Advertising, Shareholder Base, and Firm Value*

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<Abstract>
We test Merton's investor recognition hypothesis (1987) using an approach that links advertising, shareholder base, and firm value. Specifically, we employ a two-stage regression approach where we obtain the residual shareholder base attributable to advertising in the first stage and then use these residuals as an input into the second-stage regression of firm value. Our sample covers stocks traded on the NYSE, AMEX, and Nasdaq and spans 37 years from 1975 to 2011. We find that advertising increases the shareholder base and this in turn increases firm value. However, not all firms enjoy the benefits of added investor recognition resulting from advertising. The positive valuation effect is observed only when firms are less visible in the market, proxied by a small investor base, being listed on Nasdaq, and a young firm age. Finally, we find that the linkage between advertising and firm value via shareholder base has weakened gradually over the last three decades. We conjecture that recent developments in the media industry and information technology have contributed to this phenomenon.

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Merton (1987) hypothesizes that when investors have incomplete information, their stock selection is limited to the set of stocks with which they are familiar. The resulting suboptimal diversification leads to a higher risk premium than would be warranted given complete information. Consequently, a firm's expected return decreases and its value increases in the degree of investors' awareness of the firm. Studies that empirically examine the predictions of Merton's hypothesis traditionally focus on corporate or institutional events that could change the visibility of a stock. Such examples are exchange listings (Kadlec and McConnell, 1994), international listings (Foerster and Karoly, 1999), index additions or deletions (Chen, Noronha, and Singal, 2004), and minimum trade unit changes (Amihud, Mandelson and Uno, 1999, and Ahn, Cai, Melvin, and Hamao, 2014). While these events undoubtedly accompany changes in firm visibility, they are also associated with signaling and/or liquidity effects that make it hard to distinguish the pure influence of increased or diminished firm visibility in the stock market.

Recently, a number of studies have examined the cross-sectional link between investor recognition and stock returns. There are two lines of research in this direction. The first uses the breadth of ownership as a proxy for investor recognition. Lehavy and Sloan (2008) and Richardson, Sloan, and You (2012) use the breadth of ownership as measured by the number of institutional shareholders and find that investor recognition is positively related to realized returns and negatively related to expected returns. Bodnaruk and Ostberg (2009) use detailed information about the composition of shareholders on the Swedish stock market and show that the size of the shareholder base negatively affects stock returns when controlling for firm size and idiosyncratic risk.

The second approach studies the role of product market advertising in enhancing firm visibility. Advertising is designed to draw people's attention to products and/or firms. To the extent that people have limited attention and that advertising is an effective way to make people aware of a firm or the product it sells, the increased awareness due to advertising will not only help improve product sales but also increase investor recognition. Grullon, Kanatas, and Weston (2004) use advertising expenditures as a proxy for firm visibility and show that firms with greater advertising expenditures have a larger number of shareholders and higher liquidity. Chemmanur and Yan (2011) propose that advertising expenditures affect the degree of investor recognition and that an increase in advertising expenditures results in higher contemporaneous stock returns and lower future stock returns.

In this study, we merge the above two threads of research by linking advertising, breadth of ownership, and firm value. More specifically, we investigate whether advertising affects a firm's shareholder base and whether the ensuing change in the shareholder base changes firm value. If advertising enhances a firm's visibility and prompts more investors to buy the firm's stock, its shareholder base should expand. This expanded shareholder base would then, in Merton's context, raise the value of the firm. The studies that examine the relation between advertising and firm value focus on the direct effect of the former on the latter without explicitly exploring the role of shareholder base in the linkage (Chemmanur and Yan, 2011). However, it should be noted that, in Merton's framework, the causality must run first from advertising to investor base and then from investor base to firm value. That is, investor base is a link that bridges advertising and firm value. We attempt to empirically verify this logical link. Grullon et al. (2004) study the link among advertising, shareholder base, and liquidity. We study how the extra shareholder base solely attributable to advertising affects firm value.

To investigate the causal link from advertising to investor recognition and then to firm value, we employ a two-stage regression approach. In the first stage, we estimate a pair of cross-sectional regressions of the number of shareholders, one with and the other without advertising expenditures (*AD*). The regression is estimated with a group of control variables to account for the effects of the factors other than advertising that would determine the size of a shareholder base. The reduction in the values of residuals between the two models (i.e., the residuals from the model without *AD* less the residuals from the model with *AD*) is then interpreted as the residual shareholder base solely attributable to advertising. This residual shareholder base is our key measure reflecting the extra amount of investor recognition generated by advertising. We then estimate a second-stage regression with Tobin's Q as the dependent variable and the residual shareholder base obtained from the first-stage regressions as the key explanatory variable. We also include a group of control variables that are reported in the literature to affect Tobin's Q. The control variables also include advertising expenditures and liquidity to guard against the possibility that any positive association between shareholder base and Tobin's Q attributable to advertising is falsely driven by sales increases due to advertising or any liquidity effects related to an increased shareholder base. The regression also includes firm size and idiosyncratic volatility since these variables, along with investor base, are suggested by Merton (1987) as influencing firm value. This Tobin's Q regression will provide a direct test for whether there is a link between advertising and firm value. Merton's story suggests that the coefficient of the residual shareholder base in the Tobin's Q regression will be positive and significant.

We test the above empirical predictions using the data from the New York Stock Exchange (NYSE), American Stock Exchange (AMEX), and Nasdaq during the past four decades. Our overall empirical results support Merton's hypothesis. Consistent with prior research, we find that advertising increases the shareholder base. Since we control for firm size, the positive effect of advertising on shareholder base is not likely a manifestation of the counter feedback effect of a large firm size leading to large investments in advertising. Second, the increase in the shareholder base attributable to increased advertising has a positive impact on firm value. However, the benefits of added investor recognition via advertising are not observed in all firms. We identify a positive valuation effect from greater investor awareness through advertising only for firms that are less visible in the market, proxied by a smaller investor base, Nasdaq listing, or a young age. Firms that are already well known to investors, represented by a large shareholder base, being traded on the NYSE, or an old age, do not gain at all or even suffer value reductions. Finally, we find evidence that the aforementioned positive effect for Nasdaq firms is stronger in the early part of the sample period, supporting the prediction that the role of advertising as a device to enhance investor recognition has dwindled with advances in the media industry and information technology. Developments in the media industry and information technology in recent years have facilitated wider and more in-depth coverage of firms, enabling investors to have better access to company information. Therefore, *ceteris paribus*, advertising has been less effective as a device to increase investors' awareness about a firm in more recent years than in previous years.

The rest of the paper is organized as follows. In the next section, we propose hypotheses to be tested based on predictions implied by Merton's theory on the relation between advertising and shareholder base and how this relation affects firm value. Section 3 describes the data and methodology. Section 4 presents empirical results and discusses their implications. Section 5 summarizes empirical results and concludes the paper.

2. Hypotheses

Our first hypothesis is about the effect of advertising on the shareholder base. According to Merton (1987), investors buy stocks in companies with which they are familiar. To the extent that a firm's advertising activities enhance investors' awareness of the firm, the increased awareness will manifest itself in increased equity ownership. The word 'advertise' originates from the *Latin* word *advertere*,

which means ‘turn toward’ or ‘attract attention’. While firms advertise to introduce their products or promote their brands, they also advertise to assure investors that their business is viable. Regardless of whether a specific advertisement by a firm targets consumers or investors, it serves to elicit awareness about the firm. Insofar as advertising enhances cognitive associations with a firm’s brand and its name, the increased brand/firm recognition will translate to investment decisions in stock markets. The positive link between brand recognition and equity market investment decisions is well supported by the findings of several studies. For example, Frieder and Subrahmanyam (2005) demonstrate both theoretically and empirically that brand recognition of a firm’s products leads to a propensity by investors to hold the firm’s stock. Huberman (2001) also shows that familiarity is an important concern for investors when they make their stock investment choices. Grullon et al. (2004), in particular, offer direct evidence that the breadth of equity ownership is positively associated with a firm’s advertising expenditures. Based on the findings given by the above studies and especially following the one in Grullon et al., we first confirm the following hypothesis.

