# Advertising Exposure and Portfolio Choice: Estimates Based on Sports Sponsorships*

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**Abstract**

Product market advertising by raising the awareness of a company's brand is thought to also increase the demand for a company's stock as well as its products. I construct a dataset of publicly traded sports sponsors in the US and develop an instrument for investor exposure to advertising via these sponsorships. I show that investors living in a city where local sports teams are sponsored by a given company, local or non-local, are more likely to purchase stocks in that company. The portfolio effects from sports sponsorship are large and suggest that advertising is more important than even local bias.

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# 1. Introduction

Where do households get investment ideas? Addressing this question is essential for understanding the portfolio choices of individuals, whether these refer to stocks, mutual funds or products of financial innovation.[1] *Product market advertising* is a widely discussed source for investment ideas, but with little empirical evidence. The premise is that the awareness of a firm's securities can be raised through the promotion of the firm's products. Thus, besides increasing product sales, which is its main objective, advertising can potentially also increase the retail investors' demand for a stock through a spillover effect (e.g., Grullon, Kanatas, and Weston (2004), Lou (2014))[2].

This paper seeks to contribute to the identification of the product advertising effect on the household portfolio, by utilizing account data from a large national discount broker in the United States in conjunction with a newly constructed dataset of publicly traded sponsors of teams in the four major league sports (i.e., NFL, NBA, MLB and NHL). In particular, the aim is to use micro-level retail investment data in order to study how product market advertising interacts with the acknowledged presence of locally biased equity preferences.[3] Most interestingly, the paper's final goal is an investigation of whether geographically distant firms can actually make households' stockholdings *less local* by sponsoring a sports team in the city where they live. The extent to which local firms can also attract further retail investment in the city where they are based, if they sponsor a local team, is examined too.

The biggest research challenge for Household Finance studies in advertising is the general unavailability of data on the exposure of investors to commercials. For instance, the advertising expenses from the account balance sheets of firms in Compustat (which are used

[1] See, e.g., Shiller and Pound (1989), Hong, Kubik, and Stein (2004), Barber and Odean (2008), and Bailey, Kumar, and Ng (2011).

[2] See also Fehle, Tsyplakov, and Zdorovtsov (2005), Chemmanur and Yan (2009), Keloharju, Knüpfer, and Linnainmaa (2012).

[3] Particularly for retail stock investment, the Household Finance literature has established the renowned channel of *local bias*, according to which equity portfolios of households are highly concentrated on firms with headquarters near their residence. See, e.g., Grinblatt and Keloharju (2001), Huberman (2001), Ivković and Weisbenner (2005), Massa and Simonov (2006), Feng and Seasholes (2008).

in many papers) are too crude to know which population in which local market is exposed to advertising. Additionally, in the US, there is lack of data on individuals' stock-holdings to begin with. As a result, the study of the typical American retail investor relies almost exclusively on the account data of the large discount broker that this paper uses.[4] Unfortunately, due to their age, these data cannot be merged with the more recent local advertising data from Nielsen or Kantar Media.[5]

But even with data on the local marketing activities, different forms of advertising (e.g., TV or radio commercials, street or mail advertising, etc.) have in general different effects. Notably, recent papers that study the household health insurance choice document a decreasing efficiency of media advertising (e.g., Aizawa and Kim (2015), Shapiro (2017)). This finding is not surprising, since in principle households do not enjoy watching commercials and try to skip them if they can.[6]

To overcome the above issues, in this paper, I measure advertising exposure with sports sponsorship. A well-accepted notion in Marketing is that sports teams offer the most suitable platforms in which firms can increase their visibility (e.g., Carter (1996), Ukman (2017)). Sports sponsorship is a form of advertising that is perceived to be less obtrusive by individuals, since it associates brands with the cause of supporting their team. According to a nationwide poll conducted by John Hancock Financial Services in 1993, up to 64% of a city's households "would think more favorably" of a company that sponsors their local team. In fact, the anticipated benefits from sports sponsorship are such that teams usually provide the basis for an integrated advertising campaign in a city. That is, rather than being a substitute, sports sponsorship can complement any other form of advertising.[7] As a result, even in the absence of advertising data in local markets, sports sponsorship can be used as a *sufficient statistic* for the increased overall marketing efficiency of a firm in a city.

[4]See Barber and Odean (2013) for a literature review.

[5]See, e.g., Madsen and Niessner (2016), Focke, Ruenzi, and Ungeheuer (2016), Hillert, Kunzmann, and Ruenzi (2017).

[6]See, e.g., Speck and Elliott (1997), Cho and Cheon (2004) .

[7]See, e.g., Meenaghan (2001), Carrillat and d'Astous (2012), Olson and Thjømøe (2009).

Based on the above remark, I employ a firm-city-specific indicator variable that equals one if the respective firm sponsors a team in the corresponding city. To construct this variable, I digitize the Sports Sponsor FactBook of Team Marketing Report, which allows me to see the sports marketing activities of primary sports sponsors in all cities. I am then able to compare the households' portfolio positions in their cities' team sponsors with their stockholdings in other firms. Since most sports sponsors are large firms, to make the comparison effective, I contrast them to other members of Russell 1000 (i.e., an index with the largest 1000 public companies based on market capitalization).

To provide a first perspective, Table 1 depicts the average allocation of the household portfolio on firms based on (i) how far away their headquarters are from the household residence and (ii) whether they sponsor a professional sports team in the city where the household lives. Column 3 in Panel A shows the standard local bias. On average, 21.1% of the household portfolio is invested in stocks whose headquarters are at most 100 miles away from the household residence. That portion is 14.7% in excess of the share according to the market (value-weighted) portfolio. At the same time, Row 3 shows that 11.7% of the portfolio is on average allocated on the team sponsors of a household's city. In fact, relative to the CAPM benchmark, there is an over-investment of 5.4%. Importantly, as Column 1 demonstrates, *the over-investment in sports sponsors cannot be absorbed by local bias.* That is, 24% of the advertising over-investment (i.e., 1.3% out of the 5.4%) is attributed to stocks with headquarters more than 100 miles away from the household residence. Even if the locality threshold is extended to 250 miles (in Panel B), stocks based further away continue to comprise 17% of the bias towards stocks that advertise (i.e., 0.9% out of 5.4%).

To capture the high degree of portfolio sparsity that retail investors exhibit (owning on average two to three stocks), I use a Tobit regression framework of household portfolio weights on firm sports sponsorship, geographical proximity, stock characteristics, household and city demographics. This empirical setup, which is very similar to ones in Branikas, Hong, and Xu (2017a) and Branikas, Hong, and Xu (2017b), is suitable for capturing the sports

sponsorship effect on both the intensive and extensive margin of household portfolios.[8]

I propose an instrument for the investor exposure to sports sponsorship that is based on the interaction of sports team presence in a city with a firm's propensity to advertise. The identification concept is analogous to a difference-in-difference setup (e.g., Duflo (2001), Nunn and Qian (2014)) in the firm-city cross-section. To limit the impact of city unobservables, I only focus on households living in 71 Metropolitan Statistical Areas (MSAs) which were in the *market for a sports team*, i.e., in MSAs in which professional sports teams were located or were considering relocating. To measure a firm's advertising propensity, I use the product of its size with the total advertising expenditure in its industry. As a result, the treatment refers to the sports sponsorships in cities with sports teams, made by large firms in industries with high advertising expenses.

In the presence of an extensive list of controls (which includes, among others, the Fama and French (2015) factors, geographical and professional industrial proximity as well as the individual terms of sports team presence and firm advertising propensity), it is unlikely that household investments will depend on the treatment effect for any other reason than the actual sports sponsorship. Perhaps, one story could have been that households in cities with sports teams might better assess firms with certain features (e.g., high advertising propensity). But such a scenario seems improbable, since the demographics in the selected 71 MSAs are comparable.[9]

I follow a control function approach (e.g., Petrin and Train (2010), Wooldridge (2014)) to predict the probabilities with which the firms in the investment universe would sponsor sports teams in the selected cities (based on the city sports team presence - firm advertising propensity interaction). Once I estimate these probabilities, I incorporate them as additional controls in the censored portfolio weights regression, in order to correct, in the style of

[8] Branikas, Hong, and Xu (2017a) show that households' local bias can be explained by latent factors that drive their location choice. Branikas, Hong, and Xu (2017b) estimate the value of sell-side research for buy side portfolios, by modeling the impact of analyst coverage of stocks on mutual fund managerial holdings.

[9] Grinblatt and Keloharju (2001) find language effects on the portfolio choice in Finland. Yet, in the US, such effects seem impossible.

Heckman (1978), for the observed firm sports sponsorship in a given city.

I find that sports sponsorship increases a household's portfolio weight on a stock by about 50% relative to the average (i.e., about 4 bps when the average portfolio weight on a Russell 1000 stock - including the many zero positions - is 8 bps). Additionally, in terms of trading, sports sponsorship also increases a household's monthly stock buys by 36% relative to the average. However, there is no statistically significant decrease in the household's monthly stock sells. This suggests that product advertising is more relevant for the purchase decisions of retail investors. Notably, the positive effect on the household portfolio choice holds for stocks whose name can be directly recognized from the name of the product that is advertised.

In principle, the over-investment in stocks that advertise, can be explained by the same classes of models which interpret local bias. The local bias theories revolve around the causal role of geographical proximity. In rational models, investors know or can acquire more information from firms based close to them.[10] This implies that local stock-holdings are expected to yield higher returns than distant ones. In contrast, in behavioral models, proximity draws investors' limited attention and breeds a familiarity bias which is independent of portfolio returns.[11] Seasholes and Zhu (2010), however, show that the local bias portfolio under-diversification leads to underperformance. In line with this finding, I document an underperformance for the portfolio under-diversification that sports sponsorship causes. Moreover, given the advertising effect on stock choice that I identify, geographically distant firms can attract more retail investment by sponsoring a city's sports team. The interpretations of attention or salience seem thus to be more consistent with the data.[12]

I further analyze how local bias and product advertising interact with each other in the household portfolio demand and the consequent portfolio under-diversification. As in Table

[10] See, e.g., Merton (1987), Wang (1993), Coval and Moskowitz (2001), Van Nieuwerburgh and Veldkamp (2009).

[11] See, e.g., Sims (2003), Peng and Xiong (2006), Agarwal, Driscoll, Gabaix, and Laibson (2009), Gennaioli and Shleifer (2010).

[12] Along similar lines, Fang, Peress, and Zheng (2014) show an attention effect on the portfolio choice of mutual fund managers from the coverage of stocks in the media.

1, I classify stocks into four classes, based on whether they are local or distant (given their headquarters' proximity from a household's residence) and whether they sponsor a team in a household's city or not. I find that households have the strongest portfolio preferences for stocks that are local *and* sponsors of their local teams. By sports sponsoring their headquarters' city, local firms can increase their share in the household portfolio by about 20 bps (i.e., 250% relative to the average). Therefore, product advertising largely magnifies the local bias.

Importantly, investors living in a city where local teams are sponsored by a given non-local firm are far more likely to purchase stocks in that firm than in other distant firms which do not sports sponsor their city. The expected increase in the portfolio share amounts approximately to 40% relative to the average. In fact, the portfolio effects that the sports sponsorships of distant firms generate in a city can outweigh the local bias for stocks which do *not* sponsor a local team. Whether this happens or not depends on how far away the firms' headquarters are located. In particular, if locality is defined based on a 250-mile headquarters' distance from a household's residence, the sports sponsorship effect of distant stocks is found to be stronger than the investment bias for local firms that do not sports sponsor. As a result, the investment channel of product market advertising is found to matter more than the local bias.

The organization of the paper is as follows: In Section 2, I describe the data on the publicly traded primary sports sponsors and the retail investors' stockholdings. In Section 3, I discuss the empirical model and the identification strategy. In Section 4, I present the main empirical findings for the sports advertising effect on the household portfolio choice. In Section 5, I assess the over-investment in sports sponsorship, by estimating its impact on the household portfolio trades and returns as well as the relevancy of the direct recognizability of a stock from the names of its products. In Section 6, I study how the familiarity from sports sponsorship interacts with local bias. In Section 7, I conclude.

# 2. Data

## 2.1. Sports Sponsors

Data on the sports advertising of publicly listed firms are extracted from the 1993, 1994, 1995 and 1996 issues of Team Marketing Report's Sports Sponsor FactBook. Every issue refers to the contemporary sports season and contains a detailed description of the sports marketing activities of all sports sponsors at the brand level.[13] I only focus on the firms that Team Marketing Report characterized as *Primary Sports Sponsors* (i.e., "the most significant and active sports sponsors"). I use the CRSP US Stock Database to identify which of these firms were publicly traded at that time and find their historic PERMNO and CUSIP codes.

I restrict my attention to marketing activities in Major League Baseball (MLB), the National Basketball Association (NBA), the National Football League (NFL) and the National Hockey League (NHL). I record all the sports teams that the firms sponsored in the four professional leagues. I use the websites of Wikipedia and Sports Reference to find the stadiums in which the teams played their home games in each season.[14] The FactBook uses three main labels to describe the advertising of firms, namely (i) Sponsorship, (ii) Advertising and (iii) In-Stadium Signage. For a given sports sponsorship, these labels are not mutually exclusive. Although I have recorded these details, in the empirical analysis that follows, I am only interested in whether a publicly traded firm was marketed in a given Metropolitan Statistical Area (MSA) during a given sports season. To this end, I simply employ a firm-city-specific dummy variable, namely $SportsAd$, which equals to 1 if a firm sponsored a sports team in a given city.

In the FactBook, the sports marketing activities of firms are described at the brand level. Thus, in the process of the above aggregation, I am able to see how much overlap there is between the name of an advertised product and the name of its producer. In cases in which

[13] For example, the 1994 Sports FactBook was published on October 15th 1993 and referred to the 1993-1994 sports season.

[14] I account for the fact that, in some seasons, a few teams (e.g., Boston Celtics) used more than one stadium (e.g., the TD Garden and the Hartford Civic Center).

the name of a brand is very different, I use the websites of Youtube and Adland to see if the company name or logo was displayed on the TV commercials that were aired in the 90's. With this criterion in mind, when I construct the dummy variable *SportsAd*, I assign the value 1 only if the company could be directly recognized from the sponsorship. I use the same filter also for public holding companies which were parents of primary sponsors.[15]

Table 2 describes the distribution of the directly-recognizable publicly traded primary sports sponsors over time.[16] Their average number in a sports season is 170. About 70% of these firms belong, on average, in the Russell 1000 Index (which includes the largest 1000 stocks based on market capitalization). From the remaining 30%, 10% corresponds to foreign firms (with US headquarters) traded via an American depository receipt (ADR).

When assigning the publicly listed sponsors in one of the 17 Fama-French industry portfolios, most of them (i.e., 17% on average) belong to the portfolio of retail stores (Rtail). 14% are in the financial portfolio (Finan), while another 14% are in the "other or services" portfolio (OthSvc). Similarly, about 10% are in the portfolio of food (Food), while another 10% are in the portfolio of transportation (Trans). About 9% are in the portfolio oil and petroleum products (Oil).

Furthermore, during a given sports season, a publicly traded sports sponsor advertises on average in 4 Metropolitan Statistical Areas (MSAs), with the median number being equal to 2 or 3. Therefore, it is not the case that sports sponsors advertise only in the cities where they are headquartered.

## 2.2. Household Stock Holdings and Demographics

Data on household stock holdings are drawn from the database of a large national discount broker. See Barber and Odean (2000) for a detailed description. The dataset is an unbalanced

[15]For example, drug commercials (e.g., Advil) typically did not display the name of their manufacturer (e.g., American Home Products). Therefore, in most cases, pharmaceutical stocks were not directly recognizable from their sponsorship. Similarly, it was difficult for someone to think of Philip Morris while watching a product commercial of General Foods USA, which was one of the company's subsidiaries at that time.

[16]The distribution of the non-directly-recognizable publicly traded primary sports sponsors is given in Table 10.

panel for the period 1991-1996 and contains month-end account statements of 78,000 retail investors at the stock level (CUSIP code). As Ivković and Weisbenner (2005) report, the majority of accounts is non-retirement (e.g., cash or investment) and the few retirement accounts do not refer to 401(k) plans. Therefore, mechanical effects on the stock choice from the shares of an employer are limited.[17]

Not all investors have complete demographic information. In my analysis, I only keep households which have a non-missing address ZIP code and non-missing income, family size, age and gender of their head. Unfortunately, the data do not contain any information about the education, race and industrial sector of the household's head. To correct for that, I follow Korniotis and Kumar (2011) and extract from Census 1990 the education status (i.e., the probability of holding a B.A. or higher degree) and the racial profile (i.e., the probability of being White, Black, Hispanic, Asian or other) at the household's ZIP Code. Moreover, I use the distribution of the employed persons into industries at the ZIP Code level to measure the household's (expected) professional industrial proximity to a stock, in the style of Massa and Simonov (2006).[18]

From the address ZIP codes and the geographic relationship files of the US Census Bureau, I identify the Metropolitan Statistical Areas (MSAs) in which households reside. To construct my identification design, I only focus on 71 MSAs which were in the "market for a sports team". On average, every year, that set includes about 38 MSAs in which professional sports teams were present and 33 MSAs which did not have any professional sports team, but whose local governments were trying to persuade franchise owners to move in. The latter subset of MSAs is based on the lists of cities provided by Euchner (1993) and Danielson (1997).

For the selected 71 MSAs, I collect annual demographic series from a variety of sources. From the Bureau of Economic Analysis (BEA), I draw the total income, while, from Bureau

[17]Employee stock ownership plans were not popular in the early 90's.

[18]For example, New Yorkers living in Upper East Side are expected to be familiar with stocks in the financial sector, since many investment bankers reside there.

of Labor Statistics (BLS), I extract the population and unemployment rate. Additionally, following Bishop (2007), I construct a measure of median home values (for every MSA in every year of the sample) based on the time series of the house price index (HPI) of the Federal Housing Finance Agency (FHFA) and the median home values in Census 2000.[19]

The universe of stocks that I examine is the union of the publicly traded sports sponsors (described in the previous subsection) and the set of stocks that were ever members of Russell 1000 during the sample. Since 70% of the firms with sports marketing activities belong to Russell 1000, the remaining stocks in the index comprise an appropriate comparison group for the study of the advertising effect on portfolio choice (see Panel G of Table 3). The ever-membership requirement protects the identification from mechanical effects on the stock choice caused by the Russell's 1000 reconstitution. I also require stocks to have observable financial characteristics at a monthly frequency (described below). Retail investors who do not hold any stocks in the universe are omitted from the analysis.[20]

In every month, the portfolio weights of a household are constructed by dividing the dollar value on a stock with the total dollar value of the household's holdings in the universe. Most households in the data have multiple accounts. When I derive the dollar value of an investor's position, I take into account all his accounts. Households whose portfolio value is less than 1,000 dollars are dropped from the analysis.

