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Digital versus traditional advertising and the recognition of brand intangible assets

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BOSTON UNIVERSITY
QUESTROM SCHOOL OF BUSINESS

Dissertation

**DIGITAL VERSUS TRADITIONAL ADVERTISING AND
THE RECOGNITION OF BRAND INTANGIBLE ASSETS**

by

XIAOTONG SONG

B.A., Sun Yat-sen University, 2012
M.B.A., State University of New York at Binghamton, 2014
M.S.A., State University of New York at Binghamton, 2015

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Approved by

First Reader

Edward J. Riedl, Ph.D.
John F. Smith, Jr. Professor in Management
Professor and Chair of Accounting

Second Reader

Petro Lisowsky, Ph.D.
Dean's Research Scholar
Associate Professor of Accounting

Third Reader

Shuba Srinivasan, Ph.D.
Adele and Norman Barron Professor in Management
Professor and Chair of Marketing

Fourth Reader

Yuan Sun, Ph.D.
Dean's Research Scholar
Assistant Professor of Accounting

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Boston University Questrom School of Business, 2020

Major Professor: Edward J. Riedl, Ph.D., John F. Smith, Jr. Professor in Management,
Professor and Chair of Accounting

ABSTRACT

This paper examines how different advertising media affect the occurrence and nature of brand asset recognition. Prior research documents that advertising is positively associated with firm sales and brand value. However, this latter research focuses on aggregate advertising expenditures, which ignores a major trend in recent years wherein advertising expenditures have shifted from traditional channels (such as TV and newspaper) to digital advertising (primarily paid search and online display). Using proprietary data, I exploit this trend and decompose advertising expenditures into three core component elements—traditional, online display, and paid search—to examine how key advertising media affect subsequent brand asset recognition arising in the context of acquisitions. Consistent with expectations, I find that subsequent to acquisition, target firms’ traditional and online display advertising exhibit a higher likelihood of brand asset recognition, higher recognized brand asset values, and longer amortization schedules, as compared to paid search advertising. I also document higher deal premiums for targets, which spend more on traditional advertising. Affirming the acquirer’s recognition of a brand asset, additional results reveal that investors react positively to the initially recognized brand amount, and that those brand intangible assets are positively associated

with acquirer future revenue. Overall, these results confirm expected heterogeneous effects of different advertising channels on the recognition and characteristics of the underlying brand asset.

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LIST OF ABBREVIATIONS

ASC	Accounting Standards Codification
CAR	Cumulative Abnormal Return
CRSP	Center for Research in Securities Prices
EDGAR	Electronic Data Gathering, Analysis, and Retrieval
FASB	Financial Accounting Standards Board
GAAP	Generally Accepted Accounting Principles
IAB	Internet Advertising Bureau
M&A	Mergers and Acquisitions
RFR	Relief from Royalty
OLS	Ordinary Least Squares
SEC	U.S. Securities and Exchange Commission
SFAS	Statement of Financial Accounting Standard
SG&A	Selling, General and Administrative Expenses
SIC	Standard Industrial Classification
SOX	Sarbanes-Oxley Act

DIGITAL VERSUS TRADITIONAL ADVERTISING AND THE RECOGNITION OF BRAND INTANGIBLE ASSETS

1. INTRODUCTION

The past decade has witnessed a rapid and sustained rise in new advertising channels—collectively referred to as “digital advertising.” The Interactive Advertising Bureau (IAB) indicates that digital advertising recently surpassed television to become the largest advertising channel, exceeding \$100 billion in aggregate for 2018 in the US (IAB 2018). Despite the dramatic rise of this new media, accounting research does not examine how the various media channels affect either firms’ reporting decisions or economic outcomes; this is likely because typical data sources (such as Compustat) do not disaggregate advertising expenditures into its various channels. In this paper, I use an alternative dataset that provides this decomposition, and examine how different advertising media create long-term value as reflected in managers’ reporting decisions for a key advertising asset: brands.

I address this research question in the setting of mergers and acquisitions (hereafter “M&A”). Accounting Standards Codification (ASC) 805 requires that acquirer firms recognize intangible assets of the target, including brand assets, separately on the balance sheet during M&A. Subsequent to recognition, the fair value and amortization schedule of the brand asset also must be disclosed. Consistent with marketing theory, I assume that a primary economic input that builds the target firm’s brand asset includes the firm’s previous advertising expenditures. As any target firm’s brand asset must be recognized following the M&A as part of the purchase price allocation, this setting

allows me to directly test manager's perceptions of value creation by alternative advertising channels, as reflected in their reporting decisions regarding the recognition of brand intangible assets after the M&A is completed.

Prior marketing research suggests that different types of advertising have varying effects on firm performance (e.g., Bayer et al. 2019). These advertising channels are divided into three broad categories: paid search, online display, and traditional. Paid search is a type of digital advertising initiated by users: users search for a keyword on a search engine (e.g., Google, Bing, or Baidu) and obtain relevant ads appearing as sponsored links. This advertising possesses a high target ability (Goldfarb and Tucker 2011) and has been shown to deliver strong contemporaneous sales impact (Bayer et al. 2019), thus appearing more short-term in nature. Online display represents a second type of digital advertising; it comprises online banner, plain text ads, rich media ads, and online video ads. While sharing some characteristics of paid search—such as the ability to track and store consumer data—it is a “push” form of advertising, which is initiated by firms with an intent of building brand awareness (Sundar and Kim 2005). Traditional advertising reflects all offline advertising outlets including television, magazine, newspaper, radio, and outdoor. Similar to online display, traditional advertising is initiated by firms to create positive brand associations to a wider customer audience. Prior research suggests that both traditional and online display have long-term effects that include reputation-building, such as enhanced pricing premium and/or long-term customer retention (Draganska et al. 2013). That is, both appear to more strongly map into the notion inherent in the long-term asset of a brand, which the FASB defines as the

ability to “distinguish from the products of others” (ASC 805). In contrast, paid search appears most strongly associated with immediate sales impact. Thus—consistent with both marketing theory regarding the characteristics of these media channels, and with the FASB conceptual notion of a brand asset—I predict that the recognition, value, and useful life of a brand asset will have a higher association with traditional and online display expenditures relative to those for paid search, and that managers will pay a higher premium for traditional and online display. I validate these predictions in the context of M&A, which is one of the only settings to directly observe recognized brand assets acquired from target firms, as well as the purchase price by acquirer firms.

To obtain the decomposition of advertising expenditures into the three major types (paid search, online display, and traditional), I use a proprietary dataset by Kantar of annual advertising activities in multiple media channels over a six-year period (2010-2016). Kantar is an industry leading media-tracking company, which provides firms’ advertising spending on major media outlets through systematic monitoring of firms’ advertising activities. Consistent with expectations, results confirm that both traditional and online display advertising of target firms exhibit a higher association with the recognition of brand assets relative to paid search. In addition, I find relatively higher recognized brand asset values and longer amortization schedules for traditional and online display advertising, as determined by the acquirer firms through their purchase price allocations. I also document that the premium paid by acquirer firms is relatively higher for traditional advertising. Finally, I confirm that investors react positively to the amount of brand assets, and that the brand intangible assets generate multiple periods of

benefits as reflected in future revenues for the acquirer firms. Both of the latter results provide preliminary support that the acquirer's recognition of the brand reflects an underlying economic asset. The main results are robust to a battery of sensitivity tests using alternative variable measurements and controlling for target selection bias, brand recognition bias, and advertising endogeneity.

This study makes three contributions. First, there is a long-standing debate regarding the long-term effects, and thus appropriate reporting, of advertising expenditures. Under extant US and international standards, most advertising expenditures must be expensed as incurred. Prior studies generally use the aggregated advertising expense with an implicit assumption that the aggregate effects can be attributed to each of the components equally (e.g., Fee et al. 2008; Lou 2014; Chenmanur and Yan 2019). This paper provides new evidence on the differential effects of advertising channels on brand recognition, valuation and purchase premium. Second, despite the enormous shift in advertising expenditures away from traditional to digital advertising in recent years, empirical evidence comparing the effects of these different channels is scarce. The few related studies focus on marketing outcomes such as customer retention rate, click-through rate, and brand awareness (e.g., Danaher and Dagger 2013; Dinner et al. 2013). This paper builds on these studies by examining brand recognition as the outcome variable; this links the heterogeneous effects of alternative advertising media to observed reporting outcomes, and thus bridges the marketing and accounting research domains. Third, my study contributes to the literature on intangible assets during mergers and acquisitions (e.g., Wyatt 2005; Zhang and Zhang 2017). As

M&A has increased in recent years, the recognition and valuation of the related intangible assets has become of greater interest. Prior studies document both the economic drivers and managerial incentives associated with brand asset recognition (e.g., Muller 1999; Wyatt 2005). This paper adds to this literature by documenting that different types of advertising play varying roles in determining brand asset and valuation. Section 2 surveys the literature on advertising and value relevance, digital versus traditional advertising, and intangible asset during mergers and acquisitions. Section 3 describes the research design. Section 4 presents the sample selection process and descriptive statistics. Section 5 provides the primary empirical results, with Section 6 showing sensitivity and additional analysis. Section 7 concludes.

2. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

2.1 Prior Literature

This paper builds upon three literatures: accounting research linking advertising expenditures to market outcomes; recent marketing research examining differences between digital and traditional advertising; and prior research on the reporting of mergers and acquisitions and related intangible asset recognition.