Hypothesis 1 (H1): *The greater the advertising expenditures, the greater the size of a firm’s shareholder base*.

Our central hypothesis connects advertising, investor base, and firm value in Merton’s framework. According to Merton (1987), *ceteris paribus*, a firm’s shadow cost of incomplete information decreases with its investor base. Merton then shows that a larger investor base is associated with a lower expected return and greater firm value. If advertising expands a firm’s investor base as predicted by H1, then the enlarged shareholder base due to a firm’s advertising efforts will lead to an increase in firm value. Hence, we predict the following cross-sectional pattern.

Hypothesis 2 (H2): *The greater the incremental size of a shareholder base attributable to advertising, the greater the firm value*.

A couple of issues merit mentioning about the above two hypotheses. First, Chemmanur and Yan (2011) examine the effect of advertising on firm value. The study reports that advertising increases contemporaneous returns and decreases future returns. However, it does not explicitly explore the role of shareholder base as a link to connect the two variables. In H2, we explicitly consider the link by focusing on how the incremental portion of the shareholder base attributable to advertising affects firm value.

Second, a test of H2 is conditional upon the verification of H1 because H2 is developed on the basis that H1 holds. Furthermore, as mentioned earlier, our study merges two threads of previous studies that examine Merton's investor recognition hypothesis – one that investigates the role of product market advertisement as a vehicle to increase investor awareness and another that explores the cross-sectional link between breadth of ownership and stock returns. To validate Merton's theory in our empirical setting, both H1 and H2 must be accepted.

Our cross-sectional and longitudinal analyses also allow us to investigate some auxiliary predictions on the effects of advertising on shareholder base and firm value. Even if advertising generally benefits firms through increased investor awareness, the amount of the increase varies from firm to firm: some will benefit more than others. We are specifically interested in the extent to which a firm is already visible in the market: the marginal increase in firm visibility due to advertising will be smaller, the more a firm is already known. In order to test this prediction, we employ three different proxies to gauge the extent to which a firm is known to investors. The first proxy is the size of the shareholder base itself, a direct measure of the degree of investor recognition for a firm. The second proxy concerns where a firm's stock is listed. Nasdaq firms are generally less visible than their exchange-listed counterparts. Therefore, advertising will be more effective for Nasdaq firms in enhancing investor awareness. The third one is firm age. The longer a firm has been out in the market, the more likely it is to be recognized by investors. Accordingly, younger firms will benefit more from advertising. From these follow our three auxiliary hypotheses.

Hypothesis 2.1 (H2.1): *The effect of increased investor recognition due to advertising on firm value is greater for firms with a smaller shareholder base*.

Hypothesis 2.2 (H2.2): *The effect of increased investor recognition due to advertising on firm value is greater for firms whose stocks are listed on Nasdaq*.

Hypothesis 2.3 (H2.3): *The effect of increased investor recognition due to advertising on firm value is greater for younger firms.*

Developments in both the media industry and information technology in recent years have fundamentally changed how firm information is disseminated to investors. Nowadays, business news media and

investment websites release volumes of information on companies every moment, and their coverage is much wider and more in-depth than one or two decades ago. As a consequence, investors have much easier access to company information than ever before. The implication is that advertising is less effective as a device to enhance investor awareness in more recent years . From this, we have the following hypothesis.

Hypothesis 3 (H3): *The positive effect of advertising on firm value via increased awareness is weaker in recent periods than earlier periods.*

3. Sample and Methodology

3.1. Sample

We limit our analysis to the universe of stocks that are traded on the New York Stock Exchange (NYSE), American Stock Exchange (AMEX), or Nasdaq from 1975 to 2011. We obtain shareholder information and other accounting variables from the COMPUSTAT database. Since COMPUSTAT provides information on the number of shareholders for common stocks only (item 100), we limit our sample to common stocks whose shareholder information is available from COMPUSTAT. The database provides shareholder information for stocks listed on the NYSE and AMEX from 1975. For Nasdaq stocks, however, shareholder information is limited to only a small portion before 1982. Accordingly, our coverage of the NYSE/AMEX sample spans 37 years from 1975 to 2011 while the coverage of Nasdaq firms runs for 30 years from 1982 to 2011. Another important variable in our analysis is the proxy for firms' investments in advertising activities. We use advertising expenditures from the COMPUSTAT database (item 45). Firms have no obligation to report advertising expenditures in their financial statements. Accordingly, many firms in the COMPUSTAT database do not report advertising expenditures. We exclude these firms from our analysis. As a result, the number of firms covered in our analysis is significantly smaller than the entire population of firms covered by COMPUSTAT. However, a comparison of basic statistics between our sample firms and those left out of the sample reveals that the two groups are not significantly different in their characteristics.[1]

[1] For the sake of brevity, we do not report the comparative statistics for our sample firms and the rest of the firms not covered by our analysis. However, they are available upon request.

Daily and monthly stock prices and trading volume are from the Center for Research for Security Prices (CRSP) database. If any of the accounting information including advertising expenses from the COMPUSTAT database or the market information from the CRSP database is not available, the firm is excluded. This sampling procedure yields an initial sample of 34,690 firm-year observations spanning 37 years and 4,480 stocks. In terms of listing venues, out of the total 4,480 firms in the sample, 2,066 are listed on the NYSE (15,209 firm-year observations), 543 on the AMEX (3,390 firm-year observations), and 2,420 on Nasdaq (16,091 firm-year observations). In the remainder of this section, we will discuss how our measure of the incremental effects of advertising on shareholder base is constructed and how we relate the measure to firm value. We also define the variables that are used in our analysis.

3.2. Empirical Approach

Our analysis is carried out in two stages. In the first stage, we estimate two separate regressions of the number of shareholders, where the two models are identical in terms of the composition of independent variables, except that one includes advertising expenditures while the other does not.

$$NSH_{i,t} = \alpha_1 + \sum_k \gamma_1^k X_{i,t}^k + \sum_j \delta_1^j YEAR_{i,t}^k + \sum_l \theta_1^l IND_{i,t}^k + \varepsilon_{1,i,t}. \quad (1)$$

$$NSH_{i,t} = \alpha_2 + \beta AD_{i,t-1} + \sum_k^K \gamma_2^k X_{i,t}^k + \sum_j \delta_2^j YEAR_{i,t}^k + \sum_l \theta_2^l IND_{i,t}^k + \varepsilon_{2,i,t}. \quad (2)$$

In the above equations, $NSH_{i,t}$ is the natural logarithm of the number of shareholders of firm *i* in year *t*. It is our measure for shareholder base. $AD_{i,t-1}$ is the natural logarithm of the firm's advertising expenditures in year *t*-1. Note that AD_{t-1} is included in model (2) but not in model (1). We use lagged *AD* to avoid a possible feedback effect of the shareholder base concurrently influencing advertising expenditures. *X* is a vector of variables that are predicted to affect the shareholder base and includes the following variables[2]:

SIZE the natural logarithm of equity market capitalization at yearend

ROA return on equity, defined as earnings before interest and taxes before depreciation and amortization divided by the book value of total assets in year *t*

[2] The selection of the above variables is partly influenced by Grullon et al. (2004).

TO	turnover, defined as the natural logarithm of the annual average monthly share volume during the year divided by the total number of shares outstanding at yearend
IDIO	idiosyncratic return volatility, estimated as the root mean squared errors from a Fama-French three-factor model using prior 60 month returns[3]
PRICE	the natural logarithm of the average stock price during the year
AGE	the logarithm of the number of years a firm has existed in the COMPUSTAT data

Large firms are likely to have a large shareholder base. Hence, *SIZE* is predicted to have a positive coefficient. Highly profitable firms (e.g., a high *ROA*) will be more attractive to investors. Thus, *ROA* is also expected to have a positive relation with *NSH*. The prediction of turnover on shareholder base is less clear. A high turnover may be interpreted as a sign of the presence of active informed trading. In this case, since liquidity traders are likely to shun stocks with active informed trading, a negative relation is predicted between *TO* and *NSH*. On the contrary, high turnover might simply indicate liquidity (Chordia, Subrahmanyam, and Anshuman, 2001), which then implies a positive relation between *TO* and *NSH*. A large idiosyncratic risk suggests more private information flow and less transparency, which could lead to less interest of the general investing public in the stock. Price might also be an important factor to consider for investors when they make an investment decision. A high price could make it difficult for investors who trade with small capital to buy the stock, suggesting that high price stocks have a smaller investor base. Age is predicted to have a positive link to shareholder base since older firms are likely to be better known to investors. We also include dummy variables to account for the 37 years during our sample period. Also, we add dummy variables for 48 industry specifications following Fama and French (1997). The significance of test results may be inflated if standard errors are correlated with groups. To address the possible presence of error clustering for years and industry dummies, we use robust standard errors adjusted for error clustering on both dummy variables (Peterson, 2009).