To study the impact of the sports sponsorships, I focus only on the monthly statements in the sports seasons for which I have advertisement data from the FactBook. Specifically, I start my sample period in September 1992 and end it in August 1996. All the monthly statements from the September of year $t$ until the August of year $t+1$ are assigned to the sports season that ends in year $t+1$.

Applying these filters leads us to a sample of 18,421 different households and 1,407 different stocks for the whole period.[21] On average, in every month, there are 9,462 households

[19] Relying solely on the HPI would have limited the house price variation across MSAs, since the HPI of all MSAs has as base year the year 1995. I thank Selale Tuzel for this comment.

[20] Given the definition of the stock choice set, all other stocks can be viewed as outside assets.

[21] Although the beginning and end of the households' time series is different, there is a decreasing trend

choosing from 1,256 stocks with a complete list of financial characteristics. The geographical distribution of the households, along with the headquarters of the stocks and sports teams is depicted in Figure 1, on a map of latitude and longitude coordinates. Overall, the sample is dispersed enough to be representative of the US population. Moreover, in terms of the potential local bias, households are always located near the headquarters of some firms. MSAs without sports teams are also not that far away from MSAs with sports teams.

To assess the trading activity of the selected households, I calculate their sales and purchase turnover as Barber and Odean (2000). On average, the monthly sales turnover is 3.20%, while the monthly purchase turnover is 4.05%. In other words, the retail investors in the sample are not passive, since they buy 48.6% and sell 38.4% of their portfolio every year.[22]

The summary statistics of the household stock holdings are presented in Panel A of Table 3. The average portfolio value of a household is 38.44 thousand dollars, while the median is 13.30 thousand dollars. The standard deviation of the portfolio value is 143.36 thousand dollars. In line with the observed portfolio sparsity, the median portfolio weight is zero. On average, a household holds 2.73 stocks in a given a month. The median number of stocks that are held is 1.92, while the standard deviation is 2.78. The average portfolio weight of a household on a stock in the universe is 7.97 basis points (bps), while the standard deviation is 234.58 bps.[23]

Panel B depicts the summary statistics for the stock geographical proximity and sports advertisement in the investment universe. The average distance between the address ZIP code of a household and the address ZIP code of a stock's headquarters is 920.54 statute miles. The standard deviation is 604.01. On average 84% (93%) of the investment universe is at least 250 miles (100 miles) away from the household residence. Moreover, on average,

in their number (from 14,280 households in September 1992 to 6,290 in August 1996).

[22]For all households and all stocks in the database, Barber and Odean (2000) document an average annual portfolio turnover of 75%.

[23]Conditioning on the household's stockholdings (i.e. looking only at the intensive margin of the household portfolio), the average portfolio weight on a stock 0.37, with the median being 0.23.

2% of stocks in the investment universe sponsor a sports team in the city where a household lives (taking into account also households in cities without sports teams).

Panel C of Table 3 presents the summary statistics of the household's demographics. The average income is 93.43 thousand dollars, while the median is 87.50 thousand dollars. Households are on average 54.04 years old, with the median age being equal to 50. Moreover, 89% of the retail investors are on average men. The average family size of a household is 2.47, while the median is 2.

Panel D of Table 3 describes the summary statistics of the MSAs in which the households live. On average 53% of the MSAs have a professional sports team. The population is on average 2.07 million, with a median equal to 2.66 million. The average income per capita in a MSA is 23.80 thousand dollars, with a standard deviation of 3.02. The median home value is on average 97.25 thousand dollars and has a standard deviation of 30.36. The unemployment rate is on average 5.17% and has a standard deviation of 1.43.

## 2.3. Stock Characteristics

Monthly data on stock prices and returns are drawn from CRSP, while firm accounting variables are collected from Compustat at a quarterly frequency. Stocks with missing observations are dropped from the sample. The list of financial variables that I use consists of the price, the market capitalization (Size), the book-to-market ratio (Book/Market), the turnover ratio (i.e., Turnover, defined as volume over number of shares outstanding), the momentum (i.e., Momentum, defined as the past annual return), the volatility (i.e., Volatility, defined as the standard deviation of monthly returns in the past year), profitability (i.e., Profitability, defined, as in Novy-Marx (2013), as the ratio of past annual gross profits to assets), the investment (i.e., Investment, defined as the past annual growth rate of assets) and the past annual sales (Sales). All these variables are constructed at a monthly frequency. I assume that a household's investment decision in month $t$ is based on the stocks' price in

that month and the above risk factors in month $t-1$.[24]

From Compustat, I also extract data on the firms' advertising expenses. To fill in some missing observations, I merge the Compustat data with the contemporary annual reports on the 200 Leading National Advertisers, provided by the Advertising Factbook of the Advertising Age magazine.[25] The industry advertising expenditure, in each of the 17 Fama-French industry portfolios, is calculated by summing up the advertising expenses of all industry participants in the Compustat universe (and not just the investment universe).

Since Compustat contains only the most recent headquarters' addresses of the stocks, a variety of sources is utilized to ensure that the headquarter information in the sample period is accurate.[26] In particular, the addresses of all sports sponsors are obtained from the Sports Sponsor FactBook of Team Marketing Report. For the other firms, I use the SEC's EDGAR, Comphist and a digitized sample from the Who Owns Whom Database.[27]

Panel E of Table 3, depicts the time-series average of the total advertisement expenditure in an industry. As expected, in terms of ranking, the industries of services (OthSvc), food (Food), consumption (Cnsum) and retail stores (Rtail) are first. The advertising expenditure of every firm in the investment universe is summarized in Panel F. In particular, the overall average is 219.27 million dollars, with the median being equal to 59.36 million dollars. The publicly traded primary sports sponsors are heavy spenders of advertising. Their average expenses on ads is 374.77 million dollars and their median equals 158.98 million dollars. The other firms in Russell 1000 spend, on average, about 60% less (i.e., 149.75 million dollars). Their median is about 1/5 of the sports sponsors' median (i.e., 35 million dollars).

The summary statistics of the financial characteristics of a stock in the universe, during

[24] As in Fama and French (1992), to make sure that firms' balance sheet information is known to investors, I match the accounting variables from the fiscal year $t-1$ with the stock prices from the July of year $t$ until the June of year $t+1$.

[25] Historical copies were obtained and digitized from the LexisNexis Database.

[26] For example, Boeing Co. is nowadays headquartered in Chicago, but, during the 90's, it was based in Seattle. Pirinsky and Wang (2006) identify 118 firm relocations from 1992 to 1997 and Tuzel and Zhang (2017) about 300 from 1990 to 2005. Usually, firms that move are small and not members of Russell 1000.

[27] The SEC's EDGAR data are obtained from Bill McDonald's website at https://www3.nd.edu/~mcdonald/10-K_Headers/10-K_Headers.html. I thank Christo Pirinsky for letting me know about this source.

the sample period, are depicted in Panel G of Table 3. The average price is 34.79 dollars, with a standard deviation of 24.37. The average size is about 3.5 billion dollars, while the median size is 1.3 billion dollars. Book-to-market is on average 6.07, with a standard deviation of 113.41. The average monthly turnover ratio is 10%, with a corresponding standard deviation of 0.13. Momentum is on average 10%, with a standard deviation of 0.60. Volatility is on average 8% and has a standard deviation of 0.05. Profitability is on average 0.33 and Investment 0.19. The average sales of a firm equal roughly 4 billion dollars, while the median 1.2 billion dollars.

The panel also indicates the summary statistics of the financial characteristics of the publicly traded primary sports sponsors and the other firms in Russell 1000 separately. In terms of turnover, momentum, volatility, profitability and investment, the two groups of stocks are similar. In terms of market capitalization, firms which advertise are bigger. The average size of a publicly listed sports sponsor is about 10 billion dollars, with the median being equal to 3.6 billion dollars. On the other hand, the average size of the other firms in Russell 1000 is 2.5 billion, with the median being equal to 1.2 billion dollars. Although the mean and standard deviation of book-to-market differs between the groups, their median is similar.[28] Besides size, sports sponsors have also larger (past) sales. Their average and median equal 13.7 and 6.5 billion dollars respectively, while other stocks have a mean of 2.4 and a median of 1.1 billion dollars.

[28]The first and third quartile is also similar, (i.e. for the sports sponsors it is Q1=0.30 and Q3=1, while for the other firms in Russell 1000 it is Q1=0.24 and Q3=0.6.)

# 3. Empirical Approach

## 3.1. Portfolio Choice

To identify the impact of product market advertising on household portfolio choice, I setup a simple static empirical specification in the cross-section of households, cities and stocks. When I estimate the model, I run this specification for every month in the sample separately. I then focus on the interpretation of the average values of the estimated parameters. Therefore, there is no period subscript $t$ in the discussion that follows.

In the retail investment data, there is a high degree of portfolio sparsity, in the sense that a household owns on average 2 to 3 different stocks. To capture that sparsity as well as the fact that households do not short, I assume that household $i$, residing in city $c$, decides how much to invest in stock $j$ according to a linear factor rule censored at zero, i.e.:[29]

$$w_{i,c,j} = (\alpha + \beta SportsAd_{c,j} + \boldsymbol{\gamma}\boldsymbol{X}_{i,c,j} + \epsilon_{i,c,j})^{+} \tag{1}$$

where $(\cdot)^{+} \equiv \max\{\cdot, 0\}$ captures household $i$'s extensive and intensive margin. $SportsAd_{c,j}$ is a dummy variable that equals 1 if stock $j$ sponsors a sports team in city $c$ (where household $i$ resides) and 0 otherwise. Its coefficient ($\beta$) and marginal effect are the main objects of interest from the identification.

$\boldsymbol{X}_{i,c,j}$ is a vector of observable fundamentals that are introduced as controls. A key element is the (log) distance between household $i$'s residence and stock $j$'s headquarters at the ZIP Code level, which captures the well-established phenomenon of local bias. Other observable fundamentals refer to stock $j$'s financial characteristics, such as the Fama and French (2015) factors (i.e., size, book-to-market ratio, profitability, investment) as well as extra factors (i.e., turnover, momentum, volatility, industry fixed effects) from the stock demand literature (e.g., Gompers and Metrick (2001), Goetzmann and Kumar (2008)).

[29] There is a number of ways to microfound this censored regression (e.g., Brandt, Santa-Clara, and Valkanov (2009), Hjalmarsson and Manchev (2012), Gârleanu and Pedersen (2013), Hortaçsu and Kastl (2015)), Hong and Xu (2015), Koijen and Yogo (2016), Branikas, Hong, and Xu (2017b).

Following the Finance literature on advertising (e.g. Grullon, Kanatas, and Weston (2004), Lou (2014)), I also include as a factor the firm's past annual sales. Moreover, to account for the heterogeneity of preferences or beliefs across investors, I control for household $i$'s demographics (e.g., income, the head's age and gender, family size, education, race, professional industrial proximity to a stock) and city $c$'s demographics (e.g., population, income per capita, the median home value, unemployment rate).

The error term, $\epsilon_{i,c,j}$, can be interpreted as household $i$'s latent demand for stock $j$. It encompasses household $i$'s optimism or pessimism about stock $j$'s prospects as well as private information. In line with a Tobit model, I assume that, conditional on all observables, these idiosyncratic demand shocks are distributed according to the normal distribution.

In the spirit of Petersen (2009), in the estimation of the model, I use two-way clustered standard errors at the household and city level. On the one hand, the clustering at the household level accounts for the joint decision of an investor's portfolio shares across stocks. On the other hand, the city-clustering is consistent with the fact that investors in the same city choose from the same local stocks and face the same local news and economic conditions.

## 3.2. Instrument of Sports Sponsorship

The extensive list of controls in Equation (1) does not eliminate the possible presence of unobserved firm-city fundamentals that could be related to the observed sports sponsorship. Local firm reputation or tastes, in particular, might be correlated with where a firm offers a sports sponsorship. In that case, a part of the estimated advertising effect might be due to some unobserved catering of existing tastes in the area.

For example, in 1993, Allied Signal Inc. (of Morristown, N.J.) sponsored the Pittsburgh Penguins instead of the New York Islanders. One year ago (i.e., in 1992) it had relocated its research engineering department from New York City to Detroit, firing a few hundred New Yorkers. It is thus likely that, at that time, Pittsburghers liked the firm more than New Yorkers in the first place, independently of any product advertising. But if it were so, then

that could have been why Allied Signal offered a sports sponsorship in the City of Bridges and not in the Big Apple.

To address the endogeneity problem, I construct a sports sponsorship instrument based on two sources of exogenous variation. The first source of variation is in the cross-section of cities and refers to (major league) *sports team presence*. The second source of variation is in the cross-section of firms and refers to *advertising propensity*. The intuition for the use of these two variables is explained below.

The presence of sports teams in a city is a necessary condition for sports sponsorship. In the US, on average, only about 38 cities have a team in the four major sports leagues every year.[30] At the same time, there are about 33 cities which do not have a professional sports team, but are trying to get one.[31] In terms of demographics, the former cities are not that different from the latter cities. In fact, they can be matched with them. In a given matched pair of cities (e.g., Salt Lake City vs. Albuquerque), sports team's presence, and thus sponsorship exposure, is determined by random factors, such as more favorable stadium deals, availability of better facilities and personal preferences of franchise owners.[32] Importantly, sports sponsorship is only a small fraction of a team's annual revenue (i.e. about 8% on average), which franchises can get in any of these cities.[33]

My proxy for the advertising propensity of a firm is given by the product of the firm's size (e.g., market capitalization) and the total advertising expenditure in the industry of the firm. Both a firm's size and industry are natural predictors of a firm's advertising expenses. Larger firms have the resources to spend more on advertising. And firms that are in industries with high advertising expenses (e.g., retail stores or food sector) need to advertise more to be

[30] At least one professional sports team, to be exact. My analysis is not sports-specific and looks at the extensive margin of firm advertising in a city (captured by my firm-city-specific indicator variable).

[31] In the US, the professional sports teams are in limited supply. The leagues refuse to add more teams, so that teams can extract benefits from local governments. Given the opportunity and based on their demographics, the selected cities with no sports team (which are obtained from sports economics sources) were in position to address the requests of franchise owners.

[32] The Rams recently relocated from St. Louis to Los Angeles, in order to play in the Inglewood Stadium. The Rams had been playing in St. Louis since 1995, when Georgia Frontiere, the team's owner back then, brought them from Los Angeles to her home town.

[33] For their revenues, sports franchises rely mostly on TV rights and gate receipts.

competitive. Firm size times industry advertising expenses thus captures the tendency of big firms in industries with big advertising expenses (e.g., Pepsico Inc.) to advertise more and thus be affected more by the presence of a sports team in a city.

To instrument the observed sports sponsorship of a firm in a city based on the two above sources of variation, I use the *interaction* of the city's sports team presence and the firm's advertising propensity. Importantly, I also include both these two individual terms as additional controls in the vector $\boldsymbol{X}_{i,c,j}$ of Equation (1). That is, the presence of sports teams in a city is perceived to be another city demographic variable, while a firm's advertising propensity is perceived to be another stock financial factor. In that way, the identification relies only on the interaction term being *excluded* from the portfolio equations and operating only through the observed sports sponsorship (conditional on the controls).

The pursued identification strategy is very similar to a difference-in-differences estimation (e.g., Duflo (2001), Nunn and Qian (2014)). In a "diff-in-diff" setup, the reduced-form estimation would have simply compared the difference in the investments of households in cities with sports teams relative to the investments of households in cities without sports teams, in stocks with high advertising propensity relative to stocks with low advertising propensity. Yet, here, the focus is on the effect of the actual sports sponsorship of a firm in a given city. The instrument switches that effect on, since a big firm in an industry with big advertising expenses is more likely to sports sponsor a city with a team.

A priori, there seems to be no obvious reason for which the proposed instrument might be affecting household stock investment through a channel different than sports sponsorship. A potential story according to which the households in the cities with sports teams can better assess firms with certain features (e.g., high advertising propensity) is unlikely to be true, since the demographics of the cities which are selected as well as the retail investors in the database who live there are comparable. Moreover, besides the Fama and French (2015) factors, the observable fundamentals for which I control in Equation (1) contain the household-stock geographical and professional industrial proximity, i.e., the household-stock-

specific variables that matter most.

### 3.3. Control Function Approach

Based on the previous discussion, I setup a first-stage equation that predicts firm $j$'s sports sponsorship in city $c$ based on the proposed instrument. The sports sponsorship specification that I use is static and refers only to the cross-section of firms and cities. For every sports season, I estimate the model separately and compute average annual coefficients and economic effects. In particular, the first-stage equation is as follows:

$$SportsAd_{c,j} = \mathbf{1}\left[\kappa + \lambda ZAd_{c,j} + Controls_{c,j} + \omega_{c,j} \geq 0\right] \tag{2}$$

where $ZAd_{c,j} \equiv Sportsteam_c \times (LogSize_j \times LogInduAD_j)$ is the instrument of firm $j$'s advertising exposure in city $c$. In more detail, $Sportsteam_c$ is a dummy variable equal to 1 if city $c$ has a sports team, $LogSize_j$ is the market capitalization of firm $j$ (in logs), while $LogInduAD_j$ denotes the total advertising expenditure in firm $j$'s industry (also in logs). $LogSize_j \times LogInduAD_j$ is the measure of firm $j$'s advertising propensity.

The controls in Equation (2) reflect more aspects of firm $j$'s advertising choice in a given city. They include firm $j$'s distance from city $c$, firm $j$'s size, the total advertising expenditure in firm $j$'s industry and city $c$'s demographics (i.e. population, income per capita, median home values, unemployment rate). As for the error term $\omega_{c,j}$, it captures unobservable factors that influence firm $j$'s sports advertising in city $c$. Conditional on all observables, these firm-city idiosyncratic shocks are assumed to be independently and identically distributed according to the standard normal distribution. To also account for some additional firm and city unobserved heterogeneity, in the estimation of Equation (2), standard errors are clustered at the firm and city level.‘

With Equation (2) in hand, any potential correlation between the household latent demand for a stock ($\epsilon_{i,c,j}$) and the stock's sports sponsorship in the household's residence city

($SportsAd_{c,j}$) is attributed to the correlation between the former and the unobservable advertising factors that the stock faces in the city ($\omega_{c,j}$). Using a control function approach (e.g., Petrin and Train (2010), Wooldridge (2014)), it is possible to account for the correlation of the two errors by adding functions of the probability with which the firm is predicted to sports sponsor the household's city as additional explanatory variables in Equation (1). These probabilities are predicted following the first-stage estimation of Equation (2).

