when an athlete product endorser is involved in a scandal.

We explore this idea by estimating post-scandal stock price changes for two subsets of sponsors' competitors: those who are themselves endorsement-intensive, and those who are not endorsement-

⁵<http://www.nytimes.com/2010/02/01/sports/01insurance.html>.

intensive. If the scandal sent a market-wide signal about reputation risk, one might expect that risk to affect stock prices for all endorsement-intensive firms, even those who do not have Tiger Woods as an endorser.

3 The Endorsement Deals of Tiger Woods and the Scandal

Prior to November 2009, Tiger Woods' annual endorsement income was estimated to be roughly \$100 million, a figure roughly twice as large as that for any other athlete.⁶ We are able to identify seven publicly owned, domestically traded companies with which Tiger Woods had an endorsement or sponsorship deal as of November 27, 2009. We list those companies in Table 1.⁷ While the details of most contracts are private, the five most valuable contracts are seemingly with Accenture, Gillette, Nike, PepsiCo (Gatorade) and Electronic Arts (EA).⁸ Those five deals generated approximately \$80-90 million in annual income prior to the scandal. In the empirical work below, we estimate some stock price effects for this subset of "Big Five" firms.

It is also worth making one other distinction between sponsor firms. Some sponsors augment the endorsement relationship by making complementary co-investments in new products, the value of which might also be tied to the endorser's reputation. There are three such firms in our sample. Nike has a considerable complementary investment in the Nike golf product line, which did not exist prior to the Tiger Woods endorsement contract. Electronic Arts sells the "EA Tiger Woods" line of video games, and recently launched a new "Tiger Woods Online" video game. Gatorade invested considerable resources in developing a "Tiger Focus" drink.⁹

We draw this distinction because for firms with such co-investments in products linked to the "Tiger brand," there may be a tighter link between reputation risk and firm value. Developing and marketing a new product line requires a considerable up-front investment, as well as substantial production and marketing costs. The Nike golf line, for example, is a brand with considerable asset

⁶<http://sportsillustrated.cnn.com/more/specials/fortunate50/2009/>.

⁷See <http://web.tigerwoods.com/sponsors/sponsors> for a complete list. Some of the companies on that list are either privately held, or traded on foreign exchanges; we do not track those companies.

⁸See <http://industry.bnet.com/advertising/10005016/the-tiger-woods-sponsor-deathwatch-at-nike-digs-in-heels/> for details.

⁹Gatorade announced the discontinuation of the Tiger Focus drink two days before the scandal began. It is difficult to know whether the decision was affected by the scandal, but to be conservative we treat Gatorade as having a complementary investment associated with the Tiger Woods endorsement deal.

value, accumulated via Nike’s substantial up-front and ongoing investment in R&D, physical capital and brand equity. So, for firms with such complementary investments, changes in stock prices will reflect changes in the value of those assets, as well as changes in direct sales associated with the endorsement deal. So, in the empirical work below we estimate stock price effects for the “Big Three” of Nike, Electronic Arts and Gatorade: the set of firms with substantial complementary investments associated with Tiger Woods.

3.1 The Timeline of the Scandal

The scandal began with a car crash on the evening of November 27, 2009 - a Friday, meaning that the first trading day after the release of “bad news” is Monday November 30, 2009. After the initial accident, several possibly reputation-damaging pieces of information emerged, culminating ten trading days later (December 11, 2009) with Tiger Woods’ announcement on that date of an ‘indefinite leave’ from golf.¹⁰ Any of the information released between those two dates may have reduced Mr. Woods’ current value to endorsers, reduced the value of complementary assets linked to the “Tiger brand,” increased uncertainty about the future value of those assets and Tiger Woods as an endorser, and sent a signal about the magnitude of “reputation risk” for endorsement-intensive firms.

While there is of course no way to immediately quantify the sum effect of all of these things, it seems plausible that they affected the value accruing to sponsors from endorsement deals - most notably, because several sponsors either dropped Tiger Woods outright or distanced themselves from him. On December 13, 2009 Accenture cancelled its endorsement deal. On December 31, AT&T cancelled its sponsorship deal with Woods. Even the sponsors that retained Woods - Nike, for example - re-oriented television and print advertising away from Tiger Woods-specific images after the scandal.

4 Estimated Stock Market Effects of the Scandal

To estimate shareholder losses for the set of sponsor firms following November 27 2009, we estimate an event study. Our method is standard in marketing, economics and finance, and as we discuss above has been employed extensively in studies linking stock market value to celebrity endorsements.