Regression models (1) and (2) serve two purposes. First, model (2) offers a direct test of H1. If advertising activities increase a firm's shareholder base, *AD* will bear a positive and significant sign. Second, the two models produce our proxy for the net effect of advertising on shareholder base, our key independent variable that will be used in the second-stage regression for firm value. The following are the details of how the proxy is constructed and the logic behind it. Recall that regression models (1) and (2)

[3] The Fama-French factors are obtained from Prof. Kenneth French's website (http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html).

are identical except for the presence of AD_{t-1} among the independent variables in equation (2). Since model (2) has an extra explanatory variable (i.e., AD_{t-1}), the difference in the residuals between models (1) and (2) can be interpreted as the marginal portion of the shareholder base of firm *i* explained by its advertising expenditures. Following this reasoning, we construct a variable that we believe captures the net portion of a firm's shareholder base attributable to advertising (*RESDIF*).

$$RESDIF_{i,t} = |\varepsilon_{1i,t}| - |\varepsilon_{2i,t}|. \tag{3}$$

A positive *RESDIF* would indicate that the addition of AD_{t-1} in model (2) reduces residuals from model (1). However, the variable could be noisy because it is subject to estimation errors, and interpretations of differentials in residuals are vague in some cases, particularly when the signs of the two residuals are different. For example, although $|\varepsilon_{1i,t}| - |\varepsilon_{2i,t}|$ is positive, if $\varepsilon_{1i,t}$ is positive while $\varepsilon_{2i,t}$ is negative, it is not clear whether *NSH* is better explained with the addition of AD_{t-1}. However, the presence of both a positive and significant coefficient of AD_{t-1} in model (2), which means advertising increases shareholder base, and a significantly positive average *RESDIF* would support the case that *RESDIF* makes a reasonable proxy for the incremental positive effect of advertising on the number of shareholders. A preliminary look at the actual regression results of AD_{t-1} and *RESDIF* confirms that this is the case. The coefficient of AD_{t-1} in the shareholder regression and *RESDIF* are both positive and highly significant.

The case is less ambiguous when both $\varepsilon_{1i,t}$ and $\varepsilon_{2i,t}$ have the same sign and $\varepsilon_{1i,t}$ is greater than $\varepsilon_{2i,t}$. This can only arise when the inclusion of AD_{t-1} reduces the residual in the regression model. Accordingly, we construct the following more restrictive measure of the addition of shareholders due to advertising.

$$RESDIF^{+} = |\varepsilon_{1i,t}| - |\varepsilon_{2i,t}|, \qquad where\ (\varepsilon_{1i,t})(\varepsilon_{2i,t}) > 0\ \ and\ |\varepsilon_{1i,t}| - |\varepsilon_{2i,t}| > 0. \tag{4}$$

A positive $RESDIF^{+}$ will offer an unambiguous sign that model (2) has a better fit than model (1). We conduct our analysis using both *RESDIF* and *RESDIF*+, and both measures produce qualitatively similar results. In the ensuing section, we discuss results based on $RESDIF^{+}$ because it captures the residual shareholder base attributable to advertising in a much clearer fashion and interpretations are less ambiguous.

The second stage model regresses firm value on *RESDIF*$^+$ and a group of control variables. The dependent variable is firm value, measured by Tobin's Q, which is widely used as a proxy for firm value in the literature (e.g., Allayannis and Weston, 2001), Green and Jame, 2013, and Lang and Stulz, 1994). We define Tobin's Q as the sum of the market value of equity and the book value of debt divided by the book value of assets. The regression model takes the following form:

$$Q_{i,t} = \alpha + \beta RESDIF_{i,t}^{+} + \sum_k^K \gamma_k X_{i,t} + \sum_j \delta^j YEAR_{i,t}^k + \sum_l \theta^l IND_{i,t}^k + \varepsilon_{i,t}. \quad (5)$$

The control variables consist of a group of variables that are used in our shareholder base regression including *AD*, *ROA*, *TO*, *IDIO*, and the following new variables:

ASSETS	the natural logarithm of the book value of assets at yearend
SALES	the natural logarithm of sales revenues during the year
LEV	leverage calculated as the book value of long-term debt divided by the book value of total assets
AMIHUD	the Amihud measure (2002) defined as the absolute value of daily return divided by daily dollar volume

While our regression analysis is designed to verify how advertising affects firm value via the indirect channel of the shareholder base, advertising can also positively affect firm value by increasing sales. Hence, we include advertising expenditures and sales in our *Q*-ratio regression to control for this direct channel between advertising and firm value. Our selection of the other control variables is motivated by the prior literature in corporate finance that deals with Tobin's *Q* (Black, Jang, and Kim, 2006, Fang, Noe, and Tice, 2009, and Kim and Lu, 2011). *ASSETS* captures the effect of firm size on firm value. *ROA*, *TO*, and *LEV* are inserted, respectively, to control for the effects of profitability, liquidity, and leverage on firm value. The inclusion of idiosyncratic risk (*IDIO*) is based on Merton's (1987) assertion that idiosyncratic risk is an important determinant of firm value if investors are not fully diversified. *AMIHUD* is included to control for the effect of liquidity on firm value (Amihud and Mendelson, 1986). We also use the Roll's spread in place of *AMIHUD* to account for the liquidity effect.[4] However, since both liquidity metrics produce qualitatively the same results, we report only the results using *AMIHUD*.

[4] Specifically, we use the Roll's spread (1984) with the adjustment by Lesmond (2005), which is defined as the square root of the absolute value of the serial covariance of daily returns.

Finally, we include year and industry dummies. The standard errors are adjusted for error clustering for years and industries.

We use two approaches in our regression analysis based on model (5). First, we estimate a panel regression for the entire set of observations for 37 years from 1975 to 2011. We also carry out a Fama-Macbeth type analysis by running a cross-sectional regression of model (5) for each of the 37 years and then perform a *t*-test for the 37 coefficients estimated for each independent variable. One limitation of model (5) is that many of the variables could be determined endogenously. As a remedy for this potential endogeneity issue, the following variation of model (5) is employed in the analysis.

$$\Delta Q_{i,t} = \alpha + \beta \Delta RESDIF_{i,t}^{+} + \sum_{k1}^{K1} \gamma_k X_{i,t-1} + \sum_{k2}^{K2} \gamma_k \Delta X_{i,t} + \sum_j \delta^j YEAR_{i,t}^k + \sum_l \theta^l IND_{i,t}^k + \varepsilon_{i,t}, \qquad (6)$$

where $\Delta Q_{i,t}$ and $\Delta RESDIF_{i,t}^{+}$ are the first-differences of *Q* and *RESDIF*$^+$, respectively, from *t*-1 to *t*. *X*, the vector of state variables, includes *AD*, *ROA*, *ASSETS*, *LEV*, *TO*, *IDIO*, and *AMIHUD* (or *ROLL*), all measured in year *t*-1. ΔX includes the differenced values of *AD*, *ROA*, and *SALES* from *t*-1 to *t* (i.e., ΔAD, ΔROA, and $\Delta SALES$).