Prior research in accounting examines advertising, principally in the context of how such expenditures relate to market variables such as equity price. Motivating much of this research is the debate regarding the appropriate accounting treatment of advertising expenditures, with current US GAAP (as well as extant international

reporting standards) generally requiring that such expenditures be expensed as incurred.¹ Earlier research supports this argument, documenting that advertising fails to generate benefits beyond one period (Bublitz and Ettredge 1989); though some research provides contrasting evidence of advertising having multi-period benefits (Hirschey and Weygandt 1985). While advertising costs are expensed under US GAAP, brand assets can be recognized by acquirer firms in the context of mergers and acquisitions (M&A). This creates an inconsistency in the accounting treatment of internally-generated versus externally-acquired brand assets, which raises a number of empirical questions (Hunter et al. 2012). Kallapur and Kwan (2004) investigates the relevance and reliability of recognized brand assets using M&A in the United Kingdom, and finds that recognized brand value is positively associated with acquirer market value of equity, but that this association is attenuated for firms with high contracting incentives.

A number of studies document an overall effect of advertising as increasing firm sales and brand awareness (Meenaghan 1995; Barth et al. 1998). Motivated by the recent evolution of advertising expenditures towards digital advertising channels, more recent marketing research compares the impacts of different advertising channels—often disaggregating advertising into the broad categories of traditional, online display, and paid search. Traditional advertising expenditures (such as television, radio, and print media) are perceived as primarily aimed at brand building, the effectiveness of which is

¹ ASC 720 requires the cost of advertising (except for direct-response advertising) to be expensed as incurred, or at the first time the advertising takes place. Similarly, IAS 38R under International Financial Reporting Standards (IFRS) also requires expenditure on advertising and promotional activities to be expensed when incurred.

measured by brand awareness and consumer preferences (Dragan et al. 2013; De Vries et al. 2017). Digital channels are broadly categorized into online display and paid search. Online display advertising (such as banner ads) reflect some similar characteristics to traditional advertising, in that online display also generates brand interest (Dragan et al. 2013), increases brand search queries (Danaher and Mullarkey 2003), helps with customer retention (Manchanda et al. 2006), and is associated with firm sales (Bayer et al. 2019). In contrast, paid search (such as Google searches) is associated with a higher click-through rate, and translates more directly to sales than online display (Ghose and Yang 2009; Rutz et al. 2011). Studies comparing the effectiveness of different advertising channels document that both traditional and digital advertising contribute to firm performance (Sridhar et al. 2016), yet paid search is superior to traditional in increasing short-term firm sales (Bayer et al. 2019), and online display performs as well as with TV on the longer-term dimension of building brand awareness (Dragan et al. 2013).

Finally, prior research examines the reporting effects of M&A accounting. Under Accounting Standards Codification (ASC) 805, during M&As acquirers must recognize separately from goodwill the identifiable intangible assets—including brand—acquired from the target. The two primary requirements to recognize a separate brand asset are: (i) the asset must lack physical substance, and be expected to generate future economic benefits; and (ii) the asset arises either from contractual or other legal rights, or is separable (FASB 2007). Brand assets are recognized apart from goodwill under either (i) contractual criteria if trademarks/internet domain names are registered with governmental

agencies; or (ii) separable criteria, which FASB believes normally would be the case (FASB 2007). Further, SFAS 141 requires the intangible assets to be recognized at fair value.² Prior literature documents the role of management incentives and measurement errors in intangible asset recognition during M&A. Jones (2011) documents that firms with higher bankruptcy and default risk capitalize intangible assets more aggressively. McInnis and Monsen (2017) documents that M&As with lower measurement uncertainty (proxied by larger acquirer, lower stock return volatility, and experienced acquirer) gain higher post-M&A operating income. However, Wyatt (2005) argues that while managerial incentives exist, the underlying economics of firms drive the first order recognition of intangible assets.

2.2 Hypothesis Development

Firms allocate advertising expenditures over paid search, online display, and traditional advertising. These advertising channels differ in several aspects: one key characteristic is the nature of orientation: this arises from the marketing theory that advertising reaches consumers in different stages of the purchase decision-making process, or the so-called “marketing funnel.”³ In a typical marketing funnel, there are several stages: the top of the funnel is the “awareness” stage, when firms advertise to

² SFAS 141R requires acquired identifiable net assets of the target to be recognized at fair value at acquisition date. This requirement suggests that standard setters believe that fair value measurement of individual identifiable intangible assets is sufficiently reliable to allow separate recognition of those intangible assets at acquisition, and that identifiable intangible assets valuation is independent from the total amount paid for acquisition in a business combination (Halsey and Hopkins 2017).

³ The marketing funnel (or purchase funnel) is a theoretical model often used in marketing literature to describe the customer journey towards the final purchase of a good or service (first introduced by St. Elmo Lewis in 1898).

increase product/service awareness; the middle of the funnel is customer “consideration” (or interest/desire) stage, when firms try to generate interests from consumers through advertisements; and the bottom of the funnel is the “decision” (or “action”) stage, when the actual purchase occurs.

Paid search is a type of digital advertising initiated by users: users search for a keyword on a search engine (e.g., Google, Bing, or Baidu) and obtain relevant ads appearing as sponsored links (typically on the top and the right side of the organic search results). When users click on the sponsored ad, they are taken to the advertiser’s website. This kind of advertising takes place deep in the funnel of consumer purchase journey, with high personalization and a close reach to actual purchase. It also possesses high target ability (Goldfarb and Tucker 2011), and enables firms to track and measure the effectiveness of their ads (Rutz et al. 2011). Consistent with these traits, paid search advertising has been shown to deliver strong contemporaneous sales impact (Bayer et al. 2019) and thus appears more short-term in nature.

Online display is a second major type of digital advertising; it comprises online banner, plain text ads, rich media ads, and online video ads. As another type of digital advertising, online display shares some similar characteristics of paid search, including the ability to track and store consumer data. However, online display is a “push” form of advertising: that is, online display is initiated by firms with an intent of building brand awareness (Sundar and Kim 2005). Hence, online display occurs in the early stage of the consumer purchase decision process, and tries to ‘cast a wide net.’

Traditional advertising reflects all offline advertising outlets: these include

television, magazine, newspaper, radio, and outdoor (such as billboards). Similar to online display, traditional advertising is initiated by firms to create positive brand associations to a wider customer audience, and usually occurs at the initial stage of the consumer purchase funnel. It typically does not allow for tracking or direct links to customer behavior. Thus, the brand-building process by online display and traditional advertising is primarily aimed at influencing the mindset of a customer, who may purchase anytime within a reasonably long horizon (Srinivasan et al. 2010). Therefore, online display and traditional advertising are intended to enhance brand value (Dragan et al. 2013), and thus appear more long-term oriented.

Although advertising of all types could generate immediate sales as well as brand value, paid search advertising appears more sales-driven (on average), whereas online display and traditional advertising reflect more brand-building investments. This suggests that firms primarily accumulate brand value through expenditures in traditional outlets and online display. When firms possessing such brand value are acquired, the accumulated brand can produce ongoing long-term economic benefits for the acquirer (which presumably in part motivates the acquisition).⁴ Accordingly, I expect a significant difference between sales driven advertising and brand building advertising as follows:

⁴ In addition, managers are likely to identify individual intangible assets during M&As (versus report within the category of goodwill) to both highlight the underlying assets, and potentially avoid goodwill impairment losses. The latter have been documented to be associated with manager dismissal (Strong and Meyer 1987). Further, while brand intangible assets can also be impaired, the impairment amount is usually much smaller in magnitude, suggesting lower associated risks relative to goodwill.

H1 Traditional and online display, as compared with paid search, have a higher association with the likelihood of brand asset recognition by acquirers during M&A.

As tension in this expectation, companies disclose little information on advertising expense, possibly due to proprietary costs (Liang 2018). Some firms provide marketing and sales expense, which includes payroll expenditures, while some other firms only disclose a total of SG&A expense on 10K filings. Only a small fraction of firms (29% of Compustat firms) provides annual total advertising expenditures with limited description. Therefore, information on advertising expenditures and the breakdown of money spent on each media outlet are managers' private information; and the limited breakout of advertising expenditures, coupled with limited disclosure of the nature of these expenditures, are consistent with managers viewing this information as having proprietary costs. If similar proprietary costs carry through following the acquisition, the acquirer firm may choose not to separate out an intangible brand asset to avoid revealing proprietary information.⁵

After intangible asset recognition, the acquirer firm must determine several key asset attributes: the value of the brand asset, and its useful life (to determine the amount of recurring amortization, if any). To determine the asset value, the FASB guidelines recommend three approaches to valuing intangible assets: market, income, and cost

⁵ In addition to proprietary costs, prior research questions the effectiveness of building brand value from traditional and online display advertising. Stafford and Faber (2005) argues that traditional advertising comes with a cost additional to the media buy: communication is homogenous and often appealing to the lowest common denominator.

approach. For brand assets, the most common approach is the income approach, specifically the relief from royalty (hereafter “RFR”) method. The RFR method determines an asset value by reference to the hypothetical royalty payments saved through owning the asset, as compared with licensing the asset from a third party. Key inputs in RFR method include revenue forecasts associated with the asset, expected useful life, royalty rate, and discount rate. The valuation process is typically finalized within 6-12 months of the effective date of the acquisition.