¹⁰For a timeline, see <http://www.montrealgazette.com/sports/timeline+Tiger+Woods+decline/3374668/story.html>.

Our primary specification is:

$$R_{it} = \alpha_i + \beta_i^m R_t^m + \beta_i^c R_{it}^c + \sum_s \delta_s D_{st} + \epsilon_{it}, \quad (1)$$

where,

- R_{it} = the return on shares of sponsor i at time t ,
- R_t^m = the return on the Dow Jones value-weighted total market index at time t ,
- R_{it}^c = the return on shares of sponsor i 's competitors at time t ,
- δ_s = the abnormal return on day s after the accident,
- D_{st} = a dummy variable equal to one during day s after the accident,
- ϵ_{it} = an error term.

The specification is a standard market model where dependent variable is a sponsor's daily percentage return exclusive of dividends, from Wharton Research Data Services and the Center for Research in Stock Prices (CRSP). The controls are the value-weighted total market return and a value-weighted competitor portfolio return. The competitor portfolio includes the first ten firms listed by Google Finance as "competitors."¹¹ The model allows for sponsor-specific daily mean returns (alphas) and correlations with market/competitor returns (betas). The data begin on January 1, 2005 and extend to December 31, 2009. We omit observations for the thirty trading days preceding November 27, 2009 (the day of the accident). Including them does not change the results, and we find no evidence of pre-event abnormal returns. Event date "one" is November 30, the first trading day after the accident (which occurred after the close of trading on November 27).

Our model yields estimates of daily abnormal returns, δ_s , which are deviations of actual returns on the days after the scandal from those predicted by the model. We weight observations by market capitalization, effectively estimating the abnormal returns that one would experience by holding a value-weighted portfolio of Tiger Woods' sponsors. We also estimate cumulative abnormal returns (CARs) - which are running cumulative sums of the daily abnormal returns - starting on November 30th. The CARs estimate sponsors' total loss over a multi-day window starting on event date one, relative to the market and competitor returns. We use Salinger's (1992) procedure for calculating standard errors on the cumulative abnormal returns; that procedure accounts for the

¹¹We have estimated the model using the first five or three competitors, and also using the Yahoo! Finance competitor list. Varying the specification of competitors' returns has no effect on the results.

contemporaneous correlation of sponsor-specific errors on the same day. In the results below we report abnormal returns and CARs for windows extending up to fifteen trading days after the car accident.

In some cases we estimate a more flexible specification that allows abnormal returns to vary across firms within the same day:

$$R_{it} = \alpha_i + \beta_i^m R_t^m + \beta_i^c R_{it}^c + \sum_{is} \delta_{is} D_{st} + \epsilon_{it}, \quad (2)$$

This more flexible specification allows us to conduct non-parametric sign and rank tests regarding the post-event abnormal returns. Both are tests against the null hypothesis that post-event abnormal returns are centered on zero. That is what one would expect if the post-event period contained no systematic news about firm value. Rejecting the null suggests that some (either positive or negative) information affected sponsor firms' returns.

During the event period there is one earnings announcement, by PepsiCo (the parent of Gatorade), on December 9th. We discuss the results in the context of this possibly confounding factor below. Another confounding factor is that the smallest sponsor, TLC Vision, filed for bankruptcy on December 21, 2009. That turns out not to matter much because TLC's weight in the portfolio is trivially small, but it is worth noting. If one weights the portfolio equally, the returns for portfolios including TLC become more negative after the scandal - but that probably reflects the spurious influence of TLC's imminent bankruptcy (which seems well-anticipated by the market, based on its stock price leading up to December 21). That makes using a value-weighted portfolio (or focusing on the Big Five/Three) more attractive conceptually.

4.1 Primary Results

Table 2 shows estimates of cumulative abnormal returns (CARs) for all sponsors, for the Big Five only and for the Big Three only. For the full group of sponsors, the point estimates are negative by the 10-day and 15-day horizons, but are not statistically significant. For the sub-groups, the percentage declines are bigger, and statistically different from zero. In the Big Five subsample the 10-(15-)day CAR shows a loss of 2.6%(3.4%), and in the Big Three subsample the 10-(15-)day CARs show a losses of 4.0%(4.8%). The Big Five CARs are statistically significant at 10% or better, and the Big Three CARs are statistically significant at 5% or better.