More clearly, letting $V_{c,j} \equiv \kappa + \lambda ZAd_{c,j} + Controls_{c,j}$ be the observable criterion with which firm $j$ sports sponsors city $c$, the latent demand of household $i$, in city $c$, for stock $j$ can be decomposed as follows:

$$\epsilon_{i,c,j} = \mathbb{E}\left(\epsilon_{i,c,j} \left| \omega_{c,j}, V_{c,j} \right.\right) + \tilde{\epsilon}_{i,c,j} \tag{3}$$

where $\tilde{\epsilon}_{i,c,j}$ is an idiosyncratic household-city-stock specific investment error, which is, by construction, independent of firm $j$'s sports sponsorship in city $c$. That is, $\tilde{\epsilon}_{i,c,j}$ is mean independent of all observables (and assumed to be i.i.d according to the standard normal distribution). As for the conditional expectation of the original latent demand, it can be written, in the spirit of Heckman (1978), as follows:[34]

$$\mathbb{E}\left(\epsilon_{i,c,j} \left| V_{c,j}, \omega_{c,j} \right.\right) = \underbrace{SportsAd_{c,j} \cdot \Psi_1\left(p_{c,j}\right) + \left(1 - SportsAd_{c,j}\right) \cdot \Psi_0\left(p_{c,j}\right)}_{\Psi(SportsAd_{c,j}, p_{c,j})} \tag{4}$$

[34] In a nutshell, the instrumentation of $SportsAd_{c,j}$ can be viewed as a generalized selection correction. For instance, if $SportsAd_{c,j} = 1$, then it is expected that the unobservable firm-city advertising factors are high enough for firm $j$ to sports sponsor city $c$. How much these "favorable" unobservable advertising factors correlate with the household's portfolio latent demand depends on their joint distribution. In any case, the correlation will be a function of the observable advertising criterion of firm $j$ for city $c$, which is estimated following the first-stage. Equivalently, by monotonicity, the conditional expectation of the household latent demand is a function of the respective (predicted) sports sponsorship probability, i.e.:

$$\begin{aligned} \mathbb{E}\left(\epsilon_{i,c,j} \left| \omega_{c,j} \geq -V_{c,j}, V_{c,j} \right.\right) &= \int_{-\infty}^{+\infty} \int_{-V_{c,j}}^{+\infty} \frac{\epsilon_{i,c,j} dF\left(\epsilon_{i,c,j}, \omega_{c,j} \left| V_{c,j} \right.\right)}{\mathbb{P}\left(\omega_{c,j} \geq -V_{c,j} \left| V_{c,j} \right.\right)} \\ &\equiv \psi_1\left(V_{c,j}\right) = \Psi_1\left(p_{c,j}\right) \end{aligned}$$

Analogously, if $SportsAd_{c,j} = 0$, then $E(\epsilon_{i,c,j} | \omega_{c,j} < -V_{c,j}, V_{c,j}) = \Psi_0(p_{c,j})$, where $\Psi_0(\cdot)$ is another correction function (different than $\Psi_1(\cdot)$ ).

where $p_{c,j}$ is the probability that firm $j$ sponsors a sports team in city $c$ and $\Psi_0(\cdot)$, $\Psi_1(\cdot)$ are unknown correction functions.[35] Combining Equations (1), (3) and (4) yields that the equation to be taken to the data is:

$$w_{i,c,j} = (\alpha + \beta SportsAd_{c,j} + \boldsymbol{\gamma} \boldsymbol{X}_{i,c,j} + \Psi\left(SportsAd_{c,j}, p_{c,j}\right) + \tilde{\epsilon}_{i,c,j})^{+} \tag{5}$$

In the estimation of Equation (6), I approximate the correction functions, $\Psi_0(\cdot)$, $\Psi_1(\cdot)$, with polynomials of second or third order.

# 4. Estimation

## 4.1. Controlling for Observable Fundamentals

First, I discuss the estimation results from Tobit portfolio weight regressions which control for observable fundamentals, but do not correct for the endogeneity of *SportsAd*. The results are presented in Table 4. They refer to the average monthly coefficient estimates of Equation (1) and the respective average $t$-statistics based on clustering standard errors at the household and city level.

As reported in Column 1 of Panel A, in the absence of household demographics, stock characteristics and city demographics, but with the inclusion of the household-stock distance at the ZIP Code level in logs, the coefficient of *SportsAd* is 0.682 and has a $t$-statistic of 14.81. In Column 2, which incorporates household demographics (i.e., *LogIncome*, *LogAge*, *LogFamSize*, etc.), the coefficient of sports sponsorship remains virtually unchanged, being equal to 0.680, with a $t$-statistic of 15.02. In Column 3, in which stock financial characteristics (i.e., *LogSize*, *Book/Market*, etc.) are also introduced, the coefficient of sports advertising drops approximately by 57%, becoming equal to 0.294, with a $t$-statistic of 7.06. Further adding city demographics (i.e., *LogPop*, *LogIncPerCap*, etc.) in Column 4 results in almost

[35] The correction functions are zero only if $\epsilon_{i,c,j}$ and $\omega_{c,j}$ are independent.

the same coefficient estimate as before (i.e., 0.300) and a $t$-statistic of 7.69.

The economic effect of sports sponsorship on the portfolio weight is defined as the marginal effect of a discrete change in $SportsAd$ from 0 to 1 and is calculated at the mean values of the controls. It is also estimated for every month separately. Its average monthly value is presented in Panel B of Table 4. Column 1 shows that, with only distance as a control, sports advertising impacts the portfolio weight by 32.46 bps. This figure corresponds to 407.3% of the average portfolio weight on a stock in the investment universe, when taking into account the extensive margin. With household demographics, in Column 2, the economic effect is very slightly decreased (as is the coefficient) to 32 bps or 401.5% of the mean portfolio weight. In Column 3, which also accounts for stock financial characteristics, the economic effect is decreased by approximately 85%. Specifically, it equals 4.79 bps or 60.1% of the mean portfolio weight. Introducing city demographics in Column 4, slightly raises the sports advertising impact to 4.92 bps or 61.7% of the mean.

As for the estimated coefficients of the controls, $LogDist$ always enters negatively and with a strongly statistically significant coefficient, which is in line with the households' local bias. The average value of its coefficient estimate does not change much across the four columns. However, depending on controls, the implied economic effect of distance ranges from 2.31 bps to 1.33 bps (or equivalently from $-29\%$ to $-16.7\%$ of the mean).

Turning to the household demographics, $LogIncome$, $LogAge$ and $Male$ have positive and statistically significant coefficients. On the other hand, the coefficient of $LogFamSize$ is negative and statistically insignificant. The coefficients of the racial profile variables (i.e., $Black$, $Hispanic$, $AsianOther$) are also not statistically significant. Moreover, a household's expected education and professional industrial proximity, i.e. $Educ$ and $ProfProxim$, enter its investment equation with positive and statistically significant coefficients.

Among the estimated coefficients of the stock financial characteristics, the ones of $LogSize$, $Turnover$, $Volatility$, $LogSales$ and $LogSize \times LogInduAD$ (which measures the firm's advertising propensity) are positive and statistically significant. $Momentum$ and $Investment$

enter the household investment equation with negative and statistically significant coefficients. The estimated coefficients of $Book/Market$ and $Profitability$ are close to zero and statistically insignificant.

The coefficients of the MSA demographics are presented in Column 4. $LogPop$, and $LogIncPerCap$, have coefficients which are negative and statistically significant. The coefficient of $LogMedHome$ is also a statistically significant, but positive. The coefficient of $UnempRate$ is very small and statistically insignificant. $Sportsteam$ has a positive and statistically significant coefficient.

Based on the estimates from these regressions, even in the presence of all the observable fundamentals, the sports marketing activities of a publicly traded firm in a city are associated with a strong positive effect on that city's household portfolios (equal to 61.7% of the average household portfolio weight on a stock). In fact, the magnitude of that effect is stronger than the one from a stock's geographical proximity (which is 16.7% of the mean).

## 4.2. Controlling for Unobservable Fundamentals

### 4.2.1. First Stage

The results from the Probit regressions of firm sports sponsorships in cities, which Equation (2) describes, are presented in Table 5. The table depicts the average coefficient estimates and the average $t$-statistics from separate year-by-year estimations.

As reported in Panel A, the coefficient of the instrument, $ZAd$, is positive and strongly statistically significant, regardless of the presence of controls. In particular, in Column 1, where there are no other explanatory variables, the coefficient of $ZAd$ is 0.022 with a $t$-statistic of 9.8. In Column 2, where distance, firm size and total advertisement expenses of the firm industry (i.e., $LogSize$ and $LogInduAD$) are added as controls, the coefficient of $ZAd$ becomes 0.035 with a $t$-statistic of 4.53. Column 3 augments the probit regression also with city demographics, such as population ($LogPop$), income per capita ($LogIncPerCap$), median home values ($LogMedHome$) and unemployment rate ($Unemp$). Consequently, the

coefficient slightly decreases to 0.031 with a $t$-statistic of 3.12.

The economic effect of the instrument on the probability with which a firm sports sponsors a city (defined as the marginal effect of $ZAd$ times a 1 standard deviation increase) is shown in Panel B of Table 5. As stated in Column 1, without any controls, the impact of $ZAd$ on the probability of sports advertising is 55.5 bps. Given that the average probability that a firm sports sponsors a given city is 107.8 bps, the effect corresponds to 51.6% of the mean. In Column 2, which controls for firm characteristics, the economic effect equals 35 bps or 32.5% of the mean. In Column 3, where city demographics are also added, the economic effect becomes equal to 21.5 bps or 20.0% of the mean. Therefore, the estimation results from the first-stage verify that conjecture that the instrument is a strong predictor of a firm's sports marketing activities in a city.

#### 4.2.2. Second Stage

Table 6 depicts the results from the Tobit regressions that correct for $SportAd$ endogeneity using the control function method. In the odd numbered columns (i.e. Columns 1, 3, 5 and 7), the approximation of the correction functions $\Psi_0$ and $\Psi_1$ is quadratic, while in the even numbered columns (i.e Columns 2, 4, 6 and 8) the approximation is cubic. For a given set of controls, both orders of polynomial approximation yield similar results. Panel B, as before, depicts the estimated economic effect of sports advertisement and local bias on the household portfolio choice.

In Columns 1 and 2 of Panel A, the portfolio weights regressions on sports sponsorship control only for the local bias and the sports sponsorship endogeneity. In comparison to Column 1 of Table 4 (which does not correct for the sports sponsorship endogeneity), the estimated coefficient of $SportsAd$ is dropped from 0.682 to 0.345 or 0.316, depending on the polynomial approximation order of the correction functions. The economic effect is substantially decreased from 32 bps to 9.35 bps or 6.48 bps. In Column 3 and 4, household demographics are added as controls. The coefficient of sports sponsorship again is decreased

from 0.680 (in the uncorrected case) to 0.346 or 0.317. The implied economic effect goes down as before, from 32 bps goes to 9.31 bps or 6.41 bps.

Columns 5 and 6, further add stock characteristics as regressors. The coefficient of *SportsAd* is now reduced to 0.249 or 0.238 from 0.294. This time, the decrease in the economic effect of sports sponsorship is more moderate, from 4.79 bps to 3.7 bps or 3.42 bps. Column 7 and 8 incorporate also city demographics in the household investment equation. The estimated coefficient of *SportsAd* then becomes 0.262 or 2.55, with a respective economic effect of 3.98 bps or 3.73 bps. Based on Column 4 of Table 4, without including correction functions, the coefficient of sports sponsorship is estimated to be higher (i.e., 0.300), as is the corresponding economic effect (i.e., 4.92 bps).

Based on the above results, the instrumentation of sports sponsorship reduces its impact on the portfolio, but not much. The fact that the new estimates of the *SportsAd* are smaller than before indicates indeed the possible presence of some firm catering to local tastes. However, in Column 7 and 8 of Table 6, where all observable fundamentals are included as controls in the portfolio weights regression, the reduction of the effect is not that sizable. In particular, the economic impact of sports sponsorship becomes equal to 49.9% to 46.8% of the average portfolio weight on a stock in the investment universe, from 61.7% in the uncorrected case.

Furthermore, in terms of the estimation of the coefficient of sports sponsorship, the instrumentation produces comparable results, even in the absence of some observable fundamentals as controls. That is, roughly, the estimates of *SportsAd* seem to be close with each other on average (across the first line in Panel A of Table 6). The coefficient of sports sponsorship also remains highly statistically significant. As for the coefficients of the controls, these are quite similar as before, with the local bias increasing very slightly.

# 5. Assessing the Advertising Over-Investment

## 5.1. Portfolio Trades

The censored regression framework for the household portfolio weights can also be used for the study of the sports sponsorship effect on the household trading activity. In the spirit of Barber and Odean (2000), I calculate the values of stock purchases and sales for every household in every month. I then scale the values of the households' monthly trades with their portfolio values in the respective month. In more detail, in a given month, household $i$'s value of buys of stock $j$ is given by the number of stock $j$'s shares that household $i$ purchases (during that month) times the end-month price of stock $j$, divided by the household $i$'s portfolio value at the end of the month, i.e.:

$$buy_{i,j,t} \equiv \frac{P_{j,t}\left(n_{i,j,t} - n_{i,j,t-1}\right)}{\sum\limits_{j \in \mathcal{J}} P_{j,t} n_{i,j,t}} \tag{6}$$

Analogously, in a given month, household $i$'s value of sells of stock $j$ is given by the number of stock $j$'s shares sold by household $i$ (during that month) times the price of the stock at the beginning of the month, over household $i$'s portfolio value at the month's start date, i.e.:

$$sell_{i,j,t} \equiv \frac{P_{j,t-1}\left(n_{i,j,t-1} - n_{i,j,t}\right)}{\sum\limits_{j \in \mathcal{J}} P_{j,t-1} n_{i,j,t-1}} \tag{7}$$

In addition, the first and last monthly observations of a household's time series are dropped in the calculations. As a result, the value of a household's trades (relative to the portfolio value) is always bounded by zero and one.

As in the Tobit portfolio weight regressions, I run a censored regression for household $i$'s buys and a censored regression for household $i$'s sells in every month separately. I then again compute the average coefficient estimates and $t$-statistics (based on standard errors clustered at the household and city level). In the Tobit model of the buys, I let household $i$ choose which (and how much) stock to purchase from all the available ones in the investment

universe. On the other hand, since households do not short, in the Tobit model of the sells, I let household $i$ choose which (and how much) stock to sell from the ones it holds at the end of the past month.

The estimation results from the household trading Tobit regressions are presented in Table 7. Columns 1 and 2 refer to household $i$'s stock purchases. In Column 1, which does not correct for the sports sponsorship endogeneity, the coefficient of *SportsAd* is estimated to be 0.091, with a $t$-statistic of 4.63. The implied economic effect is 0.10 bps or 47.2% of the average household stock buys (which is 0.21 bps). In Column 2, in which the sports sponsorship endogeneity is corrected, the coefficient of *SportsAd* decreases to 0.084 with a $t$-statistic of 3.20. The implied economic effect consequently drops to 0.06 bps (or 28.3% of the average). Local bias is also estimated to have an effect on the households' stock purchases. With or without the control functions, the coefficient of *LogDist* equals roughly $-0.05$ and the implied economic effect varies from $-0.02$ bps to $-0.03$ bps (i.e., from $-9.4\%$ to $-14.2\%$ of the mean).

Columns 3 and 4 refer to household $i$'s stock sales. In contrast to the estimation results in the household stock purchases, the coefficients of sports sponsorship and local bias are not found to be statistically significant. In particular, without the control functions, the estimated coefficient of *SportsAd* is $-0.026$, with a $t$-statistic of $-0.84$. When the control functions are incorporated, it becomes $-0.053$, with a $t$-stat of $-0.44$. In both cases, the negative sign indicates that the household is less likely to sell a stock that sports sponsors its city, but the $t$-statistics are low. The economic effect is also very moderate, ranging from $-8.4\%$ to $-12.1\%$ of the mean. Column 3 also shows that, without correcting for *SportsAd* endogeneity, the estimated coefficient of *LogDist* is 0.006 with a $t$-statistic of 0.98. In Column 4, which accounts for *SportsAd* endogeneity, the estimated coefficient of *LogDist* is 0.004 with a $t$-statistic of 0.33. In both cases, the economic effect of local bias is very small, varying from 2.1% to 1.3% of the mean.

The above figures show that sports sponsorship significantly affects a household's monthly

buys. They also suggest, though, that the investment biases for stocks which sports sponsor the city of residence or are based geographically close matter more for the stock purchase decision than for the decision to sell. This finding is more consistent with theories pointing to the investors' limited attention. That is, if sports sponsorship or local bias were conferring information about a stock's profitable growth prospects, then a household would have been much less inclined to sell stocks with these features.

## 5.2. Portfolio Returns

I also examine whether the household investments in the sports sponsors outperform other Russell 1000 stock holdings. The methodlogoy that I follow is analogous to the one provided by Coval and Moskowitz (2001) and Cohen, Frazzini, and Malloy (2008). In every month, I classify each household's stockholdings into two distinct (household-specific) portfolios. The first portfolio is the "Sports Sponsorship Portfolio" and consists of holdings on stocks with sports advertisement in the city where the household resides. The second portfolio is the "Other Russell 1000 Portfolio" and is comprised by holdings on stocks which do not sponsor a sports teams in the household's MSA. I rescale the portfolio weights of every household in the two aforementioned portfolios, so that, for a given household, the weights in each portfolio sum to one. Households investing in only one of the two portfolios are also kept in the analysis.

Subsequently, for every household, I calculate the returns of the two portfolios in the next month. I then average the returns of each of the two portfolios across households, using their total portfolio values as weights, in order to obtain the monthly returns of the two portfolios.[36] Having obtained the household value-weighted returns of the "Sports Sponsorship Portfolio" and the "Other Russell 1000 Portfolio", I calculate the monthly payoffs from a strategy that longs the former and shorts the latter. The results of this household holdings performance test are shown in Table 8. Panel A presents the average monthly raw return of

[36] Averaging household returns equally produces very similar results.

the strategy, while Panel B shows the corresponding Carhart 4-factor adjusted alpha.[37] In both panels, Newey-West standard errors with a lag order of 3 months are shown in brackets.