Firms investing in traditional advertising and online display should (on average) accumulate brand value. Subsequent to the target firm’s acquisition, any accumulated brand value should affect the acquirer’s future performance, including increased firm sales (Morgan and Rego 2009), higher market value (Kallapur and Kwan 2004), and lower cost of capital (Smith et al. 2010). This suggests that more traditional and online display lead the acquirer firms to estimate a higher future revenue stream associated with the brand and a lower discount rate, using the RFR method.

Moreover, as advertising expenditures represent management investment strategies and are quite sticky (Anderson et al. 2003), firms allocating money in traditional and online display are likely those, which consistently invest in brand building advertisements. Such advertisements affect consumers’ expectations of product or service quality (Kirmani and Wright 1989), leading to strong brand images and high customer loyalty (Yoo et al. 2000). Thus, a strong brand equity is expected to benefit a firm for many years, resulting in a longer expected useful life. Hence, more traditional and online display also are expected to create brand assets with a higher expected useful

life, which increases brand intangible value under RFR method.⁶

Collectively, these insights lead to the following two hypotheses:

H2a Traditional and online display, as compared with paid search, have a higher association with the value of brand asset recognized by acquirers during M&A.

H2b Traditional and online display, as compared with paid search, have a higher association with the expected useful life of brand asset recognized by acquirers during M&A.

However, as the intangible asset valuation process requires many assumptions, there is considerable opportunity for managerial discretion and manipulation. For example, more opportunistic managers may project a higher revenue generated by the brand to derive a higher brand value. In addition, risk-averse managers may assume a higher discount rate, resulting in a lower intangible value. Finally, managers also face incentives to designate the brand as having an indefinite useful life to avoid subsequent amortization expense and consequently no impact on earnings, as well as a higher brand asset value. Collectively, if opportunistic managerial discretion causes the value of the brand to deviate from its true economic value, I expect to observe no association between the examined advertising components and brand value.

As previously argued, the limited disclosure by companies surrounding

⁶ From the external monitor's perspective, the SEC closely monitors the valuation of intangible assets. Specifically, SEC staff often request that registrants discuss in their 10Ks the valuation method and principal assumptions used to determine the fair value of each major class of intangible assets acquired (Ernst & Young 2018). In addition, acquirer firms sometimes hire independent external appraisals to help with intangible asset valuation. Bahadir et al. (2008) interviews executives and valuation experts, providing evidence that in the current accounting environment (i.e., post-Enron and post SOX), the flexibility of manipulation is very limited and firms spend considerable time/resources to get the valuation numbers correct.

advertising creates considerable uncertainty regarding the magnitude of future cash flows arising from these expenditures. This uncertainty can generate information asymmetry between the acquirer firms, who perform extensive due diligence analyses of the potential acquisition target, and the investors. If advertising expenditures on traditional and online display lead to private “brand” benefits for the acquirers, then there would be a higher information asymmetry between acquirer firms and the market for those targets spending more on traditional and online display. This, in turn, should lead to a higher premium acquirer firms are willing to pay for the target firms. This leads to my last hypothesis:

H3 Traditional and online display have a positive association with the premium paid by acquirers during M&A.

However, investors may acquire firms’ advertising information and price it in contemporaneously. Since the premium paid reflects expected synergies over the target firm’s pre-acquisition market value, if investors react contemporaneously to advertising (that is, already incorporate this information into the target’s market price), there would be no association between premium and advertising expenditures (or even a negative association, if managers deem advertising as over-valued by the market).

3. RESEARCH DESIGN

3.1 Advertising Data Source and Sample Collection

To test the differential impact of traditional, online display, and paid search advertising on recognized brand asset value during M&A, I measure advertising using the Kantar dataset. Kantar decomposes a firm’s advertising expenditures into 19 media outlets; thus, it is much more granular as compared with the commonly used Compustat

advertising data.⁷ Kantar obtains this information through systematic monitoring of firms' advertising activities across various channels. It first tracks firms' advertisement occurrences over major media outlets, and then multiplies each advertisement occurrence by its related rate provided by advertising agents to get the dollar amount estimate.⁸ The initial Kantar dataset includes advertising expenditures for around 175,000 firms each year from 2010 to 2016; most are smaller, private firms. I match reported parent firm names from Kantar to those in Compustat.⁹ 2,589 unique firms are identified as publicly traded firms on a US stock exchange. Using Kantar advertising data spanning 2010-2016, I thus obtain a breakdown of firm's advertising expenditures by traditional media (e.g., television and radio), online display (e.g., online banner ads), and paid search (e.g., Google search).

To observe the incidence of brand asset recognition and the amount of acquisition premium, I use the setting of mergers and acquisitions (M&A), in which acquirer firms recognize brand assets as part of the purchase price allocation. Specifically, I obtain all reported M&A in the US from 2011 to 2018 from Bloomberg database;¹⁰ I require both acquirer and target firms to be publicly-traded to allow the collection of necessary data. I

⁷ The 19 media types provided by Kantar include: paid search; internet display; network TV; spot TV; cable TV; Spanish language network TV; syndication; magazines; business-to-business magazines; Sunday magazines; Hispanic magazines; local magazines; national newspapers; local newspapers; Hispanic newspapers; network radio; national spot radio; local radio; and outdoor activities. Note that mobile ads and social media ads are not included in the dataset used in this analysis (though are available from Kantar).

⁸ For more details, please see the Ad\$pendor manual (Kantar Media, 2011).

⁹ The fuzzy matching algorithm in SAS is employed to find the matched Kantar parent firm name from Compustat. Then I manually check to ensure match accuracy.

¹⁰ Bloomberg data is used because it gives an initially larger number of M&A deals than SDC Platinum.

then merge these M&As with the above Kantar advertising data, resulting in 264 deals with observable target advertising in pre-M&A periods. For these 264 acquisitions, I manually collect the purchase price allocation information from the acquirer's SEC filings (through either the 10K, 10Q, 8K, or S4 on EDGAR), and merge this data with necessary information from Compustat and CRSP. This leads to a final sample of 210 deal observations.

3.2 Advertising Variables

The primary independent variables are target firms' average advertising expenditures prior to acquisition, subject to Kantar advertising data availability. I use the average of the deflated advertising over the two years preceding the acquisition. Use of two years builds on the intuition of brand-building as a longer-term investment in advertising expenditures, while not requiring too long a time series (and thus significantly reducing the sample size). I use two alternative deflators to account for heterogeneity (firm size): target firm sales and target firm total assets, both measured as of the beginning of the fiscal year preceding acquisition.¹¹ Using the Kantar data, I aggregate the advertising expenditures into the following three components, representing independent variables of interest:

Traditional = target firm's average scaled traditional advertising in the two years preceding acquisition

¹¹ While the correlations of the variables using the two alternative scalars are very high, using each ensures the results are not affected by the choice of sales (which may be disproportionately affected by *PaidSearch*) or assets (which may be disproportionately affected by *Traditional* or *OnlineDisplay*).

OnlineDisplay = target firm's average scaled online display advertising in the two years preceding acquisition

PaidSearch = target firm's average scaled paid search advertising in the two years preceding acquisition.

3.3 The Impact of Advertising Expenditure Type of Brand Asset Recognition

To test H1 (whether target firm spending on traditional and online display advertising has a higher impact on the recognition of brand assets relative to paid search), I use the following logistic model:

$$\begin{aligned} \text{BrandRecognition}_{i,t+n} = & \alpha_0 + \beta_1 \text{Traditional}_{i,t} + \beta_2 \text{OnlineDisplay}_{i,t} + \beta_3 \text{PaidSearch}_{i,t} + \\ & \beta_4 \text{MAStrategy}_{i,t} + \beta_5 \text{TargetFirmAge}_{i,t} + \beta_6 \text{TargetIndGrowth}_{i,t} \\ & + \beta_7 \text{TargetSalesGrowth}_{i,t} + \beta_8 \text{TargetMktShare}_{i,t} + \\ & \beta_9 \text{TargetIndCompetition}_{i,t} + \beta_{10} \text{TargetIndDemandRisk}_{i,t} + \\ & \beta_{11} \text{AcqBrandMention}_{i,t} + \beta_{12} \text{AcqLeverage}_{i,t} + \\ & \beta_{13} \text{AcqFinancing}_{i,t} + \beta_{14} \text{AcqSize}_{i,t} + \text{Industry FE} + \text{Year FE} + \\ & \varepsilon_{i,t} \end{aligned} \quad (1)$$

The dependent variable is *BrandRecognition*; it is measured as an indicator variable equal to one if the acquirer firm recognizes a separate brand intangible asset on the final purchase price allocation from acquisition *i* in year *t+n*, and zero otherwise.

The main variables of interest are the three measures of advertising expenditures: *Traditional*, *OnlineDisplay*, and *PaidSearch*. Under H1, if traditional and online display advertising have a bigger impact on brand development (and thus recognition of a brand upon acquisition), then I predict positive coefficients on *Traditional* (β_1) and *OnlineDisplay* (β_2) that are more positive than that on *PaidSearch* (β_3).

Following Bahadir et al. (2008), I control for synergy between target and acquirer (*MAStrategy*), target industry sales growth (*TargetIndGrowth*), target three-year sales growth (*TargetSalesGrowth*), target market share (*TargetMktShare*), target industry concentration level (*TargetIndCompetition*), and target industry sales volatility (*TargetIndDemandRisk*). As firms operating in the same industry, having higher industry sales growth, higher individual firm growth, larger market share, higher concentration, and less industry sales volatility are expected to have higher cash flow expectations from the acquired brands, the predicted coefficient signs are positive for all variables.