The pattern of percentage declines across the sub-groups makes sense. The full group number is the lowest, because it includes firms with relatively small involvements with Mr. Woods. The Big Five have greater involvements, and we see that they suffer more damage. And, the sponsors with the greatest complementary investments in the “Tiger brand” suffer the most.

Figure 1 provides more detail on the pattern of losses over time. It shows the cumulative abnormal returns for these groups over the entire period from November 30 to December 16. One interesting feature of the losses is that they do not occur immediately. That suggests that information about the downside of the scandal for sponsor firms leaked gradually. The losses do appear to accelerate leading up to the announcement on December 11 of Mr. Woods’ leave from golf, and then stabilize - after that date, the CARs neither grow nor dissipate substantially.

Table 3 shows daily abnormal returns and presents the results of the sign and rank tests. The main body of the table shows daily abnormal returns for each of our main sponsor groups in the first three columns. These abnormal returns are the individual δ_s coefficients, which are averaged across firm (weighted by firm value). Shaded cells show negative values for these coefficients: of the forty-five daily abnormal returns in the first three columns, 31 (69%) are negative.

The bottom four rows use the firm-specific daily abnormal returns (not shown in the table) to conduct both sign and rank tests over 10-day and 15-day windows. Again, the null hypothesis in these tests is that returns are centered on zero. The alternative (one-tailed) hypothesis in each test is that the returns are centered on a negative value, indicating the systematic release of negative information affecting all firms. The sign test uses only information about the sign (positive or negative) of each coefficient, while the rank test uses information about both signs and magnitudes.

For the full sponsor group, the p-values for both sign tests are below 0.10, and are below 0.10 for the rank test over the 15-day window. Results for the subsamples are more significant. For the Big Five, all of the p-values fall below 0.05, and for the Big Three both 10-day test p-values fall below 0.01. In all, these results provide strong evidence that returns after the scandal are systematically negative, particularly for the Big Five/Three groups.

The last two columns shed further light on whether the PepsiCo negative earnings revision on December 9, 2009 contaminates our results. One might worry about that based on the fact that December 9 is the eighth day after the event, and is the day on which the daily abnormal returns are most negative. In the fourth and fifth columns of Table 3, we break our ‘Big Three’ subsample

of EA, Nike into two groups: PepsiCo and the other two firms. The abnormal return for PepsiCo on December 9 is indeed negative and significant (-2.9%), but so are abnormal returns for the other two firms (-2.4%), and the point estimates are very close. While one cannot rule out a negative stock price effect of the announcement, the pattern of results is consistent with the release on December 9 of bad news common to Nike, EA and PepsiCo. What’s more, the p-values for the sign and rank tests using only EA and Nike returns are both close to 0.01 over the 10-day window, and are much larger for PepsiCo, which experienced several fairly large positive returns, and the only significantly positive abnormal return in the group. That evidence suggests that if anything, the inclusion of PepsiCo pushes against the overall results. One can see that even more clearly in Figure 2, which shows CARs for the Big Three as a group, and also for Nike, EA and PepsiCo individually. CARs for Nike and EA are negative immediately following the accident and remain so over the entire 15-day event window, while PepsiCo experiences positive returns early on, then only turns negative later. Our choice to weight abnormal returns and CARs by value only pushes against our main results, because PepsiCo has by far the biggest market capitalization in the Big Three (note how closely the solid line in Figure 3 tracks PepsiCo’s CAR).

4.2 Competitor Returns and Endorsement Intensity

In this section, we examine returns for the set of competitors to our sponsors. For each of the seven firms in our sponsor sample we collect daily return data for ten competitors, meaning that we examine returns for as many as seventy competitors in the work below.¹² In some instances a competitor is itself one of our sponsors, in which case the competitor is discarded.

The model for this analysis is a standard market model:

$$R_{it} = \alpha_i + \beta_i R_t^m + \sum_s \delta_s D_{st} + \epsilon_{it}, \tag{3}$$

where,

- R_{it} = the return on shares of competitor i at time t,
- R_t^m = the return on the CRSP equally-weighted portfolio at time t,
- δ_s = the abnormal return for competitor i from day s after the accident,

¹²Some competitors move in or out of the sample during the estimation window, meaning that we do not always have data for all seventy firms.

- D_{st} = a dummy variable equal to one during day s after the accident,
- ϵ_{it} = an error term.