As reported in Column 1 in Panel A, the mean raw return from longing the "Sports Sponsorship Portfolio" and shorting the "Other Russell 1000 Portfolio" during the whole sample period is about 0.05%. The alpha is also very small (i.e. about 0.08%), as shown in Column 1 of Panel B. Neither the average return or the alpha are statistically significant. In Columns 2 and 3, I divide the sample into two equal sub-periods. Subsample 1 covers the period October 1992 - September 1994 and has a mean raw return of about -0.31% and an alpha of about -0.41%. On the other hand, Subsample 2 covers the period October 1994 - September 1996 with a mean raw return of approximately 0.40% and an alpha of about 0.49%. As before, in both subsamples, there is no statistical significance for the average return and the regression constant.

To better assess the above household performance figures, I examine the returns of the same strategy without conditioning on household investment or the city-specific advertisement exposure. That is, in every month, I construct the unconditional "Sports Sponsorship Portfolio", comprised by all firms that sports sponsor (without taking into account where they advertise). I compare the value-weighted return of that portfolio with the value-weighted return of the "Other Russell 1000 Portfolio".[38] The results of this unconditional performance test are depicted in Table 9.

As stated in Column 1, the mean raw return is about -0.09% with an alpha of approximately -0.04% for the whole sample period. Column 2 shows that in Subsample 1 the average return is about -0.27% and the regression constant is -0.22%. Column 3 shows that in Subsample 2 the return is on average 0.08%, while the alpha equals about 0.08% as well. There is no statistical significance in any of these figures.

For the whole sample period, the value-weighted strategy that conditions on household

[37]The Carhart four factors are obtained from Kenneth French's website at http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html.

[38]Again, very similar results are also obtained for equally-weighted portfolios.

investment seems to do better than the unconditional one (i.e. about 0.05% vs. -0.09%). In Subsample 1, the mean raw return is worse (i.e. roughly -0.31% vs. -0.27%). Yet, in Subsample 2, the average return is much higher (i.e. 0.40% vs. 0.08%), as is the alpha (i.e. 0.49% vs. 0.08%).

In a nutshell, even though the strategies that condition on household investment perform better than the unconditional ones, there is insufficient statistical evidence that firms with sports advertisement yield higher returns for the portfolio. A way to interpret this finding is that product market advertising is mainly relevant for capturing household attention and breeding familiarity than for conferring information about the prospects of a stock.

## 5.3. Directly vs. Non-Directly Recognizable Stocks

In the construction process of the sports sponsorship indicator variable, *SportsAd*, I assign the value 1 only to stocks which can be directly recognized from their product advertisement. To assess the degree to which the sports sponsorship effect on the household portfolio choice relies on this requirement, I introduce a new firm-city-specific indicator variable, namely *SportsAdDnD*, which equals 1 if the respective stock sports sponsors the corresponding city *regardless* of the firm's recognizability from product advertisement.[39] In that way, *SportsAdDnD* being equal to 1 is a necessary but not sufficient condition for *SportsAd* to equal 1 as well.[40]

I then replace the *SportsAd* with *SportsAdDnD* in Equations (1) and (6) and repeat the estimation. The results are depicted in Columns 1 and 2 of Table 11. As expected, since now a part of the sports sponsorship cannot be recognized by investors, the portfolio choice effect becomes weaker. More specifically, in Column 1, where the portfolio choice estimation does not account for the sports sponsorship endogeneity, the estimated coefficient of *SportsAdDnD* is 0.203 with a $t$-statistic of 5. The implied economic effect on the portfolio

[39]The "DnD" in *SportsAdDnD* stands for "direct or not direct" recognizability.

[40]The distribution of the non-directly recognizable sports sponsors over time is depicted in Table 10. For these stocks, $SportsAdDnD = 1$ but $SportsAd = 0$.

choice is 2.87 bps (or 36% of the mean). These figures are lower than the ones in Column 4 of Table 4. That is, with the *SportsAd* variable, the respective coefficient estimate is 0.300 and the economic effect 4.92 bps (or 61.7% of the mean).

In Column 2, where the sports sponsorship endogeneity is being taken into account with control function polynomials, the estimated coefficient of *SportsAdDnD* equals 0.152 with a $t$-statistic of 2.87 and an implied economic effect of 1.95 bps (or 24.5% of the mean). Both the coefficient estimate and the economic effect are also smaller than the ones in Column 7 of Table 6. There, with the use of *SportsAd* as the sports sponsorship variable, the coefficient is 0.262 and the implied economic effect 3.98 bps (or 50% of the mean).

For a better assessment of a firm's direct recognizability requirement, I also estimate the portfolio choice Equations (1) and (6) by including both sports sponsorship variables, i.e. both *SportsAdDnD* and *SportsAd*. That is, I now perceive *SportsAdDnD* to be another firm-city observable fundamental, which can be introduced as an additional control in the portfolio weights regression on *SportsAd*. In that way, the new estimated coefficient of *SportsAd* can be interpreted as a difference effect.

Columns 3 and 4 of Table 11 depict the new estimation results. Without controlling for *SportsAd* endogeneity via the control function method, the coefficient estimate equals 0.405, which is higher than its previous value (i.e., 0.300). The new t-statistic is 7.05 and the new economic effect is 6.72 bps (or 84.32%), which is also higher than the effect without the incorporation of *SportsAdDnD* as a control (i.e., 4.92 bps). Column 4, in turn, takes into account the endogeneity of *SportsAd*. The coefficient estimate equals 0.374 and the economic effect is 5.88 bps (or 73.8% of the mean). Again both the estimated coefficient and economic effect are larger (i.e., relative to 0.262 and 3.98 bps from the previous estimation.)

Consequently, the direct recognizability of a firm from the product advertisements is important for the sports sponsorship to have a sizable effect on the household portfolio choice. This finding is also consistent with product advertising having a main attention or familiarity effect on the household investments.

# 6. Unbundling Familiarity

So far, the paper has identified the households' over-investment in stocks that sports sponsor their cities and presented evidence that suggests that the advertising over-investment is more consistent with theories of attention and familiarity. In this section, I re-estimate the household portfolio choice with the objective of showing how product market advertising interacts with local bias.

In the spirit of Table 1, I classify stocks into four classes of assets based on the geographical proximity of their headquarters from a household's residence and the sports sponsorship in a household's city. That is, from a household's perspective, stocks can be distant without sports advertisement (i.e., $DistNAd$), local without sports advertisement (i.e., $LocNAd$), distant with sports advertisement (i.e., $DistAd$) or local with sports advertisement (i.e., $LocAd$). I then replace the individual variables of sports sponsorship and local bias in Equations (1) and (6), namely $SportsAd$ and $LogDist$, with the aforementioned dummies (keeping $DistNAd$ as the base group).

## 6.1. Portfolio Demand

Table 12 depicts the new estimation results of the household portfolio choice. In Columns 1 and 2, stocks are characterized as local if their headquarters' ZIP Code is at most 250 miles away from a household's residential ZIP Code. Similarly, in Columns 3 and 4, stock locality is based on a 100-mile radius from the household's residential ZIP Code.

Across all columns, households are estimated to have the strongest preferences for stocks that are both local and sports sponsors of their residence city. Specifically, in Columns 1 and 3, where the endogeneity of sports sponsorship is not taken into account, the coefficient of $LocAd$, is estimated to be 0.767 for the 250 miles locality threshold and 0.846 for the 100 miles locality threshold. The corresponding economic effects are 24.04 bps (i.e., 301.6% of the mean) or 31.27 bps (i.e., about 392.4% of the mean). Furthermore, in Columns 2 and

4, which account for the sports sponsorship endogeneity via the control function method, the coefficient of *LocAd* is decreased to 0.705 for the 250 miles locality threshold and 0.790 for the 100 miles locality threshold. The respective economic effects become 21.45 bps (or 269.1% of the mean) or 26.62 bps (or 334.0% of the mean).

In all the above cases, the estimated coefficient of *LocAd* is about twice as much higher than the coefficient of *LocNAd*, while the economic effect of the former is approximately 20 bps (i.e., 250% of the mean) higher than the economic effect of the latter.[41] That is, the familiarity from product market advertising drastically increases the the local bias that household exhibits.

As regards to the evaluation of the impact of sports advertising that non-local firms make, the coefficient of *DistAd* across all columns is roughly 0.3, with an implied economic effect of roughly 40%, when taking into account the sports sponsorship endogeneity. That effect is big and shows that, by sports sponsoring a given city, firms with distant headquarters are more likely to be included (with a higher share) in that city's household portfolios.

In fact, it is possible that the sports sponsorship portfolio effect of distant firm can overpower the local bias for firms which do not sponsor a local team in the city where the household lives. Whether it actually does it or not depends on the distance threshold based on which a stock's locality is defined. In particular, for the threshold of 250 miles, distant stocks that sports sponsor a city are included with a higher probability and with a larger share in the portfolios of the city's households than local stocks that do not sponsor sponsor. In contrast, for the distance threshold of 100 miles, the situation is reversed.

In more detail, when a stock's locality is defined within a 250-mile radius from a household's residential ZIP Code and the sports sponsorship endogeneity is not corrected, the estimated coefficient of *DistAd* is 0.340 with an implied economic effect 4.74 bps (or 59.5% of the average portfolio weight). The estimated coefficient of *LocNAd*, on the other hand, is

[41] More precisely, accounting for the endogeneity of *SportsAs* and considering stocks headquartered at most 250 miles away from a household's residential ZIP Code to be local, leads to a portfolio weight increase of $21.45 - 1.8 = 19.65$ bps. Analogously, for the 100-mile locality threshold, the portfolio weight increase equals $26.62 - 6.44 = 20.18$ bps.

estimated to be 0.268, with an implied economic effect of 2.77 bps (or 34.8% of the mean). The higher magnitude of $DistAd$'s impact vs. $LocNAd$'s impact is maintained, when I also account for $SportsAd$ endogeneity. In that case, the estimated coefficient of $DistAd$ drops to 0.296, while the coefficient of $LocNAd$ drops to 0.206. The economic effect for distant stocks that sports sponsor a household's city is 3.46 bps (or 43.4% of the mean), while, for local stocks which do not sports sponsor, it is 1.8 bps (or 22.6% of the mean).

For the distance threshold of 100 miles, the coefficient of $DistAd$ is 0.322 and 0.284, in the $SportsAd$ corrected and uncorrected case respectively. The corresponding economic effects are 4.63 bps (or 58.1% of the mean) and 3.17 bps (or 39.8% of the mean). Both coefficients and effects are now lower than the ones of $LocNAd$. The coefficient of $LocNAd$ equals 0.468 without the sports sponsorship endogeneity correction and 0.373 with the correction. The respective economic effects are 8.23 bps (or 103.3% of the mean) and 6.44 bps (or 80.8% of the mean).

## 6.2. Portfolio Diversification

Besides the effect on the household portfolio demand, I also explicitly examine the effect of product market advertising and local bias on the household portfolio (under-)diversification. In the spirit of Brandt, Santa-Clara, and Valkanov (2009), I replace the Tobit Equation (1) with the following linear regression:

$$w_{i,c,j} - w_j^{VW} = \alpha^{dev} + \beta_1^{dev} LocNAd_{c,j} + \beta_2^{dev} DistAd_{c,j} + \beta_3^{dev} LocAd_{c,j} + Controls_{i,c,j} + \tilde{\epsilon}_{i,c,j}^{dev} \quad (8)$$

where the dependent variable in the LHS of Equation (8) is the deviation of household $i$'s portfolio weight on stock $j$ from the value-weighted portfolio weight on that stock. The list of control variables is the same as before. The endogeneity of sports sponsorship in this case can also be corrected by following the same control function approach. In principle, under this

new specification, the estimated coefficients can be directly interpreted as investment biases towards stocks with certain features. Equivalently, under the CAPM null, their coefficients should be equal to zero.

The estimated results of the household portfolio diversification are presented in Table 13. Overall, the same message is conferred as in Table 12. That is, regardless of the distance threshold for a stock's locality and the correction for the sports sponsorship endogeneity, households are expected to deviate from CAPM and overload their portfolios on stocks which sports sponsor their cities and are local.

More analytically, for the distance threshold of 250 miles and without accounting for the $SportsAd$ endogeneity, the coefficient of $DistAd$ equals 10.54 bps, thus being higher than the estimated coefficient of $LocNAd$, which is 9.39 bps. When the endogeneity of sports sponsorship is taken into account, the comparison of the two effects does not change. The coefficient of $DistAd$ decreases to 8.75 bps, but the coefficient of $LocNAd$ decreases to 6.53.

In contrast, for the distance threshold of 100 miles, the coefficient of $LocNAd$ is estimated to be higher than the one of $DistAd$. Without correcting for $SportsAd$ endogeneity, $LocNAd$ has an estimated effect of 17.14 bps, while $DistAd$ has an effect 12.45 bps. Once control functions are introduced in the regression, the effect of $LocNAd$ drops to 15.23 bps and the effect of $DistAd$ to 5.05 bps.

Moreover, for the distance threshold of 250 miles, the coefficient of $LocAd$ equals 69.65 bps without the $SportsAd$ endogeneity correction and 46.16 bps with the $SportsAd$ endogeneity correction. For the distance threshold of 100 miles, the corresponding coefficients equal 84.96 bps and 62.81 bps respectively. Therefore, with the incorporation of the control functions, there is an increase in the household over-investment in local stocks ranging from $46.16 - 6.53 = 39.63$ bps to $62.81 - 15.23 = 47.58$ bps due to sports sponsorship.

# 7. Conclusion

Product market advertising increases a firm's visibility to consumers as well as to investors. However, the general unavailability of data on the exposure of investors to commercials poses challenges to the identification of the advertising effect on the portfolio choice. To overcome this issue, in this paper, I construct a dataset on the major league sports sponsorships of publicly listed firms, which I then merge with retail investment data from a large national discount broker.

I find that, even under the acknowledged presence of local equity preferences, a household's portfolio weight on a stock increases, if the stock sports sponsor the household's residence city. Sports sponsorship matters more for the household's stock purchase decisions than for the household's stock-selling decisions. Like local bias, it has a mute effect on the household's portfolio returns. Moreover, the effect of sports sponsorship on the portfolio choice is sizable, provided that the stock can be directly recognized from the product advertisement. Thus, theories that attribute the household over-investment in stocks that advertise to limited attention and familiarity are more consistent with data.

I also study how sports sponsorship interacts with local bias. I show that the household portfolio over-investment in local stocks can largely increase, if local stocks sports sponsor a local team. But more importantly, with sports sponsorships, the portfolio share on distant firms increases substantially. The sports advertising effect for a distant firm can actually beat the local bias for a firm that is based within a 250-mile radius from the household's residence but does not sports sponsor.

In regard to future research, the extension of this study to accommodate the advertising of mutual funds (e.g., Barber, Odean, and Zheng (2005), Cronqvist (2006)) seems promising. Quite a few mutual funds (e.g., Fidelity, Putnam Investments, etc.) engage in sports marketing activities as they seek to increase their clientéle. Incorporating the city-fund sports sponsorship exposure in a household mutual fund demand framework is a feasible task.

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Table 1: Sports Advertising and Local Bias in Household Stock Portfolios

This table summarizes the sports advertising over-investment and local bias in the stock holdings of households in the data. Panel A describes the local bias for stocks whose headquarters' ZIP Code lies within a 100-mile radius from a household's residential ZIP Code. Column 1A (Average Percentage of Sports Advertising in the Household Portfolio) reports the average share of a household stock-portfolio in firms that sports sponsor the household's residence city. It is computed as $\frac{1}{I}\sum_i \sum_j w_{i,c,j} SportsAd_{c,j}$, where $SportsAd_{c,j}$ is an indicator variable equal to 1 if firm $j$ sponsors a sports team in city $c$ where household $i$ resides, $w_{i,j}$ is household $i$'s portfolio weight on stock $j$, and $I$ is the total number of households. Column 1B (Average Percentage of Sports Advertising in Excess of the Market) reports the difference between the average share of a household stock-portfolio in firms that sports sponsor the household's residence city and the average share of a value-weighted benchmark portfolio in the same stocks. It is computed as the difference between Column 1A and the average $\frac{1}{I}\sum_i \sum_j w_j^{VW} SportsAd_{c,j}$, where $w_j^{VW}$ is a value-weighted benchmark portfolio weight on stock $j$ based on the definition of the investment universe (and $SportsAd_{c,j}$ and $I$ are as in Column 1A). The average $t$-statistic of the difference is also reported in the same column [in brackets]. Columns 2C and 2D are analogous to Columns 1A and 1B, but refer to firms which do *not* sports sponsor the household's residence city (replacing $SportsAd_{c,j}$ with $1 - SportsAd_{c,j}$ in the above formulas). Column 3 refers exclusively to local bias, summing up Column 1A with Column 2C, and Column 1B with Column 2D. In Panel's A Row 1, the summation formula is applied only to firms whose headquarters' ZIP Code is insides a 100-mile radius from the household's residential ZIP Code. In Panel's A Row 2, the summation formula is applied only to firms whose headquarters' ZIP Code is outside a 100-mile radius from the household's residential ZIP Code. Analogously, Panel B describes the local bias for stocks whose headquarters' ZIP Code lies within a 250-mile radius from a household's ZIP Code residence. The sample period is from September 1992 until August 1996. The universe of firms is comprised by the publicly traded Primary Sports Sponsors and all the stocks that were ever included in Russell 1000 index during the sample period.