Following Muller (1999), I control for firm's incentives to over- or under-value intangible assets by including acquirer's leverage and financing considerations. *AcqLeverage* is the acquirer's long-term debt deflated by total assets; the predicted sign is positive, as firms with higher leverage have incentives to record intangible assets to loosen debt covenant restrictions and thereby increase the firms' access to new debt (Wyatt 2005). *AcqSize* is acquirer's logged total assets; this proxies for size effects associated with the recognition of brand assets. *AcqFinancing* is defined as the acquirer's short-term debt scaled by total assets; the predicted sign is positive since firms in need of short-term capital are more likely to disclose discretionary information to reduce the information asymmetry between managers and potential capital providers. I also control for the extent to which the acquirer firm appears to emphasize brand, as measured by the log of the number of brand related words mentioned in the acquirer 10K prior to the M&A announcement (*AcqBrandMention*). I also include target firm age, as proxied by the number of years the target firm has data in Compustat (*TargetFirmAge*). The

predicted coefficients for both *AcqBrandMention* and *TargetFirmAge* are positive, as higher acquirer mentions of brand and a longer existence of the target suggest a higher likelihood of brand recognition. Finally, I include industry (1-digit SIC) and year fixed effects to control for differences in brand across industries and any time-series trend in intangible asset recognitions.

3.4 The Impact of Advertising Expenditure Type on Brand Asset Valuation and Amortization

Next, I assess two key characteristics of recognized brand assets: the valuation amount, and the amortization of the underlying asset. To control for systematic differences that may exist between firms that recognize brand assets versus those that do not, I use the Heckman (1979) two-stage procedure. In the first stage, I estimate a probit model with an indicator dependent variable equal to one if the acquirer recognizes a brand, and zero otherwise. Following Bahadir et al. (2008), I estimate Equation (2) below, computing the Mills lambda ratio and including it in subsequent analysis to control for systematic differences between firms with and without brand asset recognition.

$$\begin{aligned}
 BrandRecognition_{i,t+n} = & \alpha_0 + \beta_1 \mathbf{Traditional}_{i,t} + \beta_2 \mathbf{OnlineDisplay}_{i,t} + \beta_3 \mathbf{PaidSearch}_{i,t} + \\
 & \beta_4 \mathbf{AcqLeverage}_{i,t} + \beta_5 \mathbf{AcqSize}_{i,t} + \beta_6 \mathbf{AcqFinancing}_{i,t} + \\
 & \beta_7 \mathbf{AcqTechnology}_{i,t} + \text{Industry FE} + \text{Year FE} + \varepsilon_{i,t}
 \end{aligned}
 \tag{2}$$

To test H2a (whether target firm's traditional and online display have a stronger association with brand asset valuation as compared with paid search advertising) I use the

following model:

$$\begin{aligned}
 BrandValue_{i,t+n} = & \alpha_0 + \beta_1 \mathbf{Traditional}_{i,t} + \beta_2 \mathbf{OnlineDisplay}_{i,t} + \beta_3 \mathbf{PaidSearch}_{i,t} + \\
 & \beta_4 \mathbf{MAStrategy}_{i,t} + \beta_5 \mathbf{TargetFirmage}_{i,t} + \beta_6 \mathbf{TargetIndGrowth}_{i,t} + \\
 & \beta_7 \mathbf{TargetSalesGrowth}_{i,t} + \beta_8 \mathbf{TargetMktShare}_{i,t} + \\
 & \beta_9 \mathbf{TargetIndCompetition}_{i,t} + \beta_{10} \mathbf{TargetIndDemandRisk}_{i,t} + \\
 & \beta_{11} \mathbf{AcqBrandMention}_{i,t} + \beta_{12} \mathbf{AcqLeverage}_{i,t} + \beta_{13} \mathbf{AcqFinancing}_{i,t} + \\
 & \beta_{14} \mathbf{AcqSize}_{i,t} + \beta_{15} \mathbf{IMRBrand}_{i,t} + \mathbf{Industry FE} + \mathbf{Year FE} + \varepsilon_{i,t}
 \end{aligned}
 \tag{3}$$

The dependent variable is *BrandValue*, the log of the recognized brand intangible asset value, and zero if firm does not recognize a brand asset. I use a tobit model for this estimation since the dependent variable is censored. That is, in the final purchase price allocation, firms either report a positive amount for brand value, or no recognition in which case it is treated as a 0 brand value; thus, *BrandValue* is left-censored.

Following Bahadir et al. (2008), I control for synergy between target and acquirer (*MAStrategy*), target industry sales growth (*TargetIndGrowth*), target three-year sales growth (*TargetSalesGrowth*), target market share (*TargetMktShare*), target industry concentration level (*TargetIndCompetition*), and target industry sales volatility (*TargetIndDemandRisk*), as well as for acquirer short-term and long-term financing need (*AcqFinancing* and *AcqLeverage*), and acquirer total assets (*AcqSize*). I also control for the extent to which acquirer mentions brand in annual report (*AcqBrandMention*) and the age of target firm (*TargetFirmage*). All variables are as defined above, with the same predicted signs. I also include the inverse mills ratio (*IMR*) derived from Equation (2) to

control for potential self-selection. Finally, I include SIC industry and year fixed effects to control for differences in brand across industries and any time-series trend in intangible asset recognitions.

The main variables of interest remain: *Traditional*, *OnlineDisplay*, and *PaidSearch*. Consistent with H2a, if traditional and online display advertising have a bigger impact on the amount of brand asset that is recognized upon acquisition, then I predict positive coefficients on *Traditional* (β_1) and *OnlineDisplay* (β_2) that are more positive than that on *PaidSearch* (β_3).

Finally, to test H2b (whether target firm's traditional and online display have a stronger association with brand expected useful life as compared with paid search advertising), I use the following models:

$$\begin{aligned}
 Amort_{i,t+n} = & \alpha_0 + \beta_1 \mathbf{Traditional}_{i,t} + \beta_2 \mathbf{OnlineDisplay}_{i,t} + \beta_3 \mathbf{PaidSearch}_{i,t} + \\
 & \beta_4 \mathbf{MAStrategy}_{i,t} + \beta_5 \mathbf{TargetFirmAge}_{i,t} + \beta_6 \mathbf{TargetIndGrowth}_{i,t} + \\
 & \beta_7 \mathbf{TargetSalesGrowth}_{i,t} + \beta_8 \mathbf{TargetMktShare}_{i,t} + \\
 & \beta_9 \mathbf{TargetIndCompetition}_{i,t} + \beta_{10} \mathbf{TargetIndDemandRisk}_{i,t} + \\
 & \beta_{11} \mathbf{AcqBrandMention}_{i,t} + \beta_{12} \mathbf{AcqLeverage}_{i,t} + \beta_{13} \mathbf{AcqFinancing}_{i,t} + \\
 & \beta_{14} \mathbf{AcqSize}_{i,t} + \beta_{15} \mathbf{IMRBrand}_{i,t} + \mathbf{Industry FE} + \mathbf{Year FE} + \epsilon_{i,t}
 \end{aligned}
 \tag{4}$$

I measure the dependent variable, *Amort*, in two ways. First, *AmortIndef* is an indicator variable equal to one if the acquirer firm estimates an indefinite useful life of brand asset, and zero if no brand asset is recognized or the asset possesses a definite useful life. To obtain estimates from the probability of indefinite useful life on brand asset, I use a logistic regression. Second, the dependent variable is *AmortLife*, defined as

the number of years of expected useful life for brand intangible asset; this is set equal to 0 if no recognized brand and equal to 30 if indefinite.¹² Since indefinite useful life is treated as 30 years and no recognized brand is treated as 0, *AmortLife* is left- and right-censored and a tobit model is used. I include the same control variables (with the same predicted signs) as in Equation (3).

Under H2b, if traditional and online display advertising have a bigger effect on future economic benefits and useful life, then I predict positive coefficients on *Traditional* (β_1) and *OnlineDisplay* (β_2) that are more positive than that on *PaidSearch* (β_3).

3.5 The Impact of Advertising Expenditure Type on Acquisition Premium

To test H3 (whether target firm spending on traditional and online display advertising is positively associated with acquisition premium acquirer firms pay), I use the following OLS model:

$$\begin{aligned}
 Premium_{i,t+n} = & \alpha_0 + \beta_1 \mathbf{Traditional}_{i,t} + \beta_2 \mathbf{OnlineDisplay}_{i,t} + \beta_3 \mathbf{PaidSearch}_{i,t} + \\
 & \beta_4 \mathbf{TargetAcqSize}_{i,t} + \beta_5 \mathbf{TargetBTM}_{i,t} + \beta_6 \mathbf{TargetSize}_{i,t} + \\
 & \beta_7 \mathbf{TargetLev}_{i,t} + \beta_8 \mathbf{TargetROE}_{i,t} + \beta_9 \mathbf{CompeteBid}_{i,t} + \beta_{10} \mathbf{MAStrategy}_{i,t} \\
 & + \beta_{11} \mathbf{StockPmt}_{i,t} + \beta_{12} \mathbf{Tender}_{i,t} + \mathbf{Industry FE} + \mathbf{Year FE} + \varepsilon_{i,t}
 \end{aligned}
 \tag{5}$$

The dependent variable, *Premium*, is measured in two ways. First, *Premium_Ann* is M&A announcement date acquisition premium, deflated by the target firm market

¹² Results are robust if I alternatively define indefinite with a value of 50 years.

value. Second, *Premium_1Mon* is one-month prior to M&A announcement date acquisition premium, deflated by target firm market value.