H2.1 predicts that the effect of increased investor awareness due to advertising on firm values is greater for firms with a small shareholder base whereas H2.2 predicts that the same effect is greater for firms that are listed on Nasdaq. Meanwhile, H2.3 proposes that younger firms experience greater benefits from increased awareness due to advertising. In order to test these hypotheses, we introduce interaction terms to our independent variables. Specifically, to test H2.1, we interact *RESDIF*$^+$ with a dummy variable that takes the value of one if the number of shareholders of a firm is below the median in the sample and zero otherwise (*RESDIF*$^+$×*SMALL_NSH*). Likewise, we introduce an interaction term between *RESDIF*$^+$ and a dummy variable that has the value of one if a stock is listed on Nasdaq and zero otherwise (*RESDIF*$^+$×*NASDAQ*). For H2.3, we utilize a dummy variable that takes the value of one if firm age is less than the median age for the entire sample and zero otherwise (*RESDIF*$^+$×*AGE*). For each of the hypotheses to be accepted, we should have a significant and positive coefficient from the relevant interaction term.

4. Empirical Results

4.1. Descriptive Statistics

Table 1 shows basic descriptive statistics (Panel A) and Spearman correlations (Panel B) for the variables used in the analysis. The mean (median) value of advertising expenditures, *AD*, is 15.33 (15.27), which is $4.5 million ($4.3 million) before taking logs. The mean (median) number of shareholders, *NSH*, is 7.65 (7.55) or 2,096 (1,906) before taking logs. The mean and median of both variables are close to each other, indicating that the log transformations are reasonable. The mean and median Q-ratios are 1.85 and 1.36, respectively.

The simple correlation analysis presented in Panel B of Table 1 offers a brief glimpse of the links among the variables. For brevity, we only report correlations between our main and control variables. The signs of the correlations are generally in line with our predictions. Shareholder base is positively related to advertising expenses, hinting that firms with greater advertising expenses attract more investors. It is also positively correlated with return on equity, age, and firm size and negatively related to price and idiosyncratic volatility. Further, it is negatively related to turnover, which suggests that investors avoid stocks with active informed trading. The Q-ratio is positively correlated with turnover and idiosyncratic risk and negatively related to the remaining variables, including shareholder base. While the simple correlation analysis presented in Table 1 offers some clues about the effects of some of the variables on shareholder base and firm value, it remains to be seen what the actual relations among the variables will be when the effects of other variables are accounted for in a regression framework.

4.2. The Effect of Advertising on Shareholder Base

In this section, we formally test whether advertising attracts investors (H1) using the regression models (1) and (2). Table 2 presents the regression coefficients. Note that the variable *AD* is included in model (2) while it is omitted in model (1). By construction, a positive and significant coefficient of *AD* indicates that shareholder base increases with advertising. The regression results reported in Table 2 support the prediction. The coefficient of $AD_{t\text{-}1}$ in model (2), shown in column 2, is positive and highly significant. The result is consistent with the findings in Grullon et al. (2004). All of the control variables exhibit significant coefficients. Firm size, turnover, and age affect shareholder base positively. Profitability (*ROA*), price, and idiosyncratic volatility are negatively associated with shareholder base. The signs of the control variables are generally in line with our predictions. The only exception is *ROA*, whose negative coefficient suggests that highly profitable firms tend to have a smaller shareholder base.

The regressions presented in Table 2 also generate the residual shareholder base ($RESDIF^+$) that will be used in the second-stage regression. $RESDIF^+$ displays strong negative correlations with the number of shareholders and firm age and a strong positive correlation with the Nasdaq dummy variable. This outcome offers preliminary evidence that the effect of the increased awareness due to advertising is stronger with firms with a smaller investor base, Nasdaq firms, and younger firms.

One issue worth noting is the potential for endogeneity between advertising expenditures and the number of shareholders. H1 predicts that greater spending in advertising leads to a greater shareholder base. However, a reverse causality is also possible because firms with a large shareholder base can afford to spend more resources in advertising. Hence, one may suspect that $RESDIF^+$ also captures the latter effect. However, if firms with a large shareholder base commit greater resources to advertising, it is most likely that they do so because the firms are large and simply have more resources. In our shareholder regression, we use firm size measured by the log of equity market capitalization as a control variable. Furthermore, we use the lagged term instead of the concurrent term for advertising expenditures in our shareholder base regression. Hence, the reverse causality from shareholder base to advertising is not likely an issue for $RESDIF^+$. In the following section, we discuss the results of the firm value regression.

4.3. The Effect of Increased Awareness due to Advertising on Firm Value

Table 3 reports the outcomes of the firm value regression of model (5). Panel A presents the results from panel regressions while Panel B shows the results from the Fama-MacBeth regressions. Both panels have eight columns each. Column 1 shows the regression outcomes for the entire sample. The remaining columns present the results for subsamples. Specifically, columns 2 and 3 show the results for partitioned samples based on the size of the shareholder base with the partition being made around the median of the number of shareholders. Columns 4 to 6 display outcomes by markets where the securities are traded. Columns 7 and 8 report the results from subgroups based on firm age. Before discussing the results regarding our key variable, $RESDIF^+$, we discuss the direct effect of advertising on firm value. While advertising could affect firm value indirectly via an expanded shareholder base (measured by $RESDIF^+$ in our framework), it could also affect firm value directly as a result of increased sales. Hence, it is important to control for the direct effect of advertising on firm value when examining the effect of $RESDIF^+$ on firm value. We include advertising expenditures along with sales revenues, both in concurrent terms, in the regression model. Given that the correlation between *AD* and the Q-ratio is

negative (Table 1), it is also interesting to see which sign the coefficient of $RESDIF^+$ displays in the regression framework. According to the regression results reported in Table 3, the coefficient of advertising expenditures (*AD*) is positive and significant for the entire sample as well as for most of the subsamples, indicating that advertising adds firm value through product markets.

Now we turn to the discussion on the effect of $RESDIF^+$ on the Q-ratio. We first discuss the results from the entire sample (Column 1) and then examine the results from the subsample analysis. For the entire sample, $RESDIF^+$ is positive and highly significant at the one percent level. The result reported in Column 1 renders strong support for our hypothesis that increased awareness through advertising enhances firm value (H2). Since *AD* is included in the model, the outcome is not contaminated by the direct, product-market effect of advertising on firm value.

For subsamples divided by the size of the shareholder base, $RESDIF^+$ shows opposite signs, depending on firm characteristics. For firms with a small shareholder base, $RESDIF^+$ is positive and significant at the one percent level. However, for firms with a large shareholder base, it has a negative coefficient that is also highly significant. Again, the coefficient of *AD* is significant with the positive sign for both subgroups. Combined, these results suggest that, with the direct positive effect of advertising on firm value being controlled for, the enhanced awareness by advertising helps firm value when the shareholder base is small, but not when the shareholder base is large. The finding confirms that lesser-known firms benefit more from increased awareness due to advertising.

While the positive coefficient of $RESDIF^+$ is consistent with our prediction, it is not clear why $RESDIF^+$ shows a negative effect on firm value for firms with a large shareholder base. One possible explanation can be inferred from the agency costs of having a large shareholder base. Increasing the shareholder base does not always contribute to firm value. While a larger shareholder base is certainly associated positively with firm value in Merton's framework, it may also hurt firm value because the enlarged shareholder base and the resultant dispersed ownership would increase agency costs due to the free-rider problem and less effective monitoring of firm management by shareholders (Jensen and Meckling, 1976). Ang, Cole, and Lin (2000) empirically demonstrate that agency costs are positively related to the number of outside shareholders. As long as the agency costs due to an increased shareholder base outweigh the benefits of added awareness by advertising, the overall value effect will be negative.

Columns 4 to 6 of Table 3 exhibit the regression results for the subsamples by markets. Column 4 shows the outcome for the NYSE and AMEX combined, column 5 for the NYSE only, and column 6 for Nasdaq only. The market-by-market analysis reveals that the positive effect of the advertising-to-shareholder base link on firm value is present for Nasdaq firms only. The coefficient of $RESDIF^{+}$ is positive and highly significant for the Nasdaq firms. This finding is consistent with our prediction that, in general, Nasdaq firms gain less attention, and thus advertising is more effective in increasing investor recognition and enhancing firm value for these firms. On the other hand, the effect is negative for non-Nasdaq firms. The negative effect appears to be driven by the NYSE firms because the magnitude of the negative coefficient of $RESDIF^{+}$ for the NYSE sample is greater and more significant than that for the NYSE-AMEX combined sample. The negative sign of $RESDIF^{+}$ for the NYSE firms might be attributable to the fact that NYSE firms are already well known in the market and, hence, there is a limit to the further gains to be earned by attracting more investors through advertising. Furthermore, the negative effect can also be understood in conjunction with the agency costs related to ownership dispersion mentioned previously. NYSE firms usually have a large shareholder base. The addition of shareholders via advertising could hurt firm value because of increased agency costs.