Panel A: Sports Advertising and Local Bias in 100 miles

| | (1) SportsAd | | (2) No SportsAd | | (3) TOTAL | |
|---|---|---|---|---|---|---|
| Av. % of | Household Portfolio (A) | In Excess of Market (B) | Household Portfolio (C) | In Excess of Market (D) | Household Portfolio (A)+(C) | In Excess of Market (B)+(D) |
| $\leq$ 100 miles | 5.3 | +4.1 [21.6] | 15.8 | +10.6 [35.5] | 21.1 | +14.7 [43.5] |
| $>$ 100 miles | 6.4 | +1.3 [7.1] | 72.5 | -16 [-44.6] | 78.9 | -14.7 [-43.5] |
| TOTAL | 11.7 | +5.4 [21.3] | 88.3 | -5.4 [-21.3] | 100 | 0 |

Panel B: Sports Advertising and Local Bias in 250 miles

| | (1) SportsAd | | (2) No SportsAd | | (3) TOTAL | |
|---|---|---|---|---|---|---|
| Av. % of | Household Portfolio (A) | In Excess of Market (B) | Household Portfolio (C) | In Excess of Market (D) | Household Portfolio (A)+(C) | In Excess of Market (B)+(D) |
| $\leq$ 250 miles | 6.1 | +4.5 [22.3] | 22 | +11.4 [33.9] | 28.1 | +15.9 [43] |
| $>$ 250 miles | 5.6 | +0.9 [5.4] | 66.3 | -16.8 [-44] | 71.9 | -15.9 [-43] |
| TOTAL | 11.7 | +5.4 [21.3] | 88.3 | -5.4 [-21.3] | 100 | 0 |

Table 2: Distribution of the Directly-Recognizable Publicly Traded Primary Sports Sponsors over Time

This table describes the distribution of the directly-recognizable publicly traded Primary Sports Sponsors over time. In every sports season, the publicly traded sports sponsors are identified from merging the Primary Sports Sponsors listed in the Sports Sponsor FactBook of Team Marketing Report (issued in 1993, 1994, 1995 and 1996) with the history files of CRSP. Directly-recognizable sponsors are sponsors which displayed their company name or logo in their product advertisement. (For a description of the distribution of the Non-Directly-Recognizable Publicly Traded Primary Sports Sponsors see Table 10.) Row 1 refers to their total number. Row 2 refers to their membership in Russell 1000. Row 3 refers to whether their securities are American depository receipts (ADR's). Rows 4-18 refer to their industrial classification based on their assignment in one of the 17 Fama-French industry portfolios. (The number of the respective industry portfolio is shown in parenthesis.) Food stands for food. Mines stands for mining and minerals. Oil stands for oil and petroleum products. Clths stands for textiles, apparel and footware. Durbl stands for consumer durables. Chems stands for chemicals. Cnsum stands for drugs, soap, perfumes and tobacco. Cnstr stands for construction and construction materials. FabPr stands for fabricated products. Machn stands for machinery and business equipment. Cars stands for automobiles. Trans stands for transportation. Rtail stands for retail stores. Finan stands for banks, insurance companies, and other financials. OthSvc stands for other and services. Due to lack of participation, the industry portfolios of Steel (9, i.e steel works etc.) and Utils (14, i.e. utilities) are not being displayed. Row 19 refers to the average number of Metropolitan Statistical Areas (MSA's) in which a publicly traded sponsor advertises and Row 20 refers to the median.

| | Sports Season | | | |
|---|---|---|---|---|
| | 1992-1993 | 1993-1994 | 1994-1995 | 1995-1996 |
| Num. of Firms | 167 | 166 | 175 | 174 |
| Russell 1000 | 116 | 118 | 120 | 115 |
| ADRs | 18 | 15 | 17 | 16 |
| Food (1) | 17 | 19 | 17 | 14 |
| Mines (2) | 1 | 1 | 2 | 1 |
| Oil (3) | 17 | 15 | 14 | 14 |
| Clths (4) | 5 | 5 | 7 | 7 |
| Durbl (5) | 11 | 10 | 9 | 8 |
| Chems (6) | 1 | 0 | 2 | 2 |
| Cnsum (7) | 8 | 4 | 3 | 3 |
| Cnstr (8) | 4 | 5 | 4 | 3 |
| FabPr (10) | 1 | 1 | 0 | 0 |
| Machn (11) | 10 | 10 | 10 | 11 |
| Cars (12) | 10 | 8 | 8 | 8 |
| Trans (13) | 15 | 16 | 17 | 18 |
| Rtail (15) | 26 | 30 | 27 | 33 |
| Finan (16) | 18 | 18 | 31 | 29 |
| OthSvc (17) | 23 | 24 | 24 | 23 |
| Av. MSAs | 3.42 | 3.89 | 4.28 | 4.11 |
| Med. MSAs | 2 | 2 | 3 | 3 |

Table 3: Summary Statistics

This table reports the summary statistics of all the variables in the sample. Panel A refers to the household stock holdings. Portval is the portfolio value of a household. Numstk is the number of stocks that a household holds. Portwt is the portfolio weight of a household on a stock at the extensive margin (i.e. without conditioning on the household's positive positions). Panel B refers to the stock geographical proximity and sports advertisement in the investment universe. Dist is the distance between a household's address ZIP code and the address ZIP code of a stock's headquarters. LogDist is the log of Dist. Away250m (Away100m) is an indicator variable equal to 1 if a stock is headquartered more than 250 miles (100 miles) away from a household's residence. SportsAd is an indicator variable equal to 1 if a stock sponsors a sports team in the city of a household's residence and is directly recognizable by displaying the company name or logo in the product advertisement. Panel C shows the demographics of the households in the sample. Income is the income level. LogIncome is the log of Income. Age is the age of the household head. LogAge is the log of Age. Male is an indicator variable equal to 1 to if the head of a household is a male. FamSize is the number of members of a household. LogFamSize is the log of FamSize. Educ is the percentage of the household's ZIP Code population that holds a bachelor's or higher degree. White, Black, Hispanic, AsianOther are respectively the percentages of the household's ZIP Code population that are white, black, Hispanic and Asian or of other race. ProfProxim is the professional industrial proximity to a stock of the household's ZIP Code population. Panel D shows the demographics of the 71 Metropolitan Statistical Areas (MSAs) that were in the market for a sports team. in which households reside. Sportsteam is an indicator variable equal to 1 if the MSA has a team in the four major league sports, Pop is the population number, LogPop is the log of population, IncPerCap is the income per capita, LogIncPerCap is the log of IncPerCap, MedHome is the median home value, LogMedHome is the log of MedHome,Unemp is the unemployment rate. Panel E refers to the total advertising expenditure in the stocks' industries, as these are defined by the 17 Fama-French industry portfolios. Column 1 shows the average frequency of the industries in the sample. Column 2 shows the time-series average of their total advertising expenses (InduAD). Column 3 ranks the total advertising expenses of the industries in decreasing order (from 1 to 17). Panel F refers to the advertising expenditure of the stocks and Panel G shows their financial characteristics. For every financial characteristic, the summary statistics of the Sports Sponsors and the other firms in Russell 1000 are also depicted separately. Price is the price of a stock. Size is the market capitalization. LogSize is the log of Size. Book/Market is the book-to-market ratio. Turnover is the share turnover ratio. Momentum is the past 12-month return. Volatility is the volatility of the monthly returns in the past 12 months. Profitability is the ratio of past annual gross profits to assets. Investment is the past annual growth rate of assets. Sales is the past annual sales. LogSales is the log of Sales. The universe of stocks is comprised by the publicly traded Primary Sports Sponsors and all the stocks that were ever included in the Russell 1000 index during the sample period. The sample period is from September 1992 until August 1996.

Panel A: Household Stock Holdings

| | Mean | S.D. | Median | Min | Max |
|---|---|---|---|---|---|
| Portval ($ thous.) | 38.44 | 143.36 | 13.30 | 1.00 | 11,990.15 |
| Numstk | 2.73 | 2.78 | 1.92 | 1 | 64 |
| Portwt | 7.97 bps | 234.58 bps | 0 | 0 | 1 |

Panel B: Stock Geographical Proximity and Sports Advertisement

| | Mean | S.D. | Median | Min | Max |
|---|---|---|---|---|---|
| Dist (stat. miles) | 920.54 | 604.01 | 804.55 | 0 | 2,074.67 |
| LogDist | 6.43 | 1.16 | 6.69 | 0 | 7.64 |
| Away250m | 0.84 | 0.36 | 1 | 0 | 1 |
| Away100m | 0.93 | 0.26 | 1 | 0 | 1 |
| SportsAd | 0.02 | 0.14 | 0 | 0 | 1 |

Table Cont'd: Summary Statistics

Panel C: Household Demographics

| | Mean | S.D. | Median | Min | Max |
|---|---|---|---|---|---|
| Income ($ thous.) | 93.43 | 64.67 | 87.50 | 10.00 | 250.00 |
| LogIncome | 11.23 | 0.68 | 11.38 | 9.21 | 12.43 |
| Age | 54.04 | 14.00 | 50 | 21 | 80 |
| LogAge | 3.96 | 0.26 | 3.91 | 3.04 | 4.38 |
| Male | 0.89 | 0.32 | 1 | 0 | 1 |
| FamSize | 2.47 | 1.24 | 2 | 1 | 6 |
| LogFamSize | 0.78 | 0.5 | 0.69 | 0 | 1.79 |
| Educ | 0.36 | 0.15 | 0.36 | 0 | 0.91 |
| White | 0.81 | 0.18 | 0.86 | 0.01 | 1 |
| Black | 0.06 | 0.11 | 0.02 | 0 | 0.98 |
| Hispanic | 0.07 | 0.09 | 0.04 | 0 | 0.94 |
| AsianOther | 0.06 | 0.08 | 0.04 | 0 | 0.62 |
| ProfProxim | 0.08 | 0.06 | 0.07 | 0 | 0.76 |

Panel D: MSA Demographics

| | Mean | S.D. | Median | Min | Max |
|---|---|---|---|---|---|
| Sportsteam | 0.53 | 0.50 | 1 | 0 | 1 |
| Pop (mil.) | 2.07 | 2.66 | 1.20 | 0.26 | 17.70 |
| LogPop | 14.08 | 0.92 | 14.00 | 12.46 | 16.69 |
| IncPerCap ($ thous.) | 23.80 | 3.02 | 23.32 | 17.98 | 34.77 |
| LogIncPerCap | 3.16 | 0.12 | 3.15 | 2.89 | 3.55 |
| MedHome ($ thous.) | 97.25 | 30.36 | 89.84 | 50.60 | 215.11 |
| LogMedHome | 11.44 | 0.29 | 11.41 | 10.83 | 12.28 |
| UnempRate (%) | 5.17 | 1.43 | 5.00 | 2.28 | 10.35 |

Panel E: Industry Advertisement Expenditure

| | Av. Frequency (%) | Av. InduAD ($ mil.) | Av. Ranking (1 to 16) |
|---|---|---|---|
| Food (1) | 4.07 | 14,627.64 | 2 |
| Mines (2) | 1.54 | 40.28 | 16 |
| Oil (3) | 4.69 | 288.65 | 13 |
| Clths (4) | 1.99 | 1,816.33 | 10 |
| Durbl (5) | 2.66 | 7,200.11 | 6 |
| Chems (6) | 2.71 | 1,099.18 | 12 |
| Cnsum (7) | 4.33 | 14,042.03 | 3 |
| Cnstr (8) | 2.3 | 1,965.53 | 9 |
| Steel (9) | 1.63 | 145.43 | 14 |
| FabPr (10) | 0.92 | 52.56 | 15 |
| Machn (11) | 10.12 | 5,490.65 | 7 |
| Cars (12) | 1.95 | 13,193.14 | 4 |
| Trans (13) | 3.93 | 1,536.9 | 11 |
| Utils (14) | 7.81 | 0.04 | 17 |
| Rtail (15) | 7.95 | 10,644.09 | 5 |
| Finan (16) | 17.32 | 3,396.64 | 8 |
| OthSvc (17) | 24.08 | 15,441.5 | 1 |

Table Cont'd: Summary Statistics

| Panel F: Firm Advertisement Expenditure | | | | | | |
|---|---|---|---|---|---|---|
| | | Mean | S.D. | Median | Min | Max |
| AD ($ mil.) | All | 219.27 | 435.92 | 59.36 | 0.07 | 3,724 |
| | Sports Sponsors | 374.77 | 559.08 | 158.98 | 0.19 | 3,724 |
| | Others | 149.75 | 345.84 | 35.00 | 0.07 | 3,358 |
| Panel G: Financial Characteristics of Stocks | | | | | | |
| | | Mean | S.D. | Median | Min | Max |
| Price ($) | All | 34.79 | 24.37 | 30.13 | 0.05 | 739.75 |
| | Sports Sponsors | 40.62 | 26.93 | 36.25 | 0.05 | 261.25 |
| | Others | 33.89 | 23.83 | 29.63 | 0.19 | 739.75 |
| Size ($ mil.) | All | 3,522.47 | 7,676.05 | 1,293.31 | 0.70 | 144,224.20 |
| | Sports Sponsors | 9,832.16 | 15,726.51 | 3,628.3 | 0.70 | 144,224.20 |
| | Others | 2,548.10 | 4,768.07 | 1,216.68 | 0.79 | 86,346.17 |
| LogSize | All | 7.26 | 1.31 | 7.16 | -0.36 | 11.88 |
| | Sports Sponsors | 7.77 | 2.14 | 8.2 | -0.36 | 11.88 |
| | Others | 7.19 | 1.11 | 7.1 | -0.23 | 11.37 |
| Book/Market | All | 6.07 | 113.41 | 0.47 | -65.58 | 5,161.78 |
| | Sports Sponsors | 28.34 | 244.4 | 0.51 | -6.84 | 4,040.82 |
| | Others | 2.63 | 74.4 | 0.46 | -65.58 | 5,161.78 |
| Turnover | All | 0.10 | 0.13 | 0.06 | 0 | 4.55 |
| | Sports Sponsors | 0.09 | 0.13 | 0.06 | 0 | 4.55 |
| | Others | 0.10 | 0.14 | 0.05 | 0 | 2.95 |
| Momentum | All | 0.10 | 0.60 | 0.05 | -0.93 | 46.16 |
| | Sports Sponsors | 0.07 | 0.36 | 0.05 | -0.82 | 4.78 |
| | Others | 0.11 | 0.62 | 0.05 | -0.93 | 46.16 |
| Volatility | All | 0.08 | 0.05 | 0.07 | 0 | 1.07 |
| | Sports Sponsors | 0.08 | 0.04 | 0.07 | 0 | 0.58 |
| | Others | 0.08 | 0.05 | 0.07 | 0 | 1.07 |
| Profitability | All | 0.33 | 0.27 | 0.27 | -1.39 | 2.11 |
| | Sports Sponsors | 0.35 | 0.27 | 0.28 | -0.03 | 1.39 |
| | Others | 0.33 | 0.27 | 0.27 | -1.39 | 2.11 |
| Investment | All | 0.19 | 0.58 | 0.08 | -0.84 | 31.29 |
| | Sports Sponsors | 0.13 | 0.51 | 0.06 | -0.64 | 10.95 |
| | Others | 0.20 | 0.59 | 0.08 | -0.84 | 31.29 |
| Sales ($ mil.) | All | 3,955.30 | 9,726.78 | 1,236.99 | 0 | 16,5370.20 |
| | Sports Sponsors | 13,732.73 | 21,312.17 | 6,514.07 | 0 | 165,370.20 |
| | Others | 2,445.43 | 4,695.12 | 1,070.59 | 0 | 78,069.20 |
| LogSales | All | 7.12 | 1.56 | 7.12 | 0 | 12.02 |
| | Sports Sponsors | 8.35 | 2.02 | 8.78 | 0 | 12.02 |
| | Others | 6.93 | 1.38 | 6.98 | 0 | 11.27 |

Table 4: Tobit Estimation of Household Portfolio Choice, No Correction for SportsAd Endogeneity

This table presents the estimation results from four Tobit models of household portfolio choice without correcting for the endogeneity of Sports Advertising (SportsAd). The estimation is performed in a panel of households and stocks for every month separately. Panel A presents the averages of the monthly coefficient estimates and the average $t$-statistics [shown in brackets] based on standard errors clustered at the household and city level. The dependent variable is $w_{i,c,j}$, the portfolio weight of household $i$ residing in city $c$ on stock $j$. The key explanatory variables are SportsAd, i.e. an indicator variable equal to 1 if stock $j$ sponsors a sports team in city $c$ (where household $i$ resides) and LogDist, i.e. the log of the distance between household $i$'s ZIP Code and the ZIP Code of stock $j$'s headquarters. Other variables include controls for household demographics (added in Column 2), stock characteristics (added in Column 3), and MSA demographics (added in Column 4). The household demographic controls refer to household $i$ and include: the log of the household's income (LogIncome), the log of the age (LogAge) of the household's head, the log of the family size (LogFamSize) of the household and an indicator variable equal to one if the household has a male head (Male). They also contain the percentage of the household's ZIP Code population that holds a bachelor's or higher degree (Educ), the percentages of the household's ZIP Code population that are Black (Black), Hispanic (Hispanic) or Asian or other race (AsianOther) (with the base group being the percentage of the population that is White) and the professional industrial proximity to stock $j$ of the household's ZIP Code population (ProfProxim). The stock characteristics refer to stock $j$ and consist of: the log of market capitalization (LogSize), the book-to-market ratio (Book/Market), the monthly turnover ratio (Turnover), the past annual return (Momentum), the standard deviation of monthly returns in the past year (Volatility), the ratio of past annual gross profits to assets (Profitability), the past annual growth rate of assets (Investment), the log of past annual sales (LogSales) and the interaction of the log of market capitalization (LogSize) with the log of the total advertisement expenses in the industry of the stock (LogInduAD). They also include industry indicator variables based on the assignment of stock $j$ in one of the 17 Fama-French industry portfolios. Controls for MSA demographics refer to city $c$ (where household $i$ resides) and include: the log of the population number (LogPop) of city $c$, the log of the income per capita (LogIncPerCap), the log of the median home price (LogMedHome) and the unemployment rate (UnempRate). The estimated values of the constant and the standard deviation of the normal error in the Tobit regressions are not reported for brevity. Panel B presents the average marginal effects of SportsAd and LogDist on $w_{i,c,j}$ in basis points and as percentage of the mean. The sample period is from September 1992 until August 1996. The universe of stocks is comprised by the publicly traded Primary Sports Sponsors and all the stocks that were ever included in the Russell 1000 index during the sample period. Households reside in 71 MSAs which were in the market for a sports team.

| Panel A: Coefficient Estimates in Portfolio Weight | | | | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| SportsAd | 0.682 | 0.680 | 0.294 | 0.300 |
| | [14.81] | [15.02] | [7.06] | [7.69] |
| LogDist | -0.122 | -0.121 | -0.120 | -0.127 |
| | [-5.72] | [-5.81] | [-5.60] | [-6.27] |
| LogIncome | | 0.028 | 0.027 | 0.028 |
| | | [4.92] | [4.71] | [5.14] |
| LogAge | | 0.184 | 0.188 | 0.189 |
| | | [10.88] | [11.59] | [12.13] |
| LogFamSize | | -0.007 | -0.007 | -0.006 |
| | | [-0.72] | [-0.83] | [-0.60] |
| Male | | 0.036 | 0.037 | 0.036 |
| | | [3.31] | [3.63] | [3.61] |
| Educ | | 0.124 | 0.112 | 0.160 |
| | | [3.33] | [3.29] | [5.09] |
| Black | | 0.023 | 0.018 | 0.044 |
| | | [0.53] | [0.39] | [1.19] |
| Hispanic | | 0.076 | 0.076 | 0.105 |
| | | [1.18] | [1.16] | [1.56] |
| AsianOther | | 0.066 | 0.033 | 0.034 |
| | | [0.93] | [0.45] | [0.59] |
| ProfProxim | | 0.418 | 0.283 | 0.212 |
| | | [2.28] | [3.16] | [2.88] |
| LogSize | | | 0.122 | 0.121 |
| | | | [6.80] | [6.59] |