Following Laamanen (2007), I control for target firm characteristics and deal characteristics. *TargetAcqSize* is the target total assets divided by acquirer total assets. A low target to acquirer size ratio indicates an acquisition of small target by large acquirer, which is likely to generate greater improvement than a combination of similar size firms, resulting in a high premium (Bhagat et al. 2005). *TargetBTM* is the target firm book to market ratio: a low book to market ratio suggests that investors already incorporate growth opportunities into target stock price, thus the managers are likely to pay less premium. I also include *TargetSize*, the log of target firm revenue; *TargetLev*, the target firm leverage; and *TargetROE*, the target firm return on equity. I also control for deal characteristics using four indicator variables: *CompeteBid*, equal to one if there are competing bids, zero otherwise; *MAStrategy*, equal to one if the acquirer firm and target firm operate in the same two-digit SIC industry, zero otherwise; *StockPmt*, equal to one if the deal is paid either partially or fully by stock, zero otherwise; and *Tender*, equal to one if the deal is a tender offer, zero otherwise. If the deal has a competing bid, is paid by all cash, or is a tender offer, then the acquirers are more likely to pay a high premium. Industry and year fixed effects are also included to control for differences in acquisition premiums paid across industries and any time-series trend in M&A purchase price.

Under H3, if traditional and online display lead to higher premiums, then I predict positive coefficients on *Traditional* (β_1) and *OnlineDisplay* (β_2).

4. SAMPLE DESCRIPTIVE STATISTICS

Table 1 Panel A presents the sample selection. The population is all completed M&As for which the targets have pre-M&A Kantar data, and both targets and acquirers are US public firms during the period from 2011–2018. This yields 264 acquisitions. Then I manually collect purchase price allocation and valuation process information from the acquirers' SEC filings; 19 observations lacking available purchase price allocation disclosures are dropped.¹³ I remove another 35 observations with missing variable values, resulting in a final sample of 210 M&As. Panel B reports the sample distribution by acquirer choice of brand recognition and brand amortization. Of the 210 transactions, target brand intangible assets are recognized in 105 deals. Among those deals for which the brand asset's amortization schedules are disclosed (102 out of 105), 20% have an expected useful life of less than or equal to five years, 22% of 6–10 years, 16% of 11–38 years, and 39% recognize an indefinite useful life. Panel C shows the distribution by target and acquirer industry. Of the 210 deals, 32% (27%) [37%-45%] of firms (target or acquirer) operate in the manufacturing (financial) [service] industry.

<Table 1>

Table 2 reports advertising and brand statistics by year for M&A sample firms (Panel A) and advertising statistics for whole Kantar sample public firms (Panel B). Of the 210 deals having Kantar target advertising data, only half (113) firms report total

¹³ This is because (i) the acquirer reports only an aggregated purchase price allocation from multiple M&As, (ii) only the total intangible asset value without specific breakdowns is presented in the SEC filings, or (iii) the deal is a recent M&A for which the purchase price allocation is not yet available.

advertising expenditures in Compustat, with an average of \$46.3 million. The advertising (in Compustat and Kantar) amount is unusually high in year 2015, because Time Warner, who reports \$2586 million advertising expense in Compustat and spends \$10, \$20, and \$1020 million in *PaidSearch*, *OnlineDisplay*, and *Traditional*, is acquired by AT&T in year 2016.¹⁴ Moving to brand characteristics, the percentage of deals with recognized brand assets ranges from 23% to 86%. The average useful life for the brand asset ranges from 5 to 15 years (treating indefinite as 30 years, and no recognized brand as 0 year). Panel B shows that on average less than half (around 800 out of 1,800) of Kantar firms disclose advertising expenditures in Compustat. For firms that have advertising data in Kantar and report non-missing advertising expense in Compustat, their average reported advertising expenditure is around \$90 million per year. The average total advertising media expenditure of public firms tracked by Kantar is around \$30 million per year.¹⁵ For the whole Kantar sample, only *PaidSearch* has an increasing trend while *OnlineDisplay* and *Traditional* remains relatively same over time.

<Table 2>

Table 3 presents some sample M&A firms' advertising and brand characteristics. Brand intangible asset recognition occurs in M&A deals across a wide range of industries (tobacco, technology, pharmaceuticals, retail etc.). There is also substantial

¹⁴ Main results are not affected by excluding this observation.

¹⁵ The difference between Kantar and Compustat advertising expenditure likely reflects several reasons: (i) Compustat uses firm's self-reported advertising expense, which may have varying definitions by different firms—for example, some firms include sales and marketing personnel wage in advertising expense; and (ii) the Kantar database used in these analyses does not include mobile ads or social media ads.

heterogeneity in the recognized brand value as well as amortization treatment of the brand.

<Table 3>

Table 4 reports the descriptive statistics. On average sample target firms spend 0.44% of total sales on media advertising, broken down as 0.28% (0.093%) [0.064%] on traditional (online display) [paid search] advertising; similar percentages occur using total assets as the scalar. Summary statistics for the other control variables are comparable to prior research (e.g., Bahadir et al. 2008).

<Table 4>

The valuation process information, hand-collected from SEC filings around each acquisition, also is presented in Table 4. *ValuationAdj_AbsAmt* is the absolute difference between the initially assigned brand value and the final value, deflated by final brand value: it averages 40% of final value, indicating significant changes in brand value during the valuation process. *ValuationAdj_Days* is the number of days after M&A completion date when the acquirer first discloses the initial value of brand intangible assets: the median value is 35 days.¹⁶ *Appraisal* is an indicator variable equal to one if acquirer firms disclose that they hire independent valuation experts in helping with the intangible asset valuation process, and zero otherwise: only 18% of firms disclose using a valuation expert. *Valuation_Table* is an indicator variable equal to one if the acquirer firm discloses each category of intangible assets in a table, and zero if only in text: 81% use

¹⁶ A negative number indicates that the acquirer firm discloses an estimated brand intangible asset number before completing the acquisition.

tabular presentation. *Valuation_Disc* is a categorical variable equal to: 1 if the acquirer firm discloses neither specific method nor major assumptions in valuing brand asset; 2 if disclosing a specific method (e.g., RFR) in valuing brand asset; 3 if disclosing major assumptions when valuing the brand; and 4 if disclosing both the specific method and major assumptions when doing brand asset valuation. 25% of the sample firms do not disclose the valuation method or assumptions used during the valuation process. Collectively, these descriptive data indicate substantial variation in management reporting choices surrounding the brand intangible asset and its valuation.

Table 5 presents the correlation matrix. *Traditional* and *OnlineDisplay* are positively correlated with *BrandRecognition*, *BrandValue*, and *AmortIndef*, consistent with H1 and H2a. There is also a positive correlation between *Traditional* and *AmortLife*, consistent with H2b. There is no significant correlation between advertising variables and *Premium* variables. Correlations between all variables suggest no substantial multi-collinearity concerns; additional untabulated tests (using variance inflation factors) similarly suggest no multi-collinearity.

<Table 5>

5. EMPIRICAL RESULTS

5.1 The Impact of Advertising Expenditure Type on Brand Recognition

Table 6 presents the logistic regression results of Equation (1). Column (1) reports the results using disaggregated advertising deflated by target firm sales. The coefficients of *Traditional* (0.12; p -value = 0.06) and *OnlineDisplay* (0.18; p -value =

0.00) are significantly positive as expected. To provide the economic effect; an increase of 0.1% of advertising on *Traditional (OnlineDisplay)* as a percentage of sales lead to an increased probability of 12% (18%) on brand recognition. The coefficient on *PaidSearch* is negative and not significant (-0.11 ; p -value = 0.30).¹⁷ The bottom of the table presents tests of coefficients; the difference between the coefficients on *Traditional* and *PaidSearch*, and on *OnlineDisplay* and *PaidSearch*, are both significantly positive as predicted (p -value = 0.048 and 0.029, respectively). Column (2) presents the results, now summing traditional and online display deflated by target firm sales. Similar to the above results, the coefficient of *Traditional + OnlineDisplay* is significantly positive (0.28; p -value = 0.02), that on *PaidSearch* is negative (-0.09 ; p -value = 0.38), and the difference is significantly positive as predicted (p -value = 0.033). These results provide support for H1.

Column (3) redefines the *Traditional*, *OnlineDisplay*, and *PaidSearch* experimental variables by using an alternative scalar of total assets. Results are similar to those reported above. The coefficients of *Traditional* (0.26; p -value = 0.01), *OnlineDisplay* (0.22; p -value = 0.04), and *Traditional+OnlineDisplay* (0.47; p -value = 0.03) remain significantly positive. The coefficient on *PaidSearch* remains negative (-0.10 ; p -value = 0.21). Tests of coefficients reveal significant differences between *Traditional* and *PaidSearch* (p -value = 0.038), *OnlineDisplay* and *PaidSearch* (p -value = 0.032), and *Traditional + OnlineDisplay* and *PaidSearch* (p -value = 0.024).

¹⁷ *PaidSearch* is used primarily for generating immediate sales, which may hurt future sales and thus negatively affect brand recognition.