The specification is a standard market model, and identical to our previous specification but for the fact that we no longer control for competitors' returns, since the competitors' returns are now the dependent variable. The model is otherwise identical to that we estimate for sponsors. It allows for competitor-specific daily mean returns (alphas) and correlations with market returns (betas). We weight the returns by competitor value (market capitalization). We estimate competitors' returns for all competitors, as well as competitors to the Big Five/Three.

The first three columns of Table 4 shows ten-day CARs for the competitor sample. The general pattern is that competitors' CARs are positive, and rise as sponsors' returns fall - with the greatest changes occurring after day seven. The point estimates are more positive for the Big Five and Big Three, although only the CARs for the Big Five are significantly different from zero. This is weak evidence that overall, the set of competitors experienced stock market gains as the sponsors experienced losses.

The more interesting results are those in the next six columns, which distinguish between competitors with and without celebrity endorsement deals. We classify a competitor as "endorsement intensive" if a web search reveals that the competitor has at least one celebrity endorsement deal. This is probably conservative, in the sense that relatively few of these firms are as endorsement-intensive as the large sponsors that have Tiger Woods as an endorser.

The results in the last six columns suggest that competitors without endorsements fared much better, in a relative sense, than those with endorsements. For those firms, in the Big Five and Big Three subsamples the CARs are significantly different from zero over nearly any window beyond ten days. The pattern of magnitudes also corresponds to the pattern for sponsors - smallest in absolute value for the "all firms" group, larger for the Big Five subsample, and still larger for the Big Three subsample. In contrast, the last three columns show that CARs for competitors with endorsements are not significantly different from zero for any event window. The relative gains for competitors *without* endorsement deals suggest the losses for sponsor firms were at least in part gains for competitors - in other words, that celebrity endorsements transfer value across firms. But the fact that being endorsement-intensive was treated more harshly in the market suggests a second effect - that the scandal sent a negative market-wide signal, as suggested in the New York Times article above, about the possible downside of celebrity endorsements. For endorsement-intensive

competitors, the net effect of the business-stealing effect (a gain) and the reputation risk effect (a loss) appears to be a wash.

The overall pattern of results is summarized by Figure 3, which highlights the differences between our three groups of affected firms: sponsors, competitors with endorsement deals, and competitors without endorsement deals. The relative differences across the groups are economically meaningful; the scandal appears to have had far-reaching and substantive effects on a large set of firms.

5 Discussion and Conclusion

The Tiger Woods scandal provides a unique opportunity to understand more about the relationship between stock market value and celebrity endorsements. Our first result confirms a direct (and fairly thoroughly-investigated) dimension of that link: the market value of Tiger Woods' sponsors fell substantively after the scandal broke, relative to the market values of firms without such endorsement deals. Although that finding may not surprise everyone, it is informative in the context of the mixed evidence from previous work. It appears that the firms we examine were indeed able to capture some of the rents associated with the endorsement partnership - while we cannot measure the initial upside of the deals, our results probably provide a lower bound on those values.

Beyond that, we shed light on some less well-investigated aspects of the endorsement/stock price relationship. Firms with substantial co-investments in new products linked to the "Tiger brand" suffered greater declines in value, presumably reflecting declines in the asset values or brand equity associated with those products. This result highlights a further downside risk of pairing celebrity endorsements with endorser-specific investments in products or branding.

Our estimates of competitors' gains represent new evidence regarding how far-reaching the stock market effects of celebrity endorsements can be. Competitors to sponsor firms measurably gained value after the scandal, relative to the rest of the market. That finding has implications for business strategy, in that competitors' endorsement deals are one more factor affecting firm value. While we cannot quantify whether *all* sponsors' losses were competitors' gains, our findings do bear on a more philosophical point: it appears that celebrity endorsements transfer value, at least in part, rather than purely creating value.

Finally, the anecdotal evidence regarding how the scandal altered perceptions of celebrity endorsement reputation risk, in concert with our statistical evidence on how competitors fared based on whether they also had celebrity endorsers or not, suggests a regime change in how equity markets price reputation risk. Whether that regime change persists is an open question, but if insurance companies indeed start offering “reputation risk insurance” then that view will have passed a convincing market test.

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6 Tables

Table 1. Sponsors, Parent Companies, Endorsement Values and Market Capitalizations.