Table 4 Cont'd: Tobit Estimation of Household Portfolio Choice, No Correction for SportsAd Endogeneity

| Panel A Cont'd: Coefficient Estimates in Portfolio Weight | | | | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| Book/Market | | | 0.000 | 0.000 |
| | | | [0.69] | [0.57] |
| Turnover | | | 0.407 | 0.398 |
| | | | [12.20] | [11.58] |
| Momentum | | | -0.130 | -0.130 |
| | | | [-10.35] | [-10.38] |
| Volatility | | | 3.075 | 3.066 |
| | | | [25.66] | [25.66] |
| Profitability | | | 0.017 | 0.016 |
| | | | [0.80] | [0.76] |
| Investment | | | -0.041 | -0.041 |
| | | | [-4.37] | [-4.37] |
| LogSales | | | 0.024 | 0.025 |
| | | | [2.68] | [2.82] |
| LogSize × LogInduAD | | | 0.021 | 0.021 |
| | | | [12.20] | [11.76] |
| LogPop | | | | -0.047 |
| | | | | [-3.78] |
| LogIncPerCap | | | | -0.323 |
| | | | | [-2.71] |
| LogMedHome | | | | 0.087 |
| | | | | [2.05] |
| UnempRate | | | | 0.003 |
| | | | | [0.49] |
| Sportsteam | | | | 0.063 |
| | | | | [3.50] |
| Industry FE | NO | NO | YES | YES |
| Av. Households | 9,462 | 9,462 | 9,462 | 9,462 |
| Av. Stocks | 1,256 | 1,256 | 1,256 | 1,256 |

| Panel B: Average Marginal Effects on Portfolio Weight in Basis Points and as Percentage of the Mean | | | | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| SportsAd | 32.46 | 32 | 4.79 | 4.92 |
| | 407.3% | 401.5% | 60.1% | 61.7% |
| LogDist | -2.31 | -2.27 | -1.26 | -1.33 |
| | -29.0% | -28.5% | -15.8% | -16.7% |

Table 5: First-Stage Probit Estimation of Firm Sports Advertising

This table presents the estimation results from three first-stage probit models of firm sports advertising. The estimation is performed in a panel of firms and cities for every year separately. Panel A presents the averages of the annual coefficient estimates and their $t$-statistics [shown in brackets] based on standard errors clustered at the firm and city level. The dependent variable is SportsAd, a dummy equal to 1 if firm $j$ sponsors a sports team in city $c$. The key explanatory variable is Sportsteam×(LogSize×LogInduAD), i.e. the interaction of an indicator variable equal to 1 if city $c$ has a sports team (Sporteam) in MLB, NBA, NFL or NHL and the interaction of the log of the market capitalization (LogSize) of firm $j$ with the log of the total advertisement expenses in the industry (LogInduAD) of firm $j$. Firm industries are defined based on the assignment of their stocks in the 17 Fama-French industry portfolios. Column 2 adds as controls the log of average distance (LogDist) between the ZIP Code of firm $j$'s headquarters and the ZIP Codes of city $c$, firm $j$'s log of market capitalization (LogSize) and the log of the total advertisement expenses in the industry (LogInduAD) of firm $j$. Column 3 adds as additional controls the MSA demographics of city $c$. These include: the log of the population number (LogPop), the log of the income per capita (LogIncPerCap), the log of the median home price (LogMedHome) and the unemployment rate (UnempRate). Panel B shows the economic effect of Sportsteam×(LogSize×LogInduAD) on SportsAd in basis points and as percentage of the mean, defined as the corresponding marginal effect times a 1 standard deviation increase. The sample period is from September 1992 until August 1996. The universe of stocks is comprised by the publicly traded Primary Sports Sponsors and all the stocks that were ever included in the Russell 1000 index during the sample period. The set of cities consists of 71 MSAs which were in the market for a sports team.

| Panel A: Coefficient Estimates of SportsAd | | | |
|---|---|---|---|
| | (1) | (2) | (3) |
| Sportsteam × $\underbrace{\text{LogSize} \times \text{LogInduAD}}_{\text{Advertising Propensity}}$ | 0.022 | 0.035 | 0.031 |
| | [9.8] | [4.53] | [3.12] |
| LogDist | | -0.228 | -0.219 |
| | | [-8.17] | [-8.63] |
| LogSize | | -0.092 | -0.058 |
| | | [-1.04] | [-0.42] |
| LogInduAD | | -0.15 | -0.132 |
| | | [-2.72] | [-1.71] |
| LogPOP | | | 0.300 |
| | | | [6.05] |
| LogIncPerCap | | | -0.447 |
| | | | [-1.21] |
| LogMedHome | | | 0.251 |
| | | | [1.87] |
| UnempRate | | | -0.055 |
| | | | [-1.91] |
| Constant | -3.441 | -1.738 | -7.58 |
| | [-22.67] | [-3.32] | [-4.52] |
| Av. Stocks | 1,256 | 1,256 | 1,256 |
| Av. Cities | 71 | 71 | 71 |

| Panel B: Econ. Effect on SportsAd in Basis Points and as Percentage of the Mean | | | |
|---|---|---|---|
| | (1) | (2) | (3) |
| Sportsteam × $\underbrace{\text{LogSize} \times \text{LogInduAD}}_{\text{Advertising Propensity}}$ | 55.5 | 35 | 21.5 |
| | 51.6% | 32.5% | 20.0% |

Table 6: Tobit Estimation of Household Portfolio Choice, With Correction for SportsAd Endogeneity

This table presents the estimation results from eight Tobit models of household portfolio choice correcting for the endogeneity of Sports Advertising (SportsAd) using a control function method. The estimation is performed in a panel of households and stocks for every month separately. Panel A presents the averages of the monthly coefficient estimates and the average $t$-statistics [shown in brackets] based on standard errors clustered at the household and city level. The dependent variable is $w_{i,c,j}$, the portfolio weight of household $i$ residing in city $c$ on stock $j$. The key explanatory variables are SportsAd, i.e. an indicator variable equal to 1 if stock $j$ sponsors a sports team in city $c$ (where household $i$ resides) and LogDist, i.e. the log of the distance between household $i$'s ZIP Code and the ZIP Code of stock $j$'s headquarters. In the odd-numbered columns (i.e. Columns 1, 3, 5 and 7), the correction functions $\Psi_0$ and $\Psi_1$ are approximated quadratically. In the even-numbered columns (i.e. Columns 2, 4, 6 and 8), the correction functions $\Psi_0$ and $\Psi_1$ are approximated cubicly. Other variables include controls for household demographics (added in Columns 3,4), stock characteristics (added in Columns 5,6), and MSA demographics (added in Columns 7,8). The household demographic controls refer to household $i$ and include: the log of the household's income (LogIncome), the log of the age (LogAge) of the household's head, the log of the family size (LogFamSize) of the household and an indicator variable equal to one if the household has a male head (Male). They also contain the percentage of the household's ZIP Code population that holds a bachelor's or higher degree (Educ), the percentages of the household's ZIP Code population that are Black (Black), Hispanic (Hispanic) or Asian or other race (AsianOther) (with the base group being the percentage of the population that is White) and the professional industrial proximity to stock $j$ of the household's ZIP Code population (ProfProxim). The stock characteristics refer to stock $j$ and consist of: the log of market capitalization (LogSize), the book-to-market ratio (Book/Market), the monthly turnover ratio (Turnover), the past annual return (Momentum), the standard deviation of monthly returns in the past year (Volatility), the ratio of past annual gross profits to assets (Profitability), the past annual growth rate of assets (Investment), the log of past annual sales (LogSales) and the interaction of the log of market capitalization (LogSize) with the log of the total advertisement expenses in the industry of the stock (LogInduAD). They also include industry indicator variables based on the assignment of stock $j$ in one of the 17 Fama-French industry portfolios. Controls for MSA demographics refer to city $c$ (where household $i$ resides) and include: the log of the population number (LogPop) of city $c$, the log of the income per capita (LogIncPerCap), the log of the median home price (LogMedHome) and the unemployment rate (UnempRate). The estimated values of the coefficients in the correction functions $\Psi_0$ and $\Psi_1$, the constant and the standard deviation of the normal error in the Tobit regressions are not reported for brevity. Panel B presents the average marginal effects of SportsAd and LogDist on $w_{i,c,j}$ in basis points and as percentage of the mean. The sample period is from September 1992 until August 1996. The universe of stocks is comprised by the publicly traded Primary Sports Sponsors and all the stocks that were ever included in the Russell 1000 index during the sample period. Households reside in 71 MSAs which were in the market for a sports team.

Panel A: Coefficient Estimates of Portfolio Weight

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| SportsAd | 0.345 | 0.316 | 0.346 | 0.317 | 0.249 | 0.238 | 0.262 | 0.255 |
| | [5.3] | [4.70] | [5.3] | [4.53] | [3.95] | [3.97] | [4.08] | [3.82] |
| LogDist | -0.127 | -0.127 | -0.124 | -0.129 | -0.138 | -0.138 | -0.131 | -0.134 |
| | [-5.75] | [-5.87] | [-5.75] | [-5.92] | [-8.16] | [-8.27] | [-7.19] | [-7.5] |
| LogIncome | | | 0.022 | 0.022 | 0.028 | 0.028 | 0.028 | 0.028 |
| | | | [3.55] | [3.54] | [4.92] | [4.91] | [5.14] | [5.14] |
| LogAge | | | 0.164 | 0.164 | 0.192 | 0.193 | 0.189 | 0.189 |
| | | | [9.22] | [9.25] | [12.15] | [12.22] | [12.21] | [12.21] |
| LogFamSize | | | -0.01 | -0.01 | -0.007 | -0.007 | -0.005 | -0.005 |
| | | | [-0.97] | [-0.97] | [-0.74] | [-0.76] | [-0.58] | [-0.59] |
| Male | | | 0.046 | 0.046 | 0.035 | 0.035 | 0.035 | 0.035 |
| | | | [3.52] | [3.54] | [3.52] | [3.5] | [3.53] | [3.54] |
| Educ | | | 0.037 | 0.037 | 0.12 | 0.123 | 0.154 | 0.154 |
| | | | [0.65] | [0.65] | [3.66] | [3.72] | [4.77] | [4.79] |
| Black | | | 0.028 | 0.028 | 0.012 | 0.011 | 0.04 | 0.04 |
| | | | [0.49] | [0.49] | [0.23] | [0.22] | [1.03] | [1.03] |
| Hispanic | | | -0.111 | -0.112 | 0.11 | 0.116 | 0.103 | 0.104 |
| | | | [-0.92] | [-0.92] | [1.51] | [1.61] | [1.54] | [1.58] |
| AsianOther | | | 0.042 | 0.04 | 0.035 | 0.041 | 0.026 | 0.027 |
| | | | [0.27] | [0.26] | [0.5] | [0.54] | [0.41] | [0.43] |
| ProfProxim | | | 0.453 | 0.45 | 0.188 | 0.18 | 0.184 | 0.181 |
| | | | [1.66] | [1.69] | [3.26] | [3.13] | [2.74] | [2.67] |
| LogSize | | | | | 0.108 | 0.108 | 0.112 | 0.111 |
| | | | | | [6.99] | [7.36] | [7.45] | [7.65] |

Table 6 Cont'd: Tobit Estimation of Household Portfolio Choice, With Correction for SportsAd Endogeneity

| Panel A: Coefficient Estimates of Portfolio Weight | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| Book/Market | | | | | 0.000 | 0.000 | 0.000 | 0.000 |
| | | | | | [0.91] | [0.68] | [0.72] | [0.54] |
| Turnover | | | | | 0.396 | 0.396 | 0.393 | 0.392 |
| | | | | | [11.57] | [11.76] | [10.99] | [11.24] |
| Momentum | | | | | -0.133 | -0.133 | -0.129 | -0.129 |
| | | | | | [-10.54] | [-10.67] | [-10.1] | [-10.25] |
| Volatility | | | | | 3.107 | 3.098 | 3.093 | 3.087 |
| | | | | | [25.39] | [25.18] | [24.92] | [24.75] |
| Profitability | | | | | 0.017 | 0.019 | 0.016 | 0.018 |
| | | | | | [0.79] | [0.88] | [0.75] | [0.84] |
| Investment | | | | | -0.041 | -0.041 | -0.041 | -0.041 |
| | | | | | [-4.48] | [-4.51] | [-4.45] | [-4.48] |
| LogSales | | | | | 0.026 | 0.026 | 0.026 | 0.026 |
| | | | | | [3.16] | [3.19] | [3.13] | [3.18] |
| LogSize × LogInduAD | | | | | 0.024 | 0.024 | 0.022 | 0.023 |
| | | | | | [19.55] | [18.57] | [15.45] | [16.24] |
| LogPop | | | | | | | -0.044 | -0.039 |
| | | | | | | | [-2.57] | [-2.37] |
| LogIncPerCap | | | | | | | -0.299 | -0.307 |
| | | | | | | | [-2.65] | [-2.71] |
| LogMedHome | | | | | | | 0.08 | 0.085 |
| | | | | | | | [2.02] | [2.12] |
| Unemp | | | | | | | 0.006 | 0.005 |
| | | | | | | | [0.75] | [0.66] |
| Sportsteam | | | | | | | 0.041 | 0.057 |
| | | | | | | | [1.91] | [2.21] |
| Industry FE | NO | NO | NO | NO | YES | YES | YES | YES |
| $\Psi^{1st}$ | YES | YES | YES | YES | YES | YES | YES | YES |
| $\Psi^{2nd}$ | YES | YES | YES | YES | YES | YES | YES | YES |
| $\Psi^{3rd}$ | NO | YES | NO | YES | NO | YES | NO | YES |
| Av. Households | 9,462 | 9,462 | 9,462 | 9,462 | 9,462 | 9,462 | 9,462 | 9,462 |
| Av. Stocks | 1,256 | 1,256 | 1,256 | 1,256 | 1,256 | 1,256 | 1,256 | 1,256 |

| Panel B: Average Marginal Effects on Portfolio Weight in Basis Points and as Percentage of the Mean | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| SportsAd | 9.35 | 6.48 | 9.31 | 6.41 | 3.7 | 3.42 | 3.98 | 3.73 |
| | 117.3% | 81.3% | 116.8% | 80.4% | 46.4% | 42.9% | 49.9% | 46.8% |
| LogDist | -2.37 | -2.35 | -2.31 | -2.39 | -1.41 | -1.42 | -1.35 | -1.37 |
| | -29.7% | -29.5% | -28.9% | -29.9% | -17.7% | -17.8% | -16.9% | -17.2% |

Table 7: Tobit Estimation of Household Portfolio Buys and Sells, Without and With Correction for SportsAd Endogeneity

This table presents the estimation results from four Tobit models of household portfolio trades. The estimation is performed in a panel of households and stocks for every month separately. Panel A presents the averages of the monthly coefficient estimates and the average $t$-statistics [shown in brackets] based on standard errors clustered at the household and city level. Columns 1 and 2 refer to household $i$'s buys in stock $j$ relative to the portfolio value and the estimation is performed for all stocks in the investment universe. Columns 3 and 4 refer to household $i$'s sells in stock $j$ relative to the portfolio value and the estimation is performed for the stocks that household $i$ holds at the end of the previous month. The key explanatory variables are SportsAd, i.e. an indicator variable equal to 1 if stock $j$ sponsors a sports team in city $c$ (where household $i$ resides) and LogDist, i.e. the log of the distance between household $i$'s ZIP Code and the ZIP Code of stock $j$'s headquarters. Columns 1 and 3 do not correct for SportsAd endogeneity. Columns 2 and 4 correct for SportsAd endogeneity via the control function method. The correction functions $\Psi_0$ and $\Psi_1$ are approximated quadratically. Other variables include controls for household demographics, stock characteristics, and MSA demographics. The household demographic controls refer to household $i$ and include: the log of the household's income (LogIncome), the log of the age (LogAge) of the household's head, the log of the family size (LogFamSize) of the household and an indicator variable equal to one if the household has a male head (Male). They also contain the percentage of the household's ZIP Code population that holds a bachelor's or higher degree (Educ), the percentages of the household's ZIP Code population that are Black (Black), Hispanic (Hispanic) or Asian or other race (AsianOther) (with the base group being the percentage of the population that is White) and the professional industrial proximity to stock $j$ of the household's ZIP Code population (ProfProxim). The stock characteristics refer to stock $j$ and consist of: the log of market capitalization (LogSize), the book-to-market ratio (Book/Market), the monthly turnover ratio (Turnover), the past annual return (Momentum), the standard deviation of monthly returns in the past year (Volatility), the ratio of past annual gross profits to assets (Profitability), the past annual growth rate of assets (Investment), the log of past annual sales (LogSales) and the interaction of the log of market capitalization (LogSize) with the log of the total advertisement expenses in the industry of the stock (LogInduAD). They also include industry indicator variables based on the assignment of stock $j$ in one of the 17 Fama-French industry portfolios. Controls for MSA demographics refer to city $c$ (where household $i$ resides) and include: the log of the population number (LogPop) of city $c$, the log of the income per capita (LogIncPerCap), the log of the median home price (LogMedHome) and the unemployment rate (UnempRate). The estimated values of the coefficients in the correction functions $\Psi_0$ and $\Psi_1$, the constant and the standard deviation of the normal error in the Tobit regressions are not reported for brevity. Panel B presents the average marginal effects of SportsAd and LogDist on $buy_{i,c,j}$ and $sell_{i,c,j}$ in basis points and as percentage of the mean. The sample period is from September 1992 until August 1996. The universe of stocks is comprised by the publicly traded Primary Sports Sponsors and all the stocks that were ever included in the Russell 1000 index during the sample period. Households reside in 71 MSAs which were in the market for a sports team.