The analysis of the firm age subgroups reported in columns 7 and 8 also displays similar results. While $RESDIF^{+}$ is insignificant for older firms, it is positive and highly significant for younger firms. Like Nasdaq firms and firms with a smaller shareholder base, younger firms are likely to be less recognized by investors. Hence, they benefit more from advertising. Lastly, among the control variables, only advertising expenditures, *ROA*, assets, leverage, and turnover have significant coefficients. *ROA* and turnover have positive signs while assets and leverage have negative signs.

Panel B of Table 3 shows the results from the Fama-MacBeth regressions. The reported values are average coefficients from 37 annual regressions. Unlike the panel regression discussed earlier, where only a half of the variables display significant coefficients, most of the variables are significant. Other than this difference, the overall picture remains the same. $RESDIF^{+}$ is positive and significant at the one percent level for the whole sample. The variable is also positive and highly significant for firms with a small shareholder base, firms listed on Nasdaq, and young firms. It is negative and significant for firms with a large shareholder base and non-Nasdaq firms. *AD* is positive and significant regardless of the size of a shareholder base, listing venues, and age. Unlike the panel regression, almost all of the control variables

are significant: *ROA*, turnover, and idiosyncratic volatility show positive relations with firm value, and assets, sales, leverage, and illiquidity measured by *AMIHUD* display negative relations.

Put together, the regression results reported in Table 3 strongly suggest that increased investor awareness through advertising increases firm value. The strong results are firmly held regardless of whether a panel or a Fama-MacBeth regression approach is taken. The results also show that not all of the firms reap the benefits of increased awareness. It is those with a small investor base and those less known to the market, represented by Nasdaq firms and young firms, that benefit from the added awareness.

A couple of the results from Table 3 require additional explanation. The first is the negative effect of $RESDIF^+$ for firms with a large shareholder base and NYSE firms. While the effect of the advertising-shareholder link itself is negative for certain groups of firms, it does not mean that those firms should avoid investing in advertising. Recall that in the regression model (5) advertising has two channels to affect firm value: one through the direct channel via product markets and the other through the indirect channel via equity markets. Since *AD* has a positive coefficient, the combined effect of *AD* and $RESDIF^+$ may well offer a positive influence on firm value. In fact, there are a number of studies in the marketing area that investigate the relation between advertising and firm value (Conchar, Crask, and Zinkhan, 2005, McAlister, Srinivasan, and Kim, 2007, Fosfuri and Giarratana, 2009, Srinivasan, Pauwels, Silva-Risso, and Hanssen, 2009, and Joshi and Hanssens, 2010, to name a few). These studies generally support the hypothesis that advertising increases firm value. Our study demonstrates that advertising enhances firm value in two channels, direct and indirect. In addition, the findings in our paper give further insights on the relation between brand equity and stock price that is extensively researched in marketing. Simon and Sullivan (1993), Aaker and Jacobson (1994), Kerin and Sethuraman (1998), and Madden, Fehle, and Fournier (2006) report a significant association between the two variables. Since one of the most effective methods to enhance brand equity is to actively engage in advertising and promotion, the positive association between brand equity and firm value may also be understood in the framework illustrated in this study.

The second issue is related to the different sample periods between the NYSE/AMEX firms and the Nasdaq firms. Recall that the exchange firms are covered over the 37 years from 1975 to 2011. The sample period for the Nasdaq firms spans only 30 years from 1982 to 2011. The opposite signs of $RESDIF^+$ between NYSE/AMEX firms and Nasdaq firms may well be driven by the difference in the

sample periods. In addition, since Nasdaq firms generally have a smaller shareholder base than exchange listed firms, the different results between firms with a large shareholder base and those with a small shareholder base could also be attributable to the difference in time coverage of the two samples. This issue will be addressed later when we discuss our subperiod analysis.

4.4. Supplementary Tests

In this subsection, we offer analyses that supplement the firm value regressions discussed above. We start with a discussion of the regression interaction terms and then present regression outcomes when the differenced $RESDIF^+$ is used in the regressions.

The subsample analysis presented in Tables 3 demonstrates that the subsamples display different value effects of the advertising induced residual shareholder base. However, they do not provide a statistical test to verify that the effects of $RESDIF^+$ are different among the subgroups. In the following analysis, we offer a formal statistical test to complement the subgroup analysis using interaction terms between $RESDIF^+$ and dummy variables that represent different characteristics of the subsamples. More specifically, we use three interaction terms between $RESDIF^+$ and dummy variables for shareholder base ($RESDIF^+ \times SMALL_NSH$), listed market ($RESDIF^+ \times NASDAQ$), and firm age ($RESDIF^+ \times AGE$). According to the findings from Table 3, it is predicted that all three interaction terms produce statistically significant and positive coefficients. The results are reported in Table 4. The first three columns show the coefficients from panel regressions while the last three present the coefficients from the Fama-MacBeth regressions. Consistent with the prediction, all three interaction terms have positive coefficients that are all highly significant. Meanwhile, $RESDIF^+$ is significantly negative when the small shareholder base and Nasdaq dummies are used, again consistent with the earlier finding that firms with a large shareholder base and non-Nasdaq firms face a negative value effect of an increased shareholder base.

The analyses so far have examined how firm value is affected by advertising in a given year. In the following analysis, we explore how changes in shareholder base triggered by advertising are related to changes in firm value. The dependent variable used in the model is changes in the Q-ratio from year t-1 to t (ΔQ). Our key independent variable is changes in $RESDIF^+$ from t-1 to t ($\Delta RESDIF^+$). Also included in the model are changes in advertising (ΔAD), return on equity (ΔROA), and sales ($\Delta SALES$) along with the lagged values of these three variables and other control variables ($AD_{t\text{-}1}$, $ROA_{t\text{-}1}$, $ASSETS_{t\text{-}1}$, $LEV_{t\text{-}1}$, $TO_{t\text{-}1}$, $IDIO_{t\text{-}1}$, and $AMIHUD_{t\text{-}1}$). The inclusion of ΔAD will eliminate any direct, product-market effects of

advertising on firm value changes. The calculation of changes in the variables requires that all of the relevant accounting data be present in both the year before and the given year. This reduces the number of observations, and the sample size is smaller than the one used in the previous analyses. The estimation results are shown in Table 5, with the results from the panel regressions reported in Panel A and from the Fama-MacBeth regression presented in Panel B. Again, the same positive influence of the differences in the residual shareholder base on firm value continues to hold. $\Delta RESDIF^{+}$ is positive and significant in both the panel and Fama-MacBeth regressions. The only difference from the previous analysis (Table 4) is that the interaction term between RESDEIF+ and the age dummy loses its statistical significance. Except for the weak result for the age interaction term, the overall results in Table 5 corroborate the earlier finding that the increase in shareholder base induced by advertising increases firm value.

4.5. Subperiod Analysis

In this subsection, we examine whether the positive link from advertising to firm value via shareholder base is time variant. Our long investigation period of 37 years allows us to perform a subperiod analysis with a reasonable length for each subperiod. In addition, a subperiod analysis might shed light on the question of whether the different pattern of outcomes between the Nasdaq and exchange samples reported previously is simply a manifestation of the different time coverage of the two samples. We divided the entire 37 years of our sample period into four subperiods. The first subperiod is seven years long from 1975 to 1981 and contains NYSE/AMEX firms only. The remaining 30 years from 1982 to 2011 are split into three 10-year subperiods. These last three subperiods cover both the NYSE/AMEX sample and the Nasdaq sample. We estimate a panel regression of Q-ratios on $RESDIF^{+}$ and the same set of control variables used previously.