Sponsor	Parent Company	Endorsement value (/yr.)	Market Cap
Nike	Nike	\$20-30 million	\$32 Billion
Gatorade	Pepsico	\$20 million	\$95 Billion
Accenture	Accenture	\$20 million	\$26 Billion
Gillette	Procter and Gamble	\$15 million	\$179 Billion
Tiger Woods PGA Tour Golf	Electronic Arts	\$8 million	\$5.76 Billion
AT&T	AT&T	n/a	\$165 Billion
TLC Laser Eye Centers	TLC	n/a	\$4.04 Million

Notes: We include all sponsors for which we can obtain stock price data. Market cap values are as of mid-December 2009. AT&T's relationship with Woods involves sponsoring a golf tournament and charity events, in exchange for product placement (e.g., on Tiger Woods' golf bag.)

Table 2. Cumulative abnormal returns for sponsor firms.

Days after event	All Firms	Big Five	Big Three
One	-0.002 (0.004)	-0.002 (0.005)	-0.002 (0.006)
Two	-0.000 (0.006)	0.001 (0.006)	0.008 (0.009)
Three	0.001 (0.007)	0.000 (0.008)	0.004 (0.011)
Four	0.000 (0.008)	-0.006 (0.009)	-0.002 (0.013)
Five	0.003 (0.009)	-0.003 (0.010)	0.005 (0.014)
Six	0.009 (0.010)	-0.001 (0.011)	0.008 (0.015)
Seven	0.003 (0.011)	-0.006 (0.012)	0.001 (0.017)
Eight	-0.007 (0.011)	-0.016 (0.013)	-0.026 (0.018)
Nine	-0.008 (0.012)	-0.019 (0.014)	-0.030 (0.019)
Ten	-0.010 (0.013)	-0.026* (0.014)	-0.040** (0.020)
Eleven	-0.011 (0.013)	-0.025 (0.015)	-0.045** (0.021)
Twelve	-0.017 (0.014)	-0.031* (0.016)	-0.042* (0.022)
Thirteen	-0.019 (0.015)	-0.031* (0.016)	-0.044* (0.023)
Fourteen	-0.019 (0.015)	-0.031* (0.017)	-0.043* (0.024)
Fifteen	-0.022 (0.016)	-0.034* (0.018)	-0.048** (0.024)
Observations	8802	6295	3777
R-squared	0.530	0.497	0.497

Notes: Coefficients are cumulative abnormal returns (CARs) weighted by firm value, estimated using the model in equation (1). Event date is November 27, 2009. Standard errors are adjusted for contemporaneous correlation across firms. "All firms" include all listed in Table 1. "Big Five" includes Nike, EA, Accenture, PepsiCo (Gatorade) and P&G (Gillette). "Big Three" includes Nike, EA and PepsiCo.

Table 3. Daily Abnormal Returns for Sponsors.

Days after event	All Firms	Big Five	Big Three	Nike, EA	Pepsi
One	-0.002 (0.004)	-0.002 (0.005)	-0.003 (0.007)	-0.005 (0.013)	-0.002 (0.009)
Two	0.002 (0.004)	0.003 (0.005)	0.011* (0.007)	-0.007 (0.013)	0.016* (0.009)
Three	0.001 (0.004)	-0.001 (0.005)	-0.005 (0.007)	-0.007 (0.013)	-0.004 (0.009)
Four	-0.001 (0.004)	-0.007 (0.005)	-0.006 (0.007)	-0.004 (0.013)	-0.006 (0.009)
Five	0.003 (0.004)	0.003 (0.005)	0.007 (0.007)	-0.016 (0.013)	0.014 (0.009)
Six	0.006 (0.004)	0.002 (0.005)	0.003 (0.007)	0.003 (0.013)	0.003 (0.009)
Seven	-0.006 (0.004)	-0.005 (0.005)	-0.007 (0.007)	-0.005 (0.013)	-0.007 (0.009)
Eight	-0.011*** (0.004)	-0.010** (0.005)	-0.028*** (0.007)	-0.024* (0.013)	-0.029*** (0.009)
Nine	-0.001 (0.004)	-0.004 (0.005)	-0.004 (0.007)	0.005 (0.013)	-0.007 (0.009)
Ten	-0.002 (0.004)	-0.006 (0.005)	-0.010 (0.007)	0.006 (0.013)	-0.015* (0.009)
Eleven	-0.001 (0.004)	0.001 (0.005)	-0.005 (0.007)	-0.002 (0.013)	-0.006 (0.009)
Twelve	-0.007* (0.004)	-0.006 (0.005)	0.003 (0.007)	0.008 (0.013)	0.001 (0.009)
Thirteen	-0.001 (0.004)	-0.000 (0.005)	-0.001 (0.007)	-0.002 (0.013)	-0.001 (0.009)
Fourteen	-0.000 (0.004)	-0.000 (0.005)	0.000 (0.007)	-0.005 (0.013)	0.002 (0.009)
Fifteen	-0.003 (0.004)	-0.004 (0.005)	-0.005 (0.007)	0.014 (0.013)	-0.011 (0.009)
Observations	8802	6295	3777	2518	1259
R-squared	0.530	0.497	0.465	0.403	0.540
10-day sign test p-value	0.060	0.027	0.005	0.015	0.117
15-day sign test p-value	0.030	0.021	0.018	0.051	0.092
10-day rank test p-value	0.117	0.028	0.007	0.009	0.420
15-day rank test p-value	0.065	0.046	0.038	0.110	0.389