| | Panel A: Coefficient Estimates | | | |
|---|---|---|---|---|
| | Buys | | Sells | |
| | (1) | (2) | (3) | (4) |
| SportsAd | 0.091 | 0.084 | -0.026 | -0.053 |
| | [4.63] | [3.20] | [-0.84] | [-0.44] |
| LogDist | -0.053 | -0.056 | 0.006 | 0.004 |
| | [-5.38] | [-5.91] | [0.98] | [0.33] |
| LogIncome | 0.016 | 0.016 | -0.013 | -0.013 |
| | [2.03] | [2.02] | [-0.65] | [-0.65] |
| LogAge | 0.060 | 0.059 | -0.031 | -0.031 |
| | [2.87] | [2.86] | [-0.62] | [-0.61] |
| LogFamSize | 0.001 | 0.001 | 0.000 | -0.000 |
| | [0.05] | [0.07] | [0.03] | [0.02] |
| Male | 0.039 | 0.039 | 0.057 | 0.057 |
| | [2.25] | [2.22] | [1.37] | [1.37] |
| Educ | 0.078 | 0.076 | 0.032 | 0.029 |
| | [1.90] | [1.84] | [0.43] | [0.38] |
| Black | -0.007 | -0.008 | -0.076 | -0.077 |
| | [-0.02] | [-0.03] | [-0.63] | [-0.64] |
| Hispanic | 0.04 | 0.037 | 0.016 | 0.013 |
| | [0.55] | [0.51] | [0.09] | [0.06] |
| AsianOther | 0.088 | 0.081 | 0.221 | 0.216 |
| | [1.27] | [1.17] | [1.81] | [1.76] |
| ProfProxim | 0.125 | 0.110 | 0.115 | 0.096 |
| | [1.55] | [1.38] | [0.82] | [0.69] |
| LogSize | 0.077 | 0.069 | 0.008 | 0.001 |
| | [4.00] | [3.66] | [0.19] | [0.06] |

Table 7 Cont'd: Tobit Estimation of Household Portfolio Choice, With Correction for SportsAd Endogeneity

| | Panel A: Coefficient Estimates Cont'd | | | |
|---|---|---|---|---|
| | Buys | | Sells | |
| | (1) | (2) | (3) | (4) |
| Book/Market | -0.009 | -0.008 | -0.006 | -0.006 |
| | [-0.87] | [-0.75] | [-0.51] | [-0.46] |
| Turnover | 0.304 | 0.293 | 0.254 | 0.251 |
| | [10.19] | [9.47] | [2.99] | [2.95] |
| Momentum | -0.058 | -0.054 | 0.023 | 0.021 |
| | [-3.78] | [-3.5] | [1.1] | [1.00] |
| Volatility | 1.110 | 1.094 | 0.748 | 0.757 |
| | [9.04] | [9.1] | [2.72] | [2.77] |
| Profitability | 0.035 | 0.034 | 0.080 | 0.079 |
| | [2.05] | [2.06] | [1.66] | [1.64] |
| Investment | -0.001 | 0.000 | 0.015 | 0.015 |
| | [0.29] | [0.44] | [0.98] | [0.98] |
| LogSales | -0.018 | -0.015 | -0.012 | -0.011 |
| | [-3.25] | [-2.82] | [-1.01] | [-0.95] |
| LogSize × LogInduAD | 0.010 | 0.011 | -0.002 | -0.000 |
| | [4.45] | [4.77] | [-0.42] | [-0.09] |
| LogPop | -0.015 | -0.010 | 0.011 | 0.023 |
| | [-1.39] | [-0.72] | [0.54] | [1.01] |
| LogIncPerCap | -0.126 | -0.121 | 0.054 | 0.042 |
| | [-1.29] | [-1.24] | [0.33] | [0.25] |
| LogMedHome | 0.014 | 0.012 | -0.042 | -0.034 |
| | [0.48] | [0.43] | [-0.76] | [-0.62] |
| UnempRate | 0.002 | 0.003 | -0.000 | -0.002 |
| | [0.39] | [0.49] | [-0.04] | [-0.17] |
| Sportsteam | 0.022 | 0.011 | -0.029 | -0.022 |
| | [0.95] | [0.47] | [-0.71] | [-0.5] |
| Industry FE | YES | YES | YES | YES |
| $\Psi^{1st}$ | YES | YES | YES | YES |
| $\Psi^{2nd}$ | YES | YES | YES | YES |
| Av. Households | 9,462 | 9,462 | 9,462 | 9,462 |
| Av. Stocks | 1,256 | 1,256 | 1,256 | 1,256 |

| Panel B: Average Marginal Effects in Basis Points and as Percentage of the Mean | | | | |
|---|---|---|---|---|
| | Buys | | Sells | |
| | (1) | (2) | (3) | (4) |
| SportsAd | 0.10 | 0.06 | -6.82 | -9.80 |
| | 47.2% | 28.3% | -8.4% | -12.1% |
| LogDist | -0.02 | -0.03 | 1.69 | 1.01 |
| | -9.4% | -14.2% | 2.1% | 1.3% |

Table 8: Household Returns of Primary Sports Sponsors vs. Other Russell 1000 Firms

This table presents the results from the returns test of publicly traded Primary Sports Sponsors vs. the other firms in Russell 1000 *conditional on household investment*. Returns are collected on a monthly basis and measured in percentage points (i.e. pps). $t$-statistics computed using Newey-West standard errors with lag order 3 are shown [in brackets]. The four Fama-French factors are used. Individual household returns are weighted by the respective total value of household holdings. Column 1 refers to the whole sample period, which is from October 1992 until September 1996. The month of October 1994 is used to break the sample into two equal subsamples. Columns 2 refers to Subsample 1. Column 3 refers to Subsample 2. Households reside in 71 MSAs which were in the market for a sports team.

| | (1) Whole Sample | (2) Subsample 1 | (3) Subsample 2 |
|---|---|---|---|
| | Panel A: Raw Returns | | |
| Mean | 0.046 | -0.306 | 0.398 |
| | [0.17] | [-0.91] | [1.03] |
| | Panel B: Return Regressions | | |
| Mktrf | -0.040 | 0.032 | -0.123 |
| | [-0.54] | [0.24] | [-1.55] |
| SMB | -0.240 | -0.025 | -0.150 |
| | [-3.49] | [-0.14] | [-1.54] |
| HML | 0.327 | 0.458 | 0.473 |
| | [4.50] | [2.66] | [2.91] |
| Mom | -0.064 | -0.194 | 0.070 |
| | [-0.53] | [-0.83] | [0.55] |
| Constant | 0.082 | -0.414 | 0.493 |
| | [0.30] | [-1.38] | [1.04] |

Table 9: Unconditional Returns of Primary Sports Sponsors vs. Other Russell 1000 Firms

This table presents the results from the unconditional returns test of the publicly traded Primary Sports Sponsors vs. the other stocks in Russell 1000. Returns are collected on a monthly basis and measured in percentage points (i.e. pps). $t$-statistics computed using Newey-West standard errors with lag order 3 are shown [in brackets]. The four Fama-French factors are used. Column 1 refers to the whole sample period, which is from October 1992 until September 1996. The month of October 1994 is used to break the sample into two equal subsamples. Column 2 refers to Subsample 1. Column 3 refers to Subsample 2.

| | (1)<br>Whole Sample | (2)<br>Subsample 1 | (3)<br>Subsample 2 |
|---|---|---|---|
| | Panel A: Raw Returns | | |
| Mean | -0.094 | -0.267 | 0.079 |
| | [-0.55] | [-1.05] | [0.34] |
| | Panel B: Returns Regressions | | |
| Mktrf | -0.047 | 0.004 | -0.091 |
| | [-1.08] | [0.04] | [-1.36] |
| SMB | -0.259 | -0.128 | -0.227 |
| | [-3.46] | [-0.94] | [-2.00] |
| HML | 0.112 | 0.307 | 0.033 |
| | [1.69] | [3.05] | [0.29] |
| Mom | -0.009 | -0.170 | 0.082 |
| | [-0.13] | [-1.49] | [0.74] |
| Constant | -0.035 | -0.221 | 0.076 |
| | [-0.22] | [-1.28] | [0.27] |

Table 10: Description of the Non-Directly-Recognizable Publicly Traded Primary Sports Sponsors

This table describes the distribution of the non-directly recognizable publicly traded Primary Sports Sponsors over time. In every sports season, the publicly traded sports sponsors are identified from merging the Primary Sports Sponsors listed in the Sports Sponsor FactBook of Team Marketing Report (issued in 1993, 1994, 1995 and 1996) with the history files of CRSP. Non-directly recognizable sponsors are sponsors which did not displayed their company name or logo in their product advertisement. (For a description of the Directly-Recognizable Publicly Traded Primary Sports Sponsors see Table 2.) Row 1 refers to their total number. Row 2 refers to their membership in Russell 1000. Row 3 refers to whether their securities are American depository receipts (ADR's). Rows 4-14 refer to their industrial classification based on their assignment in one of the 17 Fama-French industry portfolios. (The number of the respective industry portfolio is shown in parenthesis.) Food stands for food. Clths stands for textiles, apparel and footware. Durbl stands for consumer durables. Chems stands for chemicals. Cnsum stands for drugs, soap, perfumes and tobacco. Machn stands for machinery and business equipment. Cars stands for automobiles. Trans stands for transportation. Finan stands for banks, insurance companies, and other financials. OthSvc stands for other and services. Due to lack of participation, the industry portfolios of Mines (2, i.e. mining and minerals), Cnstr (8, i.e. construction and construction materials), Steel (9, i.e. steel works etc.), FabPr (10, i.e. fabricated products), Rtail (13, i.e. retail stores) and Utils (14, i.e. utilities) are not being displayed. Row 15 refers to the average number of Metropolitan Statistical Areas (MSA's) in which a publicly traded sponsor advertises and Row 16 refers to the median.

| | Sports Season | | | |
|---|---|---|---|---|
| | 1992-1993 | 1993-1994 | 1994-1995 | 1995-1996 |
| Num. of Firms | 33 | 46 | 47 | 44 |
| Russell 1000 | 22 | 29 | 30 | 26 |
| ADRs | 3 | 8 | 7 | 7 |
| Food (1) | 7 | 11 | 11 | 10 |
| Oil (3) | 1 | 2 | 2 | 2 |
| Clths (4) | 3 | 3 | 2 | 1 |
| Durbl (5) | 4 | 4 | 3 | 3 |
| Chems (6) | 1 | 3 | 3 | 1 |
| Cnsum (7) | 4 | 7 | 9 | 10 |
| Machn (11) | 1 | 1 | 1 | 1 |
| Cars (12) | 1 | 2 | 2 | 2 |
| Rtail (15) | 6 | 7 | 6 | 6 |
| Finan (16) | 0 | 1 | 1 | 2 |
| OthSvc (17) | 5 | 5 | 7 | 6 |
| Av. MSAs | 4.03 | 4.8 | 4.34 | 4.61 |
| Med. MSAs | 3 | 3 | 2 | 3 |

Table 11: Tobit Estimation of Household Portfolio Choice, Directly & Non-Directly Recognizable SportsAd

This table presents the estimation results from four Tobit models of household portfolio choice in the presence of directly and non-directly firm recognizable Sports Advertising (SportsAdDnD). The estimation is performed in a panel of households and stocks for every month separately. Panel A presents the averages of the monthly coefficient estimates and the average $t$-statistics [shown in brackets] based on standard errors clustered at the household and city level. The dependent variable is $w_{i,c,j}$, the portfolio weight of household $i$ residing in city $c$ on stock $j$. The key explanatory variables are SportsAd, i.e. an indicator variable equal to 1 if stock $j$ sponsors a sports team in city $c$ (where household $i$ resides) and is directly recognizable by displaying the company name or logo in the product advertisement, SportsAdDnD, i.e. an indicator variable equal to 1 if a stock sponsors a sports team in the city of a household's residence without conditioning on direct recognizability and LogDist, i.e. the log of the distance between household $i$'s ZIP Code and the ZIP Code of stock $j$'s headquarters. Columns 1 and 3 do not correct for the endogeneity of SportsAd and SportsAdDnD. Columns 2 and 4 correct for the endogeneity of SportsAd and SportsAdDnD using a control function method. The correction functions $\Psi_0$ and $\Psi_1$ are approximated quadratically. Other variables include controls for household demographics, stock characteristics, and MSA demographics. The household demographic controls refer to household $i$ and include: the log of the household's income (LogIncome), the log of the age (LogAge) of the household's head, the log of the family size (LogFamSize) of the household and an indicator variable equal to one if the household has a male head (Male). They also contain the percentage of the household's ZIP Code population that holds a bachelor's or higher degree (Educ), the percentages of the household's ZIP Code population that are Black (Black), Hispanic (Hispanic) or Asian or other race (AsianOther) (with the base group being the percentage of the population that is White) and the professional industrial proximity to stock $j$ of the household's ZIP Code population (ProfProxim). The stock characteristics refer to stock $j$ and consist of: the log of market capitalization (LogSize), the book-to-market ratio (Book/Market), the monthly turnover ratio (Turnover), the past annual return (Momentum), the standard deviation of monthly returns in the past year (Volatility), the ratio of past annual gross profits to assets (Profitability), the past annual growth rate of assets (Investment), the log of past annual sales (LogSales) and the interaction of the log of market capitalization (LogSize) with the log of the total advertisement expenses in the industry of the stock (LogInduAD). They also include industry indicator variables based on the assignment of stock $j$ in one of the 17 Fama-French industry portfolios. Controls for MSA demographics refer to city $c$ (where household $i$ resides) and include: the log of the population number (LogPop) of city $c$, the log of the income per capita (LogIncPerCap), the log of the median home price (LogMedHome) and the unemployment rate (UnempRate). The estimated values of the coefficients in the correction functions $\Psi_0$ and $\Psi_1$, the constant and the standard deviation of the normal error in the Tobit regressions are not reported for brevity. Panel B presents the average marginal effects of SportsAd, SportsAdDnD and LogDist on $w_{i,c,j}$ in basis points and as percentage of the mean. The sample period is from September 1992 until August 1996. The universe of stocks is comprised by the publicly traded Primary Sports Sponsors and all the stocks that were ever included in the Russell 1000 index during the sample period. Households reside in 71 MSAs which were in the market for a sports team.

| Panel A: Coefficient Estimates in Portfolio Weight | | | | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| SportsAd | | | 0.405 | 0.374 |
| | | | [7.05] | [6.31] |
| SportsAdDnD | 0.203 | 0.152 | -0.111 | -0.161 |
| | [5.00] | [2.87] | [-2.02] | [-2.45] |
| LogDist | -0.130 | -0.134 | -0.127 | -0.131 |
| | [-6.31] | [-7.20] | [-6.31] | [-7.18] |
| LogIncome | 0.028 | 0.028 | 0.028 | 0.028 |
| | [5.14] | [5.13] | [5.13] | [5.13] |
| LogAge | 0.188 | 0.189 | 0.189 | 0.189 |
| | [12.06] | [12.15] | [12.13] | [12.22] |
| LogFamSize | -0.006 | -0.005 | -0.006 | -0.005 |
| | [-0.6] | [-0.58] | [-0.6] | [-0.58] |
| Male | 0.036 | 0.035 | 0.036 | 0.035 |
| | [3.62] | [3.53] | [3.62] | [3.53] |
| Educ | 0.160 | 0.154 | 0.160 | 0.154 |
| | [5.01] | [4.70] | [5.07] | [4.77] |
| Black | 0.043 | 0.039 | 0.044 | 0.040 |
| | [1.15] | [1.01] | [1.18] | [1.03] |
| Hispanic | 0.105 | 0.104 | 0.104 | 0.103 |
| | [1.52] | [1.52] | [1.56] | [1.56] |
| AsianOther | 0.043 | 0.031 | 0.038 | 0.026 |
| | [0.67] | [0.47] | [0.60] | [0.41] |

Table 11 Cont'd: Tobit Estimation of Household Portfolio Choice, Directly & Non-Directly Recognizable SportsAd

| Panel A Cont'd: Coefficient Estimates in Portfolio Weight | | | | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| ProfFam | 0.209 | 0.185 | 0.208 | 0.184 |
| | [2.83] | [2.78] | [2.83] | [2.75] |
| LogSize | 0.125 | 0.118 | 0.118 | 0.111 |
| | [6.81] | [7.65] | [6.53] | [7.31] |
| Book/Market | 0.000 | 0.000 | 0.000 | 0.000 |
| | [0.94] | [1.10] | [0.56] | [0.75] |
| Turnover | 0.401 | 0.396 | 0.399 | 0.394 |
| | [11.26] | [10.62] | [11.49] | [10.97] |
| Momentum | -0.130 | -0.129 | -0.130 | -0.129 |
| | [-10.36] | [-10.09] | [-10.38] | [-10.12] |
| Volatility | 3.046 | 3.075 | 3.095 | 3.121 |
| | [25.07] | [24.05] | [25.41] | [24.70] |
| Profitability | 0.010 | 0.008 | 0.016 | 0.015 |
| | [0.46] | [0.36] | [0.76] | [0.68] |
| Investment | -0.041 | -0.041 | -0.041 | -0.041 |
| | [-4.50] | [-4.56] | [-4.38] | [-4.44] |
| LogSales | 0.024 | 0.025 | 0.027 | 0.028 |
| | [2.59] | [2.78] | [3.10] | [3.34] |
| LogSize × LogInduAD | 0.021 | 0.022 | 0.021 | 0.022 |
| | [12.04] | [15.50] | [12.14] | [15.68] |
| LogPop | -0.048 | -0.045 | -0.048 | -0.045 |
| | [-3.66] | [-2.54] | [-3.66] | [-2.54] |
| LogIncPerCap | -0.335 | -0.312 | -0.335 | -0.312 |
| | [-2.76] | [-2.69] | [-2.76] | [-2.69] |
| LogMedHome | 0.093 | 0.087 | 0.093 | 0.087 |
| | [2.11] | [2.09] | [2.11] | [2.09] |
| UnempRate | 0.003 | 0.005 | 0.003 | 0.005 |
| | [0.45] | [0.70] | [0.45] | [0.70] |
| Sportsteam | 0.066 | 0.046 | 0.066 | 0.046 |
| | [3.59] | [2.10] | [3.59] | [2.10] |
| Industry FE | YES | YES | YES | YES |
| $\Psi^{1st}$ | NO | YES | NO | YES |
| $\Psi^{2nd}$ | NO | YES | NO | YES |
| Av. Households | 9,462 | 9,462 | 9,462 | 9,462 |
| Av. Stocks | 1,256 | 1,256 | 1,256 | 1,256 |

| Panel B: Average Marginal Effects on Portfolio Weight in Basis Points and as Percentage of the Mean | | | | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| SportsAd | | | 6.72 | 5.88 |
| | | | 84.3% | 73.8% |
| SportsAdDnD | 2.87 | 1.95 | -1.4 | -1.91 |
| | 36.0% | 24.5% | -17.6% | -24.0% |
| LogDist | -1.35 | -1.37 | -1.31 | -1.33 |
| | -16.9% | -17.2% | -16.4% | -16.7% |