The results of the subperiod regressions are reported in Table 7. For the NYSE/AMEX sample, the coefficients of $RESDIF^{+}$ are generally negative, with three out of the four subperiods yielding negative values and only one of the negative coefficients being significant. However, for the Nasdaq sample, all three subperiods display a strong positive effect of $RESDIF^{+}$. The coefficients are large and highly significant at the one percent level. Interestingly, a distinct time-series pattern is shown among the subperiod results: the influence of $RESDIF^{+}$ on firm value diminishes over time. The coefficient of $RESDIF^{+}$ decreases monotonically from 0.174 to -0.122 to -0.337 and to -0.737 for the NYSE/AMEX firms and from 2.93 to 2.67 to 0.65 for the Nasdaq firms. Hence, one can infer that the linkage from advertising to firm value via shareholder base has weakened over time. The evidence supports our last

hypothesis (H3). With the dramatic growth of the securities and media industries in recent years, company information is more widely available and accessible. Developments in information technology have contributed significantly to the process. Internet investment sites generate a large amount of information about prospective stocks on a daily basis. One of the greatest beneficiaries of this change in the information environment may be small, less-recognized firms. In the past, firms that were not recognized widely had few channels to communicate with investors. Advertising might have been the most effective way. However, with a variety of alternative channels available now, which are far less costly and more effective, advertising is not as effective as before as a tool to attract investors' attention and thereby increase firm value.

5. Concluding Remarks

An empirical verification of Merton's investor recognition hypothesis (1987) is a challenging task because the mechanism works through an implicit channel. To test Merton's hypothesis, we offer a new empirical approach that links advertising, shareholder base, and firm value. Specifically, we employ a two-stage regression approach where we obtain the residual shareholder base attributable to advertising in the first-stage regression and use it in the second-stage regression of firm value. Our sample covers stocks traded on the NYSE, AMEX, and Nasdaq and spans 37 years from 1975 to 2011.

We find strong evidence that supports Merton's hypothesis. We find that advertising increases shareholder base. Since we control for firm size, it is unlikely that the positive effect of advertising on shareholder base is due to the feedback effect of a large firm size resulting in a large amount of advertising. Secondly, we find that the addition to shareholder base due to advertising increases firm value. However, not all firms enjoy the benefits of added investor recognition due to advertising. It is those that are less known to the market that reap the positive valuation effect. More specifically, the positive valuation effect is observed only for firms with a small investor base, firms that trade on Nasdaq, and firms that are relatively young. Firms with a large shareholder base, NYSE firms, and relatively older firms do not benefit much from the added recognition due to advertising. In short, firms that are already well known to investors do not gain from the added awareness due to advertising. Finally, we find that the effect of advertising on firm value by way of the indirect channel of the shareholder base has weakened gradually over the last three decades. We conjecture that the recent developments of the media industry and information technology have contributed to this phenomenon.

Our study links two recent strands of research in finance that explore the effect of investor recognition on firm value; one examining how the breadth of ownership affects stock returns and the other investigating the role of advertising on stock returns. Our approach explicitly explores the mechanism through which advertising influences the breadth of ownership, which in turn affects firm value. Our analysis is also closely related to marketing studies about the effects of advertising and brand equity on firm value.

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Table 1. Descriptive statistics

This table presents descriptive statistics for the sample firms and Pearson correlations between variables. The statistics are from the entire set of 4,480 firms in the sample spanning 37 years from 1975 to 2011 (34,549 firm year observations). For a stock to be included in the sample in a year, the entire set of variables that are used in the analysis should be available from the COMPUSTAT and CRSP databases. AD is the natural logarithm of advertising expenditures. NSH is the natural logarithm of the number of common shareholders. Q is the q-ratio and defined as the market value of equity plus the book value of debt divided by the book value of assets. SIZE is the natural logarithm of equity market capitalization. ROA is earnings before interest and taxes before depreciation and amortization divided by the book value of total assets. TO measures turnover and is defined as the natural logarithm of annual average monthly trading volume divided by the number of common shares outstanding. LEV stands for leverage and is calculated as the book value of total debt divided by the book value of total assets. IDIO is the standard deviation of the residuals estimated from Fama-French three factor model using sixty monthly returns before the end of a fiscal year. PRICE is the natural logarithm of a closing price at yearend. ASSETS is the natural logarithm of the book value of total assets. SALES is the natural logarithm of sales revenues. AGE is defined as the number of years the firm has existed on the COMPUSTAT database. AMIHUD is the Amihud (2002) measure, which is defined as the absolute value of daily return divided by daily dollar volume, averaged over the year and then multiplied by 10^5. ROLL is Roll's spread with the adjustment introduced by Lesmond (2005) and defined as the square root of the absolute value of serial covariance of daily returns.

Panel A. Descriptive Statistics

	Mnemonic	Mean	Std. Dev.	5th perctl.	Median	95th perctl.
Main Variables						
Log(Advertising Expenditures)	*AD*	15.325	2.458	11.451	15.274	19.509
Log(No. of Shareholders)	*NSH*	7.648	1.915	4.605	7.553	10.948
Q-Ratio	*Q*	1.852	1.980	0.750	1.364	4.428
Control Variables						
Log(Market Value of Equity)	*SIZE*	19.250	2.200	15.894	19.133	23.083
Return on Assets	*ROA*	0.112	0.377	-0.117	0.129	0.298
Log(Share Turnover)	*TO*	-0.425	1.137	-2.327	-0.407	1.367
Idiosyncratic Volatility	*IDIO*	0.122	0.059	0.052	0.109	0.238
Log(Price)	*PRICE*	2.592	1.045	0.688	2.718	4.071
Log(Age)	*AGE*	2.678	0.733	1.386	2.708	3.807
Log(Book Value of Assets)	*ASSETS*	19.458	2.150	16.304	19.249	23.305
Log(Sales)	*SALES*	19.452	2.083	16.255	19.361	23.014
Leverage	*LEV*	0.171	0.196	0.000	0.123	0.523
Amihud Measure $\times 10^5$	*AMIHUD*	0.366	3.052	0.000	0.006	1.348
Roll's Spread	*ROLL*	0.010	0.010	0.002	0.008	0.028

Table 1. (Continued)

Panel B. Pearson Correlations

	NSH	*Q*
NSH		-0.0552***
AD	0.5238***	-0.0432***
ROA	0.0685***	-0.1944***
TO	-0.0572***	0.1838***
IDIO	-0.4007***	0.1477***
PRICE	0.3561***	
AGE	0.4487***	
SIZE	0.4518***	
ASSETS		-0.0889***
SALES		-0.0158***
LEV		-0.0916***
AMIHUD		-0.0367***

*** indicates significance at the 1 percent level.

Table 2. the Effects of Advertising Expenditures on Shareholder Base

This table presents the coefficient estimates of the panel regressions of the number of shareholders. Models (1) and (2) are identical in terms of variable composition except that model (2) includes advertising expenditures while model (1) does not. The dependent variable is the number of common shareholders (NSH). The independent variables include lagged advertising expenditure (AD_{t-1}), equity market capitalization (SIZE), return on assets (ROA), turnover (TO), residual standard deviation from the three factor Fama-French regression (IDIO), price (PRICE), firm age (AGE), dummy variables for each year in the sample period, and industry dummy variables. Among the variables, SIZE, TO, PRICE, and AGE are log-transformed due to skewedness in distribution. The industry dummies are defined by the 48 Fama and French (1997) industry specifications. Significance levels are reported using robust standard errors adjusted for clustering by years and industries. *, **, *** denote significance levels of 10%, 5%, and 1%, respectively.