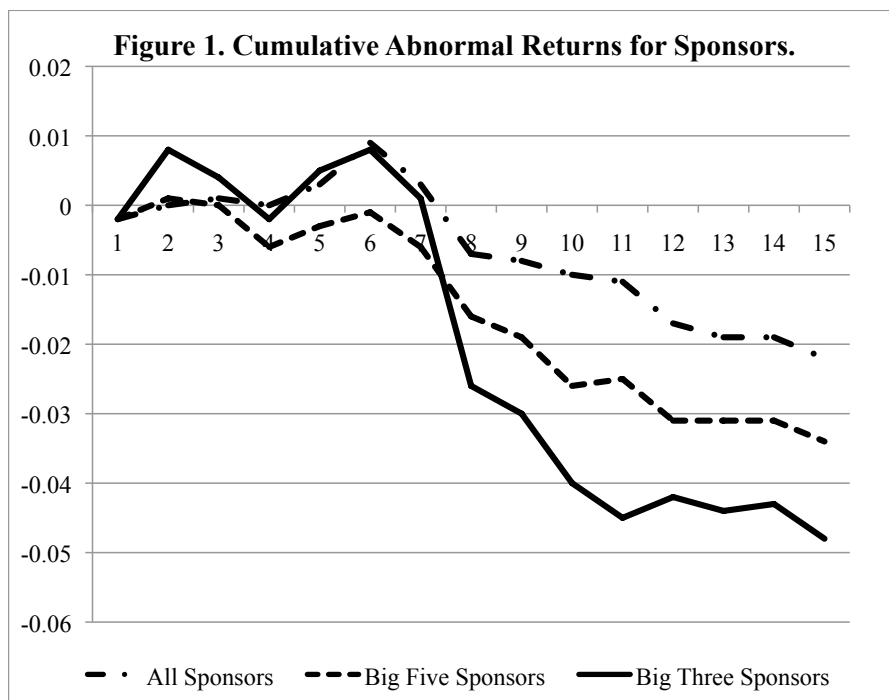
Notes: Coefficients are abnormal returns weighted by firm value, estimated using the model in equation (1). Event date is November 27, 2009. Standard errors are adjusted for contemporaneous correlation across firms. "All firms" include all listed in Table 1. "Big Five" includes Nike, EA, Accenture, PepsiCo (Gatorade) and P&G (Gillette). "Big Three" includes Nike, EA and PepsiCo. Shaded cells indicate negative values. Sign and rank tests p-values use the full set of firm-day-specific abnormal returns, estimated using the model in equation (2). For the sign and rank tests the null hypothesis is that returns are centered on zero.