Table 12: Tobit Estimation of Household Portfolio with Local Bias and Sports Sponsorship Interactions

This table presents the estimation results from four Tobit models of household portfolio choice with local bias and sports sponsorship interactions. The estimation is performed in a panel of households and stocks for every month separately. Panel A presents the averages of the monthly coefficient estimates and the average $t$-statistics [shown in brackets] based on standard errors clustered at the household and city level. The dependent variable is $w_{i,c,j}$, the portfolio weight of household $i$ residing in city $c$ on stock $j$. The key explanatory variables are (i) LocNAd, an indicator variable equal to one if stock $j$'s headquarters' ZIP Code is less than or equal to 250 miles (100 miles) away from household $i$'s address ZIP Code and stock $j$ does not sponsor a sports team in household $i$'s residence city, (ii) DistAd, an indicator variable equal to one if stock $j$'s headquarters' ZIP Code is more than 250 miles (100 miles) away from household $i$'s address ZIP Code and stock $j$ sponsors a sports team in household $i$'s residence city, and (iii) LocAd, an indicator variable equal to one if stock $j$'s headquarters' ZIP Code is less than or equal to 250 miles (100 miles) away from household $i$'s address ZIP Code and stock $j$ sponsors a sports team in household $i$'s residence city. Columns 1 and 2 define stock $j$'s locality based on the threshold of 250 miles, while Columns 3 and 4 based on the threshold of 100 miles. Columns 1 and 3 do not correct for SportsAd endogeneity, while Columns 2 and 4 correct for the endogeneity of SportsAd using a control function method. The correction functions $\Psi_0$ and $\Psi_1$ are approximated quadratically. Other variables include controls for household demographics, stock characteristics, and MSA demographics. The household demographic controls refer to household $i$ and include: the log of the household's income (LogIncome), the log of the age (LogAge) of the household's head, the log of the family size (LogFamSize) of the household and an indicator variable equal to one if the household has a male head (Male). They also contain the percentage of the household's ZIP Code population that holds a bachelor's or higher degree (Educ), the percentages of the household's ZIP Code population that are Black (Black), Hispanic (Hispanic) or Asian or other race (AsianOther) (with the base group being the percentage of the population that is White) and the professional industrial proximity to stock $j$ of the household's ZIP Code population (ProfProxim). The stock characteristics refer to stock $j$ and consist of: the log of market capitalization (LogSize), the book-to-market ratio (Book/Market), the monthly turnover ratio (Turnover), the past annual return (Momentum), the standard deviation of monthly returns in the past year (Volatility), the ratio of past annual gross profits to assets (Profitability), the past annual growth rate of assets (Investment), the log of past annual sales (LogSales) and the interaction of the log of market capitalization (LogSize) with the log of the total advertisement expenses in the industry of the stock (LogInduAD). They also include industry indicator variables based on the assignment of stock $j$ in one of the 17 Fama-French industry portfolios. Controls for MSA demographics refer to city $c$ (where household $i$ resides) and include: the log of the population number (LogPop) of city $c$, the log of the income per capita (LogIncPerCap), the log of the median home price (LogMedHome) and the unemployment rate (UnempRate). The estimated values of the coefficients in the correction functions $\Psi_0$ and $\Psi_1$, the constant and the standard deviation of the normal error in the Tobit regressions are not reported for brevity. Panel B presents the average marginal effects of LocNAd, DistAd and LocAd on $w_{i,c,j}$ in basis points and as percentage of the mean. The sample period is from September 1992 until August 1996. The universe of stocks is comprised by the publicly traded Primary Sports Sponsors and all the stocks that were ever included in the Russell 1000 index during the sample period. Households reside in 71 MSAs which were in the market for a sports team.

| | Panel A: Coefficient Estimates in Portfolio Weight | | | |
|---|---|---|---|---|
| | 250-mile Radius | | 100-mile Radius | |
| | (1) | (2) | (3) | (4) |
| LocNAd | 0.268 | 0.206 | 0.468 | 0.373 |
| | [5.79] | [5.06] | [5.64] | [5.91] |
| DistAd | 0.340 | 0.296 | 0.322 | 0.284 |
| | [7.53] | [4.64] | [8.41] | [4.54] |
| LocAd | 0.767 | 0.705 | 0.846 | 0.790 |
| | [5.60] | [5.82] | [5.34] | [5.72] |
| LogIncome | 0.027 | 0.027 | 0.027 | 0.027 |
| | [4.99] | [4.98] | [5.01] | [5.00] |
| LogAge | 0.188 | 0.188 | 0.188 | 0.188 |
| | [12.09] | [12.12] | [12.10] | [12.17] |
| LogFamSize | -0.005 | -0.005 | -0.006 | -0.006 |
| | [-0.57] | [-0.60] | [-0.66] | [-0.64] |
| Male | 0.034 | 0.034 | 0.037 | 0.035 |
| | [3.48] | [3.44] | [3.73] | [3.58] |
| Educ | 0.176 | 0.181 | 0.178 | 0.178 |
| | [5.39] | [5.43] | [6.23] | [5.95] |
| Black | 0.068 | 0.066 | 0.088 | 0.077 |
| | [1.78] | [1.78] | [2.45] | [2.13] |
| Hispanic | 0.103 | 0.112 | 0.079 | 0.094 |
| | [2.04] | [2.22] | [1.65] | [2.00] |
| AsianOther | 0.035 | 0.048 | 0.016 | 0.026 |
| | [0.49] | [0.65] | [0.24] | [0.38] |
| ProfProx | 0.338 | 0.344 | 0.306 | 0.302 |
| | [3.26] | [3.41] | [3.41] | [3.34] |

Table 12 Cont'd: Tobit Estimation of Household Portfolio with Local Bias and Sports Sponsorship Interactions

| | Panel A: Coefficient Estimates in Portfolio Weight Cont'd | | | |
|---|---|---|---|---|
| | 250-mile Radius | | 100-mile Radius | |
| | (1) | (2) | (3) | (4) |
| LogSize | 0.125 | 0.134 | 0.118 | 0.122 |
| | [8.92] | [10.56] | [6.56] | [9.08] |
| Book/Market | 0.000 | 0.000 | 0.000 | 0.000 |
| | [0.65] | [0.26] | [0.43] | [0.43] |
| Turnover | 0.420 | 0.420 | 0.394 | 0.340 |
| | [13.26] | [13.26] | [12.54] | [12.22] |
| Momentum | -0.130 | -0.119 | -0.131 | -0.122 |
| | [-9.85] | [-8.94] | [-9.96] | [-9.10] |
| Volatility | 3.083 | 3.057 | 3.057 | 3.068 |
| | [25.34] | [24.26] | [23.08] | [22.02] |
| Profitability | 0.022 | 0.022 | 0.013 | 0.016 |
| | [0.82] | [0.83] | [0.58] | [0.71] |
| Investment | -0.042 | -0.040 | -0.041 | -0.041 |
| | [-4.40] | [-4.23] | [-4.31] | [-4.36] |
| LogSales | 0.023 | 0.022 | 0.025 | 0.024 |
| | [2.85] | [2.75] | [2.93] | [2.85] |
| LogSize × LogInduAD | 0.021 | 0.015 | 0.021 | 0.018 |
| | [13.90] | [7.40] | [11.11] | [10.38] |
| LogPop | -0.031 | -0.097 | -0.030 | -0.077 |
| | [-2.68] | [-4.24] | [-2.34] | [-3.86] |
| LogIncPerCap | -0.210 | -0.149 | -0.182 | -0.142 |
| | [-2.04] | [-1.39] | [-1.66] | [-1.41] |
| LogMedHome | 0.031 | -0.007 | -0.016 | -0.031 |
| | [0.81] | [-0.21] | [-0.53] | [-0.95] |
| UnempRate | -0.000 | 0.010 | -0.004 | 0.006 |
| | [0.02] | [1.19] | [-0.50] | [0.72] |
| Sportsteam | 0.039 | -0.023 | 0.029 | -0.025 |
| | [2.11] | [-1.01] | [1.62] | [-1.13] |
| Industry FE | YES | YES | YES | YES |
| $\Psi^{1st}$ | NO | YES | NO | YES |
| $\Psi^{2nd}$ | NO | YES | NO | YES |
| Av. Households | 9,462 | 9,462 | 9,462 | 9,462 |
| Av. Stocks | 1,256 | 1,256 | 1,256 | 1,256 |

| Panel B: Average Marginal Effects on Portfolio Weight in Basis Points and as Percentage of the Mean | | | | |
|---|---|---|---|---|
| | 250-mile Radius | | 100-mile Radius | |
| | (1) | (2) | (3) | (4) |
| LocNAd | 2.77 | 1.8 | 8.23 | 6.44 |
| | 34.8% | 22.6% | 103.3% | 80.8% |
| DistAd | 4.74 | 3.46 | 4.63 | 3.17 |
| | 59.5% | 43.4% | 58.1% | 39.8% |
| LocAd | 24.04 | 21.45 | 31.27 | 26.62 |
| | 301.6% | 269.1% | 392.4% | 334.0% |

Table 13: Regressions of Household Portfolio Weight Deviations from the Market with Local Bias and Sports Sponsorship Interactions

This table presents the estimation results from four linear regressions of household portfolio weight deviations from the market, with local bias and sports sponsorship interactions. The estimation is performed in a panel of households and stocks for every month separately. The table presents the averages of the monthly coefficient estimates in basis points (bps) and the average $t$-statistics [shown in brackets] based on standard errors clustered at the household and city level. The dependent variable is $w_{i,c,j} - w_j^{VW}$, the portfolio weight of household $i$ residing in city $c$ on stock $j$. The key explanatory variables are (i) LocNAd, an indicator variable equal to one if stock $j$'s headquarters' ZIP Code is less than or equal to 250 miles (100 miles) away from household $i$'s address ZIP Code and stock $j$ does not sponsor a sports team in household $i$'s residence city, (ii) DistAd, an indicator variable equal to one if stock $j$'s headquarters' ZIP Code is more than 250 miles (100 miles) away from household $i$'s address ZIP Code and stock $j$ sponsors a sports team in household $i$'s residence city, and (iii) LocAd, an indicator variable equal to one if stock $j$'s headquarters' ZIP Code is less than or equal to 250 miles (100 miles) away from household $i$'s address ZIP Code and stock $j$ sponsors a sports team in household $i$'s residence city. Columns 1 and 2 define stock $j$'s locality based on the threshold of 250 miles, while Columns 3 and 4 based on the threshold of 100 miles. Columns 1 and 3 do not correct for SportsAd endogeneity, while Columns 2 and 4 correct for the endogeneity of SportsAd using a control function method. The correction functions $\Psi_0$ and $\Psi_1$ are approximated quadratically. Other variables include controls for household demographics, stock characteristics, and MSA demographics. The household demographic controls refer to household $i$ and include: the log of the household's income (LogIncome), the log of the age (LogAge) of the household's head, the log of the family size (LogFamSize) of the household and an indicator variable equal to one if the household has a male head (Male). They also contain the percentage of the household's ZIP Code population that holds a bachelor's or higher degree (Educ), the percentages of the household's ZIP Code population that are Black (Black), Hispanic (Hispanic) or Asian or other race (AsianOther) (with the base group being the percentage of the population that is White) and the professional industrial proximity to stock $j$ of the household's ZIP Code population (ProfProxim). The stock characteristics refer to stock $j$ and consist of: the log of market capitalization (LogSize), the book-to-market ratio (Book/Market), the monthly turnover ratio (Turnover), the past annual return (Momentum), the standard deviation of monthly returns in the past year (Volatility), the ratio of past annual gross profits to assets (Profitability), the past annual growth rate of assets (Investment), the log of past annual sales (LogSales) and the interaction of the log of market capitalization (LogSize) with the log of the total advertisement expenses in the industry of the stock (LogInduAD). They also include industry indicator variables based on the assignment of stock $j$ in one of the 17 Fama-French industry portfolios. Controls for MSA demographics refer to city $c$ (where household $i$ resides) and include: the log of the population number (LogPop) of city $c$, the log of the income per capita (LogIncPerCap), the log of the median home price (LogMedHome) and the unemployment rate (UnempRate). The estimated values of the coefficients in the correction functions $\Psi_0$ and $\Psi_1$ and the constant in the linear regressions are not reported for brevity. The sample period is from September 1992 until August 1996. The universe of stocks is comprised by the publicly traded Primary Sports Sponsors and all the stocks that were ever included in the Russell 1000 index during the sample period. Households reside in 71 MSAs which were in the market for a sports team.

| | Deviations from VW Market Port. Weights (bps) | | | |
|---|---|---|---|---|
| | 250-mile Radius | | 100-mile Radius | |
| | (1) | (2) | (3) | (4) |
| LocNAd | 9.39 | 6.53 | 17.14 | 15.23 |
| | [4.55] | [4.20] | [3.62] | [3.69] |
| DistAd | 10.54 | 8.75 | 12.45 | 5.05 |
| | [2.56] | [2.10] | [3.36] | [2.26] |
| LocAd | 69.65 | 46.16 | 84.96 | 62.81 |
| | [2.46] | [2.72] | [2.2] | [2.49] |
| LogIncome | -0.01 | 0.00 | -0.01 | -0.01 |
| | [-0.50] | [0.04] | [-0.85] | [-0.42] |
| LogAge | 0.14 | 0.16 | 0.12 | 0.13 |
| | [1.54] | [1.38] | [1.57] | [1.49] |
| LogFamSize | -0.04 | -0.05 | -0.05 | -0.05 |
| | [-1.11] | [-1.20] | [-1.73] | [-1.57] |
| Male | -0.03 | -0.04 | 0.02 | 0.01 |
| | [-1.08] | [-0.93] | [1.01] | [0.35] |
| Educ | 1.10 | 1.36 | 1.09 | 1.22 |
| | [2.89] | [2.82] | [3.92] | [3.56] |
| Black | 0.32 | 0.27 | 0.74 | 0.60 |
| | [0.94] | [0.78] | [1.35] | [1.17] |
| Hispanic | 2.16 | 2.61 | 1.54 | 1.93 |
| | [1.48] | [1.49] | [1.29] | [1.48] |
| AsianOther | 1.37 | 2.11 | 0.96 | 1.45 |
| | [1.34] | [1.54] | [1.12] | [1.33] |

Table 13 Cont'd: Regressions of Household Portfolio Weight Deviations from the Market with Local Bias and Sports Sponsorship Interactions

| | Deviations from VW Market Port. Weights (bps) | | | |
|---|---|---|---|---|
| | 250-mile Radius | | 100-mile Radius | |
| | (1) | (2) | (3) | (4) |
| ProfProx | 14.06 | 14.53 | 13.83 | 13.79 |
| | [4.81] | [5.07] | [5.43] | [5.52] |
| LogSize | -5.40 | -4.71 | -5.46 | -5.10 |
| | [-14.40] | [-10.98] | [-11.51] | [-12.52] |
| Book/Market | 0.00 | 0.00 | 0.00 | 0.00 |
| | [-1.40] | [-1.04] | [-1.58] | [-0.88] |
| Turnover | 11.39 | 11.85 | 10.61 | 10.96 |
| | [8.21] | [8.66] | [8.92] | [9.26] |
| Momentum | -1.90 | -1.67 | -1.90 | -1.78 |
| | [-6.95] | [-6.64] | [-7.20] | [-7.13] |
| Volatility | 43.63 | 41.89 | 42.6 | 41.62 |
| | [9.64] | [8.52] | [9.08] | [8.34] |
| Profitability | 2.15 | 2.27 | 1.93 | 2.05 |
| | [2.14] | [2.22] | [2.05] | [2.11] |
| Investment | -1.00 | -0.93 | -0.99 | -0.93 |
| | [-5.60] | [-4.92] | [-5.62] | [-5.04] |
| LogSales | -0.65 | -0.68 | -0.67 | -0.66 |
| | [-3.52] | [-3.64] | [-3.23] | [-3.17] |
| LogSize × LogInduAD | 0.57 | 0.34 | 0.58 | 0.44 |
| | [12.13] | [4.10] | [10.77] | [6.91] |
| LogPop | -0.71 | -2.49 | -0.74 | -1.78 |
| | [-2.36] | [-3.21] | [-2.63] | [-2.90] |
| LogIncPerCap | -6.41 | -5.41 | -5.08 | -4.63 |
| | [-2.86] | [-2.08] | [-2.35] | [-1.94] |
| LogMedHome | 1.38 | 0.75 | 0.20 | -0.05 |
| | [1.52] | [0.73] | [0.30] | [-0.03] |
| UnempRate | -0.12 | 0.11 | -0.22 | -0.05 |
| | [-0.73] | [0.42] | [-1.55] | [-0.41] |
| Sportsteam | 1.09 | 0.68 | 0.89 | 0.64 |
| | [2.73] | [1.42] | [2.97] | [1.55] |
| Industry FE | YES | YES | YES | YES |
| $\Psi^{1st}$ | NO | YES | NO | YES |
| $\Psi^{2nd}$ | NO | YES | NO | YES |
| Av. Households | 9,462 | 9,462 | 9,462 | 9,462 |
| Av. Stocks | 1,256 | 1,256 | 1,256 | 1,256 |

Figure 1: Geographical Distribution of Households, Stocks and Sports Teams

This figure depicts the geographical coordinates of 18,421 households, 286 publicly traded Primary Sports Sponsors, 1,123 other public firms which were ever included in the Russell 1000 index during that period and 107 sports teams. The address ZIP-codes of the households, the stocks' headquarters and the teams' headquarters are converted to geographical coordinates based on the geographical relationship files provided by the US Census Bureau. The horizontal axis shows the longitude coordinates and the vertical axis shows the latitude coordinates. Blue circles indicate the address ZIP codes of the households. Green squares indicate the address ZIP codes of the headquarters of the publicly traded Primary Sports Sponsors. Red squares indicate the address ZIP codes of the headquarters of the other Russell 1000 firms. Yellow circles indicate the address ZIP codes of the sports teams. The sample period is from September 1992 until August 1996. The list of the publicly traded Primary Sports Sponsors is extracted in the Sports Sponsor FactBook of Team Marketing Report (issued in 1993, 1994, 1995 and 1996) and the Russell 1000. Households reside in 71 MSAs which were in the market for a sports team.