Dependent variable: *NSH*	(1)	(2)
Intercept	-1.853***	-1.878***
AD_{t-1}		0.164***
SIZE	0.599***	0.467***
ROA	-0.135**	-0.109**
TO	0.111***	0.092***
IDIO	-3.316***	-2.653***
PRICE	-0.598***	-0.556***
AGE	0.756***	0.690***
Year	YES	YES
Industry	YES	YES
Clustering	Year & Industry	Year & Industry
N	34549	32434
No. of firms	4480	4328
Adjusted R^2	0.515	0.533

Table 3. Regression of Firm Value on Incremental Shareholder Base Using RESDIF$^+$

This table presents the coefficient estimates of the panel regressions of firm value (Panel A) and the cross-sectional means of the coefficients estimated from Fama-MacBeth regressions of firm value (Panel B) on the entire sample and subsamples based on the number of shareholders (small vs. large), listed markets (Nasdaq vs. exchanges), and age (old vs. young). The dependent variable is Q-ratio. The key independent variable is the differences in residuals from the first-stage regressions of shareholder base with and without advertising expenditures conditional on both residuals having the same sign and the residual with advertising expenditures being smaller than one without advertising expenditures (RESDIF$^+$). Other independent variables are advertising expenditures (AD), return on assets (ROA), the book value of assets (ASSESTS), sales revenues (SALES), leverage (LEV), turnover (TO), residual standard deviation from the three factor Fama-French regression (IDIO), Amihud liquidity measure (AMIHUD), Roll's spread (ROLL), a dummy variable for each year in the sample period, and industry dummy variables. Among the independent variables, AE, ASSETS, and SALES are log-transformed due to skewedness in distribution. The industry dummies are defined by the 48 Fama and French(1997) industry specifications. Significance tests for the panel regression (Panel A) are based on robust standard errors clustered by years and industries. Significance tests for Fama-MacBeth coefficients (Panel B) are based on Newey-West corrected standard errors. *, **, *** denote significance levels of 10%, 5%, and 1%, respectively.

Panel A. Panel Regression

		No. of Shareholders		Listed Markets			Firm Age	
Dependent variable: *Q*	(1) All	(2) Small	(3) Large	(4) NYSE/AMEX	(5) NYSE	(6) Nadsaq	(7) Old	(8) Young
Intercept	4.746***	2.607***	2.568***	2.496***	1.513***	5.512***	3.170***	6.268***
RESDIF$^+$	0.481**	2.535***	-1.069***	-0.372*	-0.460**	1.550***	0.177	0.694*
AD	0.086***	0.239***	0.202***	0.078***	0.065**	0.179***	0.118***	0.063*
ROA	-1.032	-6.067**	-0.501***	3.228***	6.115***	-1.077	2.323	-1.069
ASSETS	-0.420**	-0.927***	-0.333***	-0.079	0.055	-0.581*	0.096*	-0.617**
SALES	0.208	0.743**	0.132**	-0.072	-0.176***	0.258	-0.283***	0.35
LEV	-0.549**	-0.259	-0.358	-0.201	0.010	-0.668*	-0.329	-0.538*
TO	0.348***	0.553***	0.077*	0.088**	0.008	0.495***	0.138***	0.459***
IDIO	-2.506***	-6.551***	-1.328**	0.339	0.621	-3.177**	0.924	-3.491***
AMIHUD	-0.012	-0.005	-0.044**	-0.005	-0.035	-0.020	-0.022*	-0.007
Year	YES	YES	YES	YES	YES	YES	YES	YES
Industry	YES	YES	YES	YES	YES	YES	YES	YES
Standard error clustering	Year & Ind.	Year & Ind.	Year & Ind.	Year & Ind.	Year & Ind.	Year & Ind.	Year & Ind.	Year & Ind.
N	15767	7885	7882	8542	7132	7225	7903	7864
No. of firms	3196	2122	1424	1466	1101	1730	1471	2351
Adjusted R^2	0.181	0.392	0.299	0.299	0.456	0.195	0.254	0.187

Table 3. (Continued)

Panel B. Fama-MacBeth Regression

		No. of Shareholders		Listed Markets			Firm Age	
Dependent variable: *Q*	(1) All	(2) Small	(3) Large	(4) NYSE/AMEX	(5) NYSE	(6) Nadsaq	(7) Old	(8) Young
Intercept	4.684***	4.349***	2.879***	2.668***	2.037***	6.630***	2.650***	6.139***
RESDIF^{+}	0.647***	2.743***	-0.822***	-0.280*	-0.320**	2.443***	0.122	1.027***
AD	0.133***	0.291***	0.219***	0.101***	0.069***	0.251***	0.131***	0.102***
ROA	1.515***	1.230***	3.233***	4.224***	6.416***	0.846**	3.870***	1.229**
ASSETS	-0.113*	-0.307***	-0.084*	-0.040	0.107**	-0.267***	0.091*	-0.258***
SALES	-0.145**	-0.060	-0.161***	-0.112***	-0.221***	-0.156***	-0.275***	-0.047
LEV	-0.477***	-0.394***	-0.479***	-0.365***	-0.313***	-0.535***	-0.485***	-0.603***
TO	0.225***	0.323***	0.003	0.019	-0.044*	0.313***	0.059	0.330***
IDIO	0.124	-0.337	1.807*	1.450*	1.335***	-0.880	1.879	-0.794
AMIHUD	-0.167***	-0.135**	-0.429***	-0.604	-3.701	-0.302**	-0.190***	-0.270**
Industry	YES	YES	YES	YES	YES	YES	YES	YES
Standard error clustering	Newey-West.	Newey-West.	Newey-West	Newey-West	Newey-West	Newey-West.	Newey-West.	Newey-West.
N	15767	7885	7882	8542	7132	7225	7903	7864
No. of firms	3196	2122	1424	1466	1101	1730	1471	2351
Adjusted R^2	0.255	0.315	0.351	0.357	0.476	0.270	0.369	0.256

Table 4. Regressions of Firm Value with Interaction Terms

This table presents the coefficient estimates of the panel regressions of firm value and the cross-sectional means of the coefficients from Fama-MacBeth regressions of firm value. The dependent variable is Q-ratio. Both models use interaction terms between the positive differences in residuals of a same sign from the first-stage regressions of shareholder base with and without advertising expenditures ($RESDIF^+$) and dummy variables for the number of shareholders (NSH_SMALL), listed markets (NASDAQ), and age (AGE). NSH_SMALL takes the value of one if the number of shareholders of a firm is smaller than the sample median and zero otherwise. NASDAQ takes the value of one if the stock is traded on Nasdaq and zero otherwise. AGE takes the value of one if a firm's age is less than the median age and zero otherwise. The independent variables also include RESDIF, advertising expenditures (AD), return on assets (ROA), the book value of assets (ASSESTS), sales revenues (SALES), leverage (LEV), turnover (TO), residual standard deviation from the three factor Fama-French regression (IDIO), Amihud liquidity measure (AMIHUD), Roll's spread (ROLL), a dummy variable for each year in the sample period, and industry dummy variables. Among the independent variables, AE, ASSETS, and SALES are log-transformed due to skewedness in distribution. The industry dummies (IND) are defined by the 48 Fama and French(1997) industry specifications. Significance tests for the panel regression (Panel A) are based on robust standard errors clustered by years and industries. Significance tests for Fama-MacBeth coefficients (Panel B) are based on Newey-West corrected standard errors. *, **, *** denote significance levels of 10%, 5%, and 1%, respectively.