Turning to the control variables, *TargetIndCompetition*, *MAStrategy*, and *TargetFirmage* is positively associated with the likelihood of brand asset recognition (p -value < 0.1 across all columns), suggesting that brand asset is perceived to be more important in more competitive industries, in synergetic M&A deals, and for older target firms. The remaining control variables are generally insignificant. Collectively, the results in Table 6 provide strong evidence that the likelihood of recognizing a brand intangible asset upon acquisition is higher for those target firms having traditional and online display advertising, as compared with paid search advertising; this provides evidence consistent with H1.

<Table 6>

5.2 The Impact of Advertising Expenditure Type on Brand Asset Valuation and Amortization

Table 7 presents the Equation (2) results examining the effects of advertising expenditures on brand asset valuation (i.e., H2a). Focusing on Columns (1) and (2), where *BrandValue* is defined using advertising variables deflated by target sales, the coefficient on *Traditional* is significantly positive as expected (0.04, p -value = 0.04), as is that for *OnlineDisplay* (0.07, p -value = 0.09). The coefficient on *Traditional + OnlineDisplay* is also significant (0.08, p -value = 0.00). To provide the economic effect; an increase of 0.1% of advertising on *Traditional (OnlineDisplay)* as a percentage of sales lead to an increased valuation of \$2.5 million (\$5 million) on brand . The coefficients on *PaidSearch* are not significant (-0.02 and 0.01, p -value = 0.72 and 0.99, respectively). The differences tabulated at the bottom of the table reveal the coefficients

on *Traditional* (p -value = 0.074), *OnlineDisplay* (p -value = 0.093), and *Traditional + OnlineDisplay* (p -value = 0.048) to all be larger than that on *PaidSearch* as expected.

This supports H2a: target firms' spending on traditional and online display advertising have a more positive effect on the intangible brand value recognized by the acquirer firms relative to paid search advertising. These effects are further supported in Column (3) and (4), in which advertising deflated by target total assets are adopted as independent variables.

Of the control variables, the target firm's market share (*TargetMktShare*), industry competition (*TargetIndCompetition*), importance of brand in acquirer (*AcqBrandMention*), and acquirer size (*AcqSize*) are consistently positive and significant. If the target firm possesses a higher market share among competitors or operates in a more competitive industry, this is suggestive of the target firm having a strong brand, which would lead upon acquisition to recognition of a higher brand value. If the acquirer firm values and mentions more brand or is larger, it has a higher tendency to value target firm's brand asset. The remaining control variables are either insignificant or not consistently significant.

<Table 7>

Table 8 presents results from Equation (4) examining the effects of advertising expenditures on brand amortization (i.e., H2b). Panels A and B present evidence using *AmortIndef* and *AmortLife* as dependent variables, respectively. Results in Columns (1), (2) and (5), (6) use advertising variables scaled by target sales; those in Columns (3), (4) and (7), (8) deflate by target total assets. *Traditional* in general exhibits a positive and

significant association with both the likelihood of indefinite amortization (0.06 and 0.13, p -value = 0.05 and 0.09), as well as the number of years in expected useful life (0.71 and 0.51, p -value = 0.03 and 0.08). More importantly, the bottom of the table confirms that the coefficient on *Traditional* is more positive relative to that on *PaidSearch* in all Columns (p -value = 0.081, 0.095, 0.058, and 0.073). Turning to *OnlineDisplay*, the coefficient is significant in Column (1), (3), and (7), and is insignificant in either Column (5). The coefficients on *PaidSearch* are insignificant in all columns (-0.14 , p -value = 0.28; -0.04 , p -value = 0.60; -0.48 , p -value = 0.31; -0.19 , p -value = 0.34); this suggests a negative association between paid search advertising and the useful life of brand assets. More importantly, the coefficient on *OnlineDisplay* is significantly more positive relative to *PaidSearch* for either indefinite amortization (p -value = 0.092 and 0.077) or amortization life (p -value = 0.146 and 0.085). The coefficient on *Traditional* + *OnlineDisplay* is also significant (0.07, p -value = 0.02; 0.04, p -value = 0.02; 0.72, p -value = 0.02; 0.62, p -value = 0.02;), and is more positive than the coefficients of *PaidSearch* for indefinite amortization (p -value = 0.078 and 0.071). These provide support for H2b.

Among the control variables importance of brand for acquirer (*AcqBrandMention*), and age of target (*TargetFirmAge*) are consistently positive and significant. A target with older age is likely cumulate advertising and reputation overtime, suggestive of a strong brand, which would not only lead to recognition of a higher brand value, but also a longer expected useful life. The more the acquirer value brand, the higher expected useful life of brand. The remaining control variables are

either insignificant or not consistently significant.

<Table 8>

Overall, the results of Tables 7 and 8 support H2a and H2b. In particular, target firms' traditional and online display advertising appear to have a stronger mapping into both the brand value that is recognized by the acquirer, as well as the likelihood of reporting an indefinite brand life, as well as the number of years of useful life, as compared to paid search advertising.

5.3 The Impact of Advertising Expenditure Type on Acquisition Premium

Table 9 presents results of Equation (5) examining the impact of advertising expenditures on deal premium (i.e., H3). Panels A and B present evidence using *Premium_Ann* and *Premium_1Mon* as dependent variables, respectively. Results in Columns (1) and (3) use advertising variables scaled by target sales; and those in Columns (2) and (4) use advertising variables scaled by target total assets. The coefficient on *Traditional* is consistently significantly positive with both acquisition date premium (0.44, p -value = 0.00 and 0.51, p -value = 0.00) and that one-month before the acquisition date (0.48, p -value = 0.00 and 0.57, p -value = 0.00). Interestingly, both digital advertising type of *OnlineDisplay* and *PaidSearch* appear negatively associated with the acquisition premium. One possible explanation is that investors already incorporate such information into their contemporaneous stock price, so managers would pay less premium for online display.¹⁸ Another is that the primary benefits of long-term

¹⁸ Untabulated results show that sample target firm 12-month buy and hold abnormal return is positively and significantly associated with change in paid search and change in online display

brand-building accumulate through traditional advertising channels and not through digital advertising channels; and that these benefits are revealed to acquirers in their due diligence, leading to higher acquisition premiums.

Turning to the control variables, *StockPmt* is negatively associated with premium, consistent with stock payment regarded as a negative signal of the quality of the acquirer stock (Myers and Majluf 1984). Moreover, *Tender* is significantly positive, suggesting target management's willingness to be acquired resulting in a higher premium. The remaining control variables are insignificant.

<Table 9>

6. SENSITIVITY AND ADDITIONAL ANALYSES

6.1 Sensitivity Analyses

In this section, I examine the robustness of my findings. First, as *BrandValue* is the log value of recognized brand asset, the significant association between *BrandValue* and advertising expenditures may reflect firm size (although both firm size and market share are included as control variables). Accordingly, I use two alternative definitions of brand value: (a) recognized brand value deflated by target firm total assets, and (b) recognized brand value deflated by total purchase price consideration for the M&A. The inferences are unchanged using these alternative dependent variables.

Second, although the Kantar data is employed by many prior studies (e.g., Reuter and Zitzewitz 2006; Clark et al. 2009), there may be concerns about measurement error in

before M&A announcement, suggesting the contemporaneous incorporation of paid search and online display by investors.

the media advertising expenditures. Accordingly, I redefine the measurement window for the advertising data (measured as the average of the two-years preceding the acquisition date) to alternatively be: (i) the average of all available years; (ii) the average of the three years preceding the acquisition date; and (iii) only the most recent one year preceding the acquisition data. The results are robust across all of to these alternative experimental variable definitions.

Third, 27% of my sample observations are M&As in the financial industry (SIC 6000-6900). As the asset base for such firms differ significantly from those of non-financial firms, and because the incentives to recognize intangible assets such as brands may differ (due to banking regulatory reporting requirements that typically exclude intangible assets from key ratio calculations), I also test my results excluding sample firms in the financial industry. I obtain qualitatively similar results.

Finally, I include additional control variables for target firm characteristics, including target total advertising expenditure reported in Compustat. I also adopt alternative definitions of firm size such as total sales and number of employees, and alternative industry fixed effects of Fama-French 10 industry fixed effects. All the inferences remain unchanged using these alternative model specifications and variable definitions.

6.2 Endogeneity

In this section, I address potential endogeneity within my setting. First, since target firms are not randomly assigned, there can lead to selection bias. For example, target firms may have advertising that is more effective in creating intangible brand

assets and increasing brand asset value relative to similar non-target firms (Capron and Shen 2007). Accordingly, I conduct an additional Heckman (1979) two-step estimation procedure. First, I estimate a selection model of the target: for each target firm, I match a firm from the same 4-digit SIC industry and of similar size (Total Assets) and advertising expenditures. The target and matched firms are then pooled in a first-stage model of the likelihood of acquisition; the second stage of brand asset recognition then includes the inverse Mills ratio ($IMRT_{gt}$). The coefficient for $IMRT_{gt}$ in the brand recognition model therefore captures systematic differences between target and non-target firms on brand recognition. Moreover, the main analyses of brand valuation (Table 7) use a Heckman selection model to control for systematic differences between firms with and without recognized brand intangibles. To address issues in both target selection and brand recognition and allowing the error terms across the two selection equations to be correlated, a three-stage least square procedure is adopted (Zellner 1962; Wooldridge 2010). Table 10 Columns (1) to (4) presents the results controlling for target sample selection. The coefficient of $IMRT_{gt}$ is insignificant across all the equations, providing some assurance of no selection bias from target firms. The coefficients of *OnlineDisplay* and *Traditional*, controlling for target sample selection and brand recognition, remain significantly higher than those of *PaidSearch*, consistent with the main results in Table 6 and Table 7.