Table 4. CARs for competitors, and for competitors by endorsement intensiveness

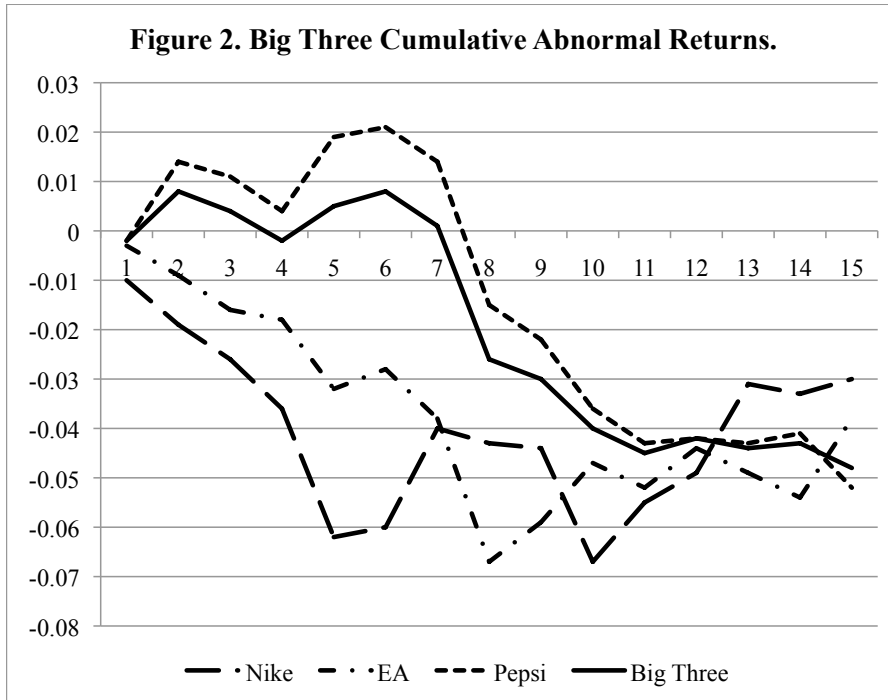
Days after event	All competitors			Not endorsement intensive			Endorsement intensive		
	All Firms	Big Five	Big Three	All	Big Five	Big Three	All Firms	Big Five	Big Three
One	-0.002 (0.002)	-0.001 (0.002)	-0.002 (0.003)	-0.007*** (0.002)	-0.004 (0.003)	-0.009* (0.005)	0.001 (0.003)	0.001 (0.003)	0.000 (0.005)
Two	0.001 (0.003)	0.005 (0.003)	0.006 (0.005)	-0.007** (0.003)	0.001 (0.004)	-0.006 (0.007)	0.006 (0.004)	0.006 (0.005)	0.009 (0.007)
Three	-0.003 (0.003)	0.001 (0.004)	0.000 (0.006)	-0.005 (0.004)	0.006 (0.005)	-0.008 (0.008)	-0.001 (0.005)	-0.001 (0.006)	0.002 (0.008)
Four	0.003 (0.004)	0.006 (0.004)	0.004 (0.006)	0.001 (0.005)	0.011** (0.005)	-0.004 (0.010)	0.005 (0.006)	0.004 (0.007)	0.006 (0.009)
Five	0.001 (0.004)	0.006 (0.005)	0.004 (0.007)	-0.003 (0.005)	0.013** (0.006)	0.003 (0.011)	0.003 (0.007)	0.003 (0.008)	0.004 (0.010)
Six	-0.002 (0.005)	0.003 (0.005)	0.004 (0.008)	-0.005 (0.006)	0.009 (0.006)	0.007 (0.012)	0.001 (0.008)	0.001 (0.008)	0.004 (0.011)
Seven	0.000 (0.005)	0.003 (0.006)	0.005 (0.008)	-0.004 (0.006)	0.005 (0.007)	0.004 (0.013)	0.003 (0.008)	0.002 (0.009)	0.005 (0.012)
Eight	0.007 (0.005)	0.006 (0.006)	0.007 (0.009)	0.005 (0.007)	0.006 (0.007)	0.009 (0.014)	0.008 (0.009)	0.006 (0.010)	0.006 (0.013)
Nine	0.009 (0.006)	0.011* (0.006)	0.013 (0.010)	0.008 (0.007)	0.017** (0.008)	0.026* (0.015)	0.009 (0.010)	0.008 (0.010)	0.009 (0.014)
Ten	0.007 (0.006)	0.010 (0.007)	0.013 (0.010)	0.007 (0.008)	0.020** (0.008)	0.030** (0.016)	0.008 (0.010)	0.006 (0.011)	0.009 (0.015)
Eleven	0.007 (0.006)	0.011 (0.007)	0.012 (0.011)	0.007 (0.008)	0.022** (0.009)	0.025 (0.016)	0.007 (0.011)	0.006 (0.011)	0.008 (0.016)
Twelve	0.007 (0.006)	0.013* (0.007)	0.015 (0.011)	0.004 (0.008)	0.023** (0.009)	0.032* (0.017)	0.008 (0.011)	0.008 (0.012)	0.011 (0.016)
Thirteen	0.007 (0.007)	0.013* (0.008)	0.014 (0.012)	0.003 (0.009)	0.023** (0.010)	0.035* (0.018)	0.009 (0.011)	0.009 (0.012)	0.008 (0.017)
Fourteen	0.003 (0.007)	0.009 (0.008)	0.006 (0.012)	0.002 (0.009)	0.022** (0.010)	0.033* (0.018)	0.003 (0.012)	0.003 (0.013)	-0.001 (0.018)
Fifteen	0.012 (0.007)	0.020** (0.008)	0.014 (0.012)	0.010 (0.009)	0.033*** (0.010)	0.028 (0.019)	0.012 (0.012)	0.013 (0.013)	0.011 (0.018)
Observations	62508	46530	25180	43321	28595	14691	19187	17935	10489
R-squared	0.437	0.454	0.470	0.407	0.452	0.477	0.461	0.457	0.470