	Panel regressions			Fama-MacBeth regressions		
Dependent variable: *Q*	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	3.237***	4.241***	4.545***	3.301***	4.035***	4.443***
RESDIF$^+$	-1.355***	-0.336	0.120	-0.816***	-0.173	0.293*
AD	0.249***	0.113***	0.087***	0.261***	0.160***	0.131***
ROA	-1.062	-1.019	-1.030	1.374***	1.502***	1.496***
ASSETS	-0.478**	-0.431**	-0.420**	-0.192***	-0.126**	-0.118**
SALES	0.223	0.227	0.215	-0.093*	-0.117**	-0.125**
LEV	-0.454*	-0.459*	-0.561**	-0.419***	-0.410***	-0.502***
TO	0.318***	0.324***	0.341***	0.201***	0.191***	0.215***
IDIO	-1.877**	-2.621***	-2.661***	0.534	0.141	-0.022
AMIHUD	-0.012	-0.011	-0.012	-0.156***	-0.158***	-0.161***
RESDIF $^+$× *SMALL_NSH*	3.913***			3.233***		
RESDIF $^+$× *NASDAQ*		1.772***			1.764***	
RESDIF$^+$ × *AGE*			0.599*			0.678***
Year	YES	YES	YES			
Industry	YES	YES	YES	YES	YES	YES
Standard errors	Year & Ind.	Year & Ind.	Year & Ind.	Newey-West	Newey-West	Newey-West
N	15767	15767	15767	15767	15767	15767
No. of firms	3196	3196	3196	3196	3196	3196
Adjusted R^2	0.206	0.187	0.182	0.289	0.267	0.258

Table 5. Regression of Changes in Firm Value on Changes in Incremental Shareholder Base

This table presents the coefficient estimates of the panel regressions of annual changes in firm value (Panel A) and the cross-sectional means of the coefficients from Fama-MacBeth regressions of annual changes in firm value (Panel B). The dependent variable is year-to-year changes in Q-ratio (ΔQ). The independent variables include changes in $RESDIF^+$ ($\Delta RESDIF^+$), change in advertising expenditures (ΔAD), lagged advertising expenditures (AD_{t-1}), change in return on assets (ΔROA), lagged return on assets (ROA_{t-1}), lagged book value of assets ($ASSESTS_{t-1}$), changes in sales (ΔSALES), lagged leverage (LEV_{t-1}), turnover (TO), lagged residual standard deviation from the three factor Fama-French regression ($IDIO_{t-1}$), lagged Amihud liquidity measure ($AMIHUD_{t-1}$), a dummy variable for each year in the sample period, and industry dummy variables. Also included in the model are interaction terms between $RESDIF^+$ and dummy variables of NSH_SMALL, NASDAQ, and AGE where NSH_SMALL takes the value of one if the number of shareholders of a firm is smaller than the sample median and zero otherwise, NASDAQ takes the value of one if the stock is traded on Nasdaq and zero otherwise, and AGE takes the value of one if a firm's age is less than the median age and zero otherwise. Among the independent variables, AE_{t-1}, $ASSETS_{t-1}$, and $SALES_{t-1}$ are log-transformed due to skewedness in distribution. The industry dummies are defined by the 48 Fama and French(1997) industry specifications. Significance tests for the panel regression (Panel A) are based on robust standard errors clustered by years and industries. Significance tests for Fama-MacBeth coefficients (Panel B) are based on Newey-West corrected standard errors. *, **, *** denote significance levels of 10%, 5%, and 1%, respectively.

Panel A. Panel Regression

Dependent variable: ΔQ	(1)	(2)	(3)	(4)
Intercept	0.020	0.094	0.016	0.018
$\Delta RESDIF^+$	1.568***	-1.096**	0.614***	1.304***
AD_{t-1}	0.005	0.018	0.007	0.005
ΔAD	-0.109**	-0.118**	-0.109**	-0.109**
ROA_{t-1}	-0.644	-0.660	-0.641	-0.643
ΔROA	0.935	0.757	0.892	0.935
$ASSETS_{t-1}$	0.001	-0.013	-0.001	0.001
$\Delta SALES$	-0.083	-0.087	-0.085	-0.083
LEV_{t-1}	0.189	0.195*	0.194*	0.188
TO_{t-1}	-0.053**	-0.040*	-0.052**	-0.053**
$IDIO_{t-1}$	-0.463	-0.621	-0.467	-0.468
$AMIHUD_{t-1}$	-0.001	0.000	-0.001	-0.001
$\Delta RESDIF^+ \times SMALL_NSH$		3.993***		
$\Delta RESDIF^+ \times NASDAQ$			1.505***	
$\Delta RESDIF^+ \times AGE$				0.412
Year	YES	YES	YES	YES
Industry	YES	YES	YES	YES
Standard Errors	Year & Ind. Clust.	Year & Ind. Clust.	Year & Ind. Clust.	Year & Ind. Clust.
N	10771	10771	10771	10771
No. of Firms	2308	2308	2308	2308
Adjusted R^2	0.085	0.106	0.088	0.085

Table 5. (Continued)

Panel B. Fama-MacBeth Regression

Dependent variable: ΔQ	(1)	(2)	(3)	(4)
Intercept	-0.215	-0.155	-0.203	-0.235
$\Delta RESDIF^{+}$	1.675***	-0.563	0.661***	1.400***
AD_{t-1}	-0.004	0.002	-0.006	-0.003
ΔAD	-0.078	-0.080*	-0.080*	-0.076
ROA_{t-1}	-0.328	-0.343	-0.316	-0.329
ΔROA	1.498***	1.415***	1.530***	1.482***
$ASSETS_{t-1}$	0.016	0.008	0.017	0.016
$\Delta SALES$	-0.162	-0.157	-0.16	-0.166*
LEV_{t-1}	0.179**	0.163**	0.159**	0.172**
TO_{t-1}	-0.026	-0.018	-0.027	-0.026
$IDIO_{t-1}$	-0.107	-0.158	-0.11	-0.088
$AMIHUD_{t-1}$	0.026	0.020	0.023	0.022
$\Delta RESDIF^{+} \times SMALL_NSH$		3.431***		
$\Delta RESDIF^{+} \times NASDAQ$			1.685**	
$\Delta RESDIF^{+} \times AGE$				0.425
Industry	YES	YES	YES	YES
Standard Errors	Newey-West	Newey-West	Newey-West	Newey-West
N	10771	10771	10771	10771
No. of Firms	2308	2308	2308	2308
Adjusted R^2	0.167	0.192	0.173	0.168

Table 6. Regression of Firm Value: Sub-Period Analysis

This table presents the coefficient estimates of the panel regressions of annual changes in firm value for sub-periods. The dependent variable is Q-ratio. The independent variables are the positive differences in residuals of a same sign from the first-stage regressions of shareholder base with and without advertising expenditures ($RESDIF^+$) as a dependent variable, advertising expenditures (AD), return on assets (ROA), the book value of assets (ASSESTS), sales revenues (SALES), leverage (LEV), turnover (TO), residual standard deviation from the three factor Fama-French regression (IDIO), Amihud liquidity measure (AMIHUD), dummy variables for each year in the sample period, and industry dummy variables. Among the independent variables, AE, ASSETS, and SALES are log-transformed due to skewedness in distribution. The industry dummies (IND) are defined by the 48 Fama and French(1997) industry specifications. Significance tests are based on robust standard errors clustered by years and industries. *, **, *** denote significance levels of 10%, 5%, and 1%, respectively. *, **, *** denote significance levels of 10%, 5%, and 1%, respectively.

Exchange	NYSE & AMEX				NASDAQ		
Period	1975-1981	1982-1991	1992-2001	2002-2011	1982-1991	1992-2001	2002-2011
Intercept	0.923*	3.990***	2.477***	3.755***	7.893***	2.371*	6.777***
RESDIF$^+$	0.174	-0.122	-0.337	-0.737***	2.933***	2.666**	0.653
AD	0.051**	0.117***	0.077	0.096**	0.414***	0.130	0.177***
ROA	3.002***	2.861***	3.179*	3.335**	0.155	1.275	-1.093
ASSETS	0.077	-0.090	-0.301	-0.122	-0.392**	0.041	-0.946
SALES	-0.146**	-0.151	0.175	-0.061	-0.299	-0.204	0.568
LEV	-0.173	-0.692**	-0.336	0.176	-0.546	-0.891*	-0.424
AMIHUD	-0.011	-0.004	-0.056**	-0.037	-0.026	-0.057	-0.008
TO	-0.003	0.090**	0.114	0.123	0.300***	0.406***	0.635***
IDIO	2.547*	0.149	-1.232	0.637	-3.401*	-0.991	-3.203*
Year	YES	YES	YES	YES	YES	YES	YES
Industry	YES	YES	YES	YES	YES	YES	YES
Standard error clustering	Year & Industry	Year & Industry	Year & Industry	Year & Industry	Year & Industry	Year & Industry	Year & Industry
N	1999	2415	1623	2505	1734	1928	3563
Adjusted R^2	0.304	0.293	0.344	0.29	0.219	0.199	0.233