<Table 10>

Second, prior research suggests potential endogeneity in advertising response models when the advertising variables correlate with the error terms. In particular,

allocation of advertising is not random, suggesting a selection bias can occur when managers choose media channels which appeal more to the targeted group (Danaher and Dagger 2013). For example, customers searching for a related keyword makes the customers more likely to be exposed to a search ad and more likely to purchase online (Blake et al. 2015). If customers exposed to online display and traditional advertising are more likely to value brand image than customers exposed to paid search, there exists a correlated omitted variable concern.¹⁹ Accordingly, I create instrumental variables (IVs) for these media, and use the predicted values in Equations (2) and (3). Previous studies use firms' advertising from non-competing firms as instrumental variables (e.g., Ataman et al. 2010, Rinallo and Basuroy 2009, Dinner et al. 2014): I follow this approach, and use as IVs the advertising expenditures (traditional, online display, and paid search expenses) by similar but non-competing firms. The corresponding logic is that shocks creating exogenous variations in advertising variables in one market will cause similar exogenous variations in the focal market. Therefore, advertising from non-competing (but not too dissimilar) firms are subject to similar exogeneous shocks that sample target firms face but are unlikely to affect cumulative brand value of the focal firms and thus will not be correlated with the error terms. The advertising expenditures of the firms having the following traits are used: (1) the firm must be in the same 2-digit SIC but

¹⁹ Another endogeneity concern related to advertising is the demand shocks bias when managers anticipate high demand from consumers at certain time periods (e.g., Thanksgiving) and adjust their advertising accordingly (Petrin and Train 2010). Since brand intangibles represent the cumulative long-term effect of advertising, they are unlikely to be affected by temporal demand shocks. In addition, untabulated results show consistent advertising expenditures by sample targets before M&A announcement using monthly data. Therefore, the demand shock bias is unlikely to exist in this study.

different 4-digit SIC with the target firm; (2) the firm has available advertising data from Kantar; and (3) the firm is of similar size as target firms in the sample. I apply the Durbin-Wu-Hausman test; results fail to reject the null hypothesis that OLS estimates of the structural equations are consistent (Rinallo and Suman 2009, Wooldridge 2002).^{20 21}

6.3 Additional Analyses – Consequences of Brand Assets

Finally, I conduct two preliminary analyses to assess whether the recognition of brand intangible assets by managers of acquiring firms is consistent with this representing a long-term underlying economic asset. First, I conduct a market test, and investigate the market reaction to acquirer firms' recognized brand value around the date of the first public filings in which acquirers recognize brand assets. Kallapur and Kwan (2004) finds a positive average stock market reaction to recognized brand amount, on a small sample of 24 M&As in the UK. I reexamine this issue using my US sample ($N=100$) and a shorter-window of CAR (3-day) to better isolate the observed market response.

I collect the brand asset amount disclosed in the first public filing after the M&A announcement by manually reading all public filings (including 8K, S4, 10Q, 10K) for the acquirer firm. Cumulative abnormal return (*CAR*) is calculated using the 3-day (-1, +1) value-weighted market-adjusted stock return of the acquirer firm, centered around the filing date of the first disclosure. Results are reported in Table 11 Panel A. Columns (1),

²⁰ $p = 0.785, 0.238, \text{ and } 0.339$ in the brand recognition equation and $p = 0.220, 0.240, \text{ and } 0.330$ in the brand value equation for Traditional, OnlineDisplay, and PaidSearch, respectively.

²¹ In general, failure to reject the null implies that there is no need for structural modelling, but failure to reject the null may or may not imply the presence of endogeneity. It is possible that endogeneity exists but the Hausman test fails to find it due to issues such as model specification, variable measurement, or sample size power.

(2), and (3) show the brand amount in log value, deflated by market value of equity, and deflated by deal purchase price, respectively. Results reveal that *Brand* is positively associated with 3-day CAR across all three brand measures, suggesting positive investor reaction to recognized brand amount.

<Table 11>

Second, I examine whether acquired brand asset exhibit *ex post* future benefits. To proxy for future benefits associated with brand assets, I use future revenues. My choice of revenue is consistent with the notion that brand assets lead to future sales generation.²² Thus, I estimate the following OLS model:

$$\begin{aligned}
 AcqSales_{i,t+n} = & \alpha_0 + \beta_1 \mathbf{BrandValue}_{i,t} + \beta_2 AcqLeverage_{i,t} + \beta_3 AcqSize_{i,t} + \\
 & \beta_4 AcqFinancing_{i,t} + \beta_5 AcqIndGrowth_{i,t} + \\
 & \beta_6 AcqIndCompetition_{i,t} + \beta_7 AcqIndDemandRisk_{i,t} + \text{Year FE} + \\
 & \varepsilon_{i,t}
 \end{aligned}
 \tag{6}$$

The dependent variable is the log of acquirer firms' total revenue one, two, or three years after the completion date of the M&A. The main variable of interest is *BrandValue*, which is the log value of intangible brand asset, or equal to zero if no brand asset is recognized. If the brand intangible asset produces long-term benefits for acquirer firm, as suggested by the capitalization and recognition of the brand asset, then I predict a positive association between *BrandValue* and the acquirer firm future *Sales*. Following Bayer et al. (2019), I control for acquirer leverage (*AcqLeverage*), acquirer size

²² Other measures, such as bottom-line constructs like net income, appear less compelling. Restated, brand assets appear more consistent with the notion of premium pricing (i.e., ability to generate top line revenue), and do directly speak to the ability to have more or less net income.

(*AcqSize*), acquirer financing (*AcqFinancing*), acquirer industry growth (*AcqIndGrowth*), acquirer industry competition (*AcqIndCompetition*), and acquirer industry demand risk (*AcqIndDemandRisk*).

The results are presented in Table 11 Panel B. Columns (1), (2), and (3) use acquirer firm sales for one, two, and three years after completion of the deal, respectively. *BrandValue* is significantly positive with future acquirer firm sales across all three periods: for year t+1 (0.08, p -value=0.01); years up to t+2 (0.11, p -value=0.01); and years up to t+3 (0.21, p -value=0.00). This suggests that brand intangible assets do produce long-term revenue for the acquirer firms, and provides *ex post* validation of the capitalization decision made by acquiring firms. For the control variables, acquirer size, industry growth, and industry competition are positively associated with future revenue, as expected.

7. CONCLUSION

This paper examines how the alternative advertising channels (paid search, online display, and traditional) affect the financial reporting treatment of brand asset recognition. The analyses are motivated, in part, by the dramatic shift in advertising expenditures in recent years away from traditional channels (such as television) towards digital channels (including both online display and paid search). I exploit differences in the characteristics of these advertising types to assess their impacts on both the recognition of, as well as the characteristics of, brand assets. To assess the recognition of this intangible asset, I use the setting of M&A, which provides a unique setting in which

to observe reported brand assets. To derive the advertising channels, I use a unique dataset of annual advertising spending in different media outlets, assessed over the period 2011-2016. Of note, this dataset allows for decomposed advertising expenditures into their primary components; prior research either suffers from missing advertising data, or only has aggregated advertising expenses. Consistent with expectations, I find that target firms' spending on traditional and online display advertising exhibits a larger effect on the likelihood of separate brand asset recognition, a more positive impact on any recognized brand asset value, and a larger effect on reported useful life of this brand asset, relative to paid search advertising expenditures. Overall, these results confirm expected heterogeneous effects of different advertising channels on the recognition and valuation of the underlying brand asset.

APPENDICES

Appendix 1: Variable Definitions

Brand Variables	Definition
<i>BrandRecognition</i>	Indicator variable equal to one if acquirer firm recognizes an intangible brand asset, zero otherwise
<i>BrandValue</i>	Log of brand intangible asset value as reported by the acquirer firm, zero if no brand intangible asset is recognized
<i>Amort_Indef</i>	Indicator variable equal to one if acquirer firm recognizes an indefinite useful life associated with the brand asset, zero otherwise
<i>Amort_Life</i>	Number of years of expected useful life for the brand asset, 30 if indefinite
Advertising Variables	
<i>PaidSearch</i>	Target's paid search advertising divided by beginning of the year target firm sales (or total assets), averaged over two years preceding the M&A announcements; if two years of data are unavailable, the one-year paid search advertising in the year preceding acquisition divided by sales (or total assets) is used
<i>OnlineDisplay</i>	Target's online display advertising divided by beginning of the year target firm sales (or total assets), averaged over two years preceding the M&A announcements; if two years of data are unavailable, the one-year online display advertising in the year preceding acquisition divided by sales (or total assets) is used
<i>Traditional</i>	Target's traditional advertising divided by beginning of the year target firm sales (or total assets), averaged over two years preceding the M&A announcements; if two years of data are unavailable, the one-year traditional advertising in the year preceding acquisition divided by sales (or total assets) is used
Control Variables	
<i>AcqLeverage</i>	Acquirer's long-term debt/total assets
<i>AcqFinancing</i>	Acquirer's short-term debt/total assets
<i>AcqTechnology</i>	Acquirer's R&D expenditures/total revenue
<i>AcqSize</i>	Acquirer's logged total assets
<i>AcqBrandMention</i>	Log of the number of times acquirer mention "brand", "trademark", or "tradenname" in the most recent 10K preceding M&A announcement
<i>TargetAcqSize</i>	Target firm total assets deflated by acquirer firm total assets
<i>TargetFirmage</i>	Log of the number of years target firm data exists in Compustat