Notes: Coefficients are CARs weighted by firm value, estimated using the model in equation (2). Event date is November 27, 2009. Standard errors are adjusted for contemporaneous correlation across firms. "Competitors" are the first ten firms listed by Google Finance for each sponsor firm - there are seventy competitors in all, although some have missing data during the estimation or event window. "All firms," "Big Five" and "Big Three" include competitors of each group. "Endorsement intensive" firms are those for which a Google search of the company name followed by "endorsement deals" yields information about at least one celebrity endorsement deal.

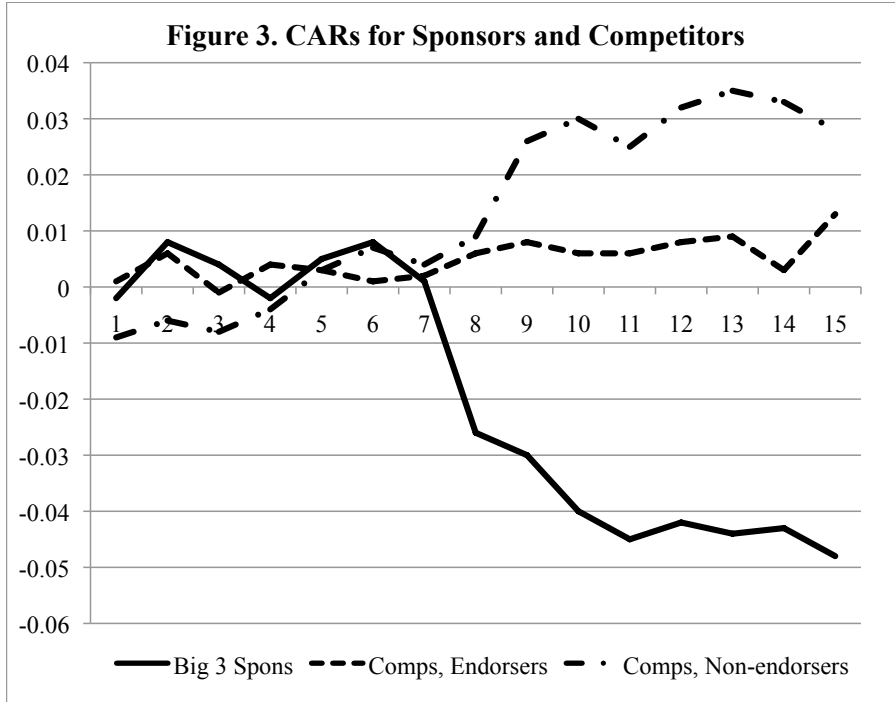
7 Figures



Notes: Figure plots the daily cumulative abnormal returns (CARs) from Table 2 for sponsor firms. "Big Five" includes Nike, EA, Accenture, PepsiCo (Gatorade) and P&G (Gillette). "Big Three" includes Nike, EA and PepsiCo.



Notes: Figure plots the daily cumulative abnormal returns (CARs) from the Equation 1 for the "Big Three" of Nike, EA and PepsiCo. Solid line shows the value-weighted average of the coefficients, and dotted lines show coefficients for the individual sponsors.



Notes: Figure plots the daily cumulative abnormal returns (CARs) for Big Three (Table , column 3), endorsement-intensive competitors ("Comps, Endorsers") to the Big Three (Table 4, column 6) and non-endorsement-intensive competitors ("Comps, Non-endorsers") to the Big Three (Table 4, column 9).