<i>TargetBTM</i>	Target firm book value deflated by market value
<i>TargetLeverage</i>	Target's long-term debt/total assets
<i>TargetROE</i>	Target's net income/book value of equity
<i>TargetSize</i>	Target logged total revenue
<i>TargetMktShare</i>	Target firm sales/total sales of four-digit SIC code, averaged over three years before M&A
<i>TargetSalesGrowth</i>	Target firm average of three-period year-over-year sales growth
<i>TargetIndGrowth</i>	The average of three-period year-over-year sales growth in the target firm's primary four-digit SIC code
<i>TargetIndDemandRisk</i>	Volatility of sales in the target firm's primary four-digit SIC code
<i>TargetIndCompetition</i>	The sum of top three market shares in target firm's primary four-digit SIC code
Deal Variables	
<i>Premium_Ann</i>	M&A announcement date acquisition premium, deflated by the target firm market value
<i>Premium_1Mon</i>	One month prior to M&A announcement date acquisition premium, deflated by the target firm market value
<i>CompeteBid</i>	Indicator variable equal to one if there is a competing bid for the deal, otherwise zero
<i>M&AStrategy</i>	Indicator variable equal to one if acquirer and target operate in same two-digit SIC industry, otherwise zero
<i>StockPmt</i>	Indicator variable equal to one if the deal is paid partially or fully by acquirer stock, otherwise zero
<i>Tender</i>	Indicator variable equal to one if the deal is a tender offer, otherwise zero
Consequence Variables	
<i>BrandInitial/MV</i>	Brand intangible asset value initially disclosed by acquirer firm in public filings, deflated by market value of equity
<i>BrandInitial/PP</i>	Brand intangible asset value initially disclosed by acquirer firm in public filings, deflated by purchase price of the deal
<i>CAR</i>	3-day CAR of the acquirer around the date of the first public filing in which acquirer recognizes brand intangible asset
<i>AcqSales(t+n)</i>	Log of acquirer total revenue n years after completion of M&A deal
Valuation Variables	
<i>ValuationAdj_AbsAmt</i>	Absolute value of the difference between initially assigned brand value and final value, deflated by final brand value

<i>ValuationAdj_Days</i>	The number of days after M&A completion date when acquirer firm discloses for the first time in public filings, the initial value of brand intangible assets
<i>Appraisal</i>	Indicator variable equal to one if acquirer firm discloses the existence of independent valuation expert in assisting intangible asset valuation process in public filing, zero otherwise
<i>Valuation_Table</i>	Indicator variable equal to one if acquirer firm discloses the categories of intangible assets in a table, zero otherwise
<i>Valuation_Disc</i>	Categorical variable equal to: 1 if acquirer firm discloses neither specific method nor major assumptions in valuing brand asset; 2 if acquirer firm only discloses specific method (e.g., RFRM) in valuing brand asset; 3 if acquirer firm only discloses major assumptions when valuing brand; and otherwise 4 if acquirer firm discloses both specific method and major assumptions when doing brand asset valuation

TABLES

Table 1. Sample Selection and Composition

Panel A: Sample Selection	Observations	
M&A deals with available target advertising data in Kantar	264	
Drop:		
observations without purchase price allocation disclosure	(19)	
observations without necessary control variables	(35)	
Final Sample	210	
<hr/>		
Panel B: Distribution by Brand Recognition and Amortization		
No brand recognition	105	
With brand recognition:	105	
Missing Amortization	3	
Amortization (0–5 years)	21	
Amortization (6–10 years)	23	
Amortization (11–38 years)	17	
Amortization (Indefinite)	41	
Total Sample	210	
<hr/>		
Panel C: Distribution by Target and Acquirer Industry		
	Target	Acquirer
	Freq. Percent Cum.	Freq. Percent Cum.
Agriculture, Forestry and Fishing	12 5.7 5.7	11 5.2 5.2
Manufacturing	67 31.9 37.6	71 33.8 37.6
Transportation & Public Utilities	20 9.5 47.1	24 11.4 50.5
Wholesale and Retail	9 4.3 51.4	9 4.3 54.8
Finance, Insurance, & Real Estate	57 27.1 78.6	55 26.2 80.9
Services	45 21.4 100.0	37 17.6 98.6
Public Administration	0 0.0 100.0	3 1.6 100.0
Total	210 100.0	210 100.0

Panel A presents the sample selection. Panel B presents the distribution by brand recognition and reported amortization schedules. Panel C presents the industry distribution for the target and acquirer firms.

Table 2. Advertising Statistics

Panel A. Advertising and Brand Statistics by Year – Merger and Acquisition Sample ($N = 210$)

Year	<i>CompustatAdv</i> (\$ millions)	<i>KantarAdv</i> (\$ millions)	<i>BrandRecognition</i> (%Percentage)	<i>BrandValue</i> (\$ millions)	<i>BrandAmort</i> (#years)	<i>N(CompAdv)</i> (if nonmissing)	<i>N(KantarAdv)</i>
2010	4.0	0.09	0.33	5.7	4.7	2	6
2011	3.5	0.17	0.86	19.1	15.7	3	7
2012	1.4	0.24	0.23	2.9	5.0	8	13
2013	10.2	4.18	0.45	1,296.9	5.6	15	22
2014	33.3	7.98	0.47	458.4	8.5	15	22
2015	107.0	24.10	0.57	451.5	9.7	30	57
2016	36.3	11.21	0.52	233.3	9.3	26	54
Average	46.3	11.36	0.50	430.9	8.7	113	210

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Panel B. Advertising Statistics by Year – Whole Kantar Public Firm Sample

Year	<i>CompustatAdv</i> (\$ millions)	<i>KantarAdv</i> (\$ millions)	<i>PaidSearch</i> (\$ millions)	<i>OnlineDisplay</i> (\$ millions)	<i>Traditional</i> (\$ millions)	<i>N(CompAdv)</i> (if nonmissing)	<i>N(KantarAdv)</i>
2010	78.8	32.85	1.92	2.80	28.14	761	1,651
2011	87.2	30.57	1.67	2.99	25.91	831	1,753
2012	90.3	29.07	1.36	2.68	25.03	901	1,825
2013	93.4	28.80	1.25	3.02	24.54	928	1,866
2014	87.7	27.92	1.74	2.68	23.50	942	1,907
2015	93.0	27.15	1.98	2.32	22.85	872	1,799
2016	96.7	29.29	2.54	2.33	24.43	820	1,718
Average	89.6	29.39	1.78	2.70	24.92	865	1,788

Panel A presents average advertising expenditures in millions of dollars per Compustat and Kantar and brand characteristics for the M&A sample by year. Panel B presents the whole Kantar sample average advertising expenditures in Compustat and Kantar by year.

Table 3. Sample M&A Firms Advertising and Brand Characteristics

Target_Name	Traditional (\$ 000's)	Online Display (\$ 000's)	Paid Search (\$ 000's)	Acquirer_Name	MA Announcement	Brand Value (\$ 000,000's)	Brand Amort
Lorillard LLC	61,094	97	0	Reynolds American Inc	7/15/2014	27,203	indefinite
Time Warner Inc	1020,489	20,360	10,126	AT&T Inc	10/22/2016	18,081	38
Jarden Corp	19,143	3,719	0	Newell Brands Inc	12/14/2015	8,624	indefinite
Express Scripts Holding Co	726	11	1,084	Cigna Corp	3/8/2018	8,515	indefinite
Salix Pharmaceuticals Ltd	752	528	420	Bausch Health Cos Inc	2/22/2015	6,756	11
Aetna Inc	13,130	717	6,438	CVS Health Corp	12/3/2017	4,165	indefinite
Precision Castparts Corp	5	3	0	Berkshire Hathaway Inc	8/10/2015	2,300	indefinite
LinkedIn Corp	39	2,575	1,278	Microsoft Corp	6/13/2016	2,148	20
Snyder's-Lance Inc	12,446	1,237	149	Campbell Soup Co	12/18/2017	2,131	indefinite
Whole Foods Market Inc	12,027	1,227	0	Amazon.com Inc	6/16/2017	1,928	25
Rockwell Collins Inc	68	26	0	United Technologies Corp	9/5/2017	1,870	indefinite
Pall Corp	4	10	0	Danaher Corp	5/13/2015	1,330	indefinite
Kate Spade & Co LLC	9,490	367	2,888	Tapestry Inc	5/8/2017	1,300	indefinite
Cameron International Corp	13	0	0	Schlumberger Ltd	8/26/2015	1,225	25
Scripps Networks Interactive	13,597	1,050	4,358	Discovery Inc	7/31/2017	1,225	10
OpenTable Inc	4	19	229	Booking Holdings Inc	6/13/2014	1,100	20

This table displays select M&A sample observations, based on the sixteen largest brand assets recognized in the acquisition. *Traditional*, *Online Display*, and *Paid Search* are the target firm's annual advertising expenditures (in thousands) in the year preceding the M&A announcement. *Brand Value* is the acquirer's brand intangible assets amount (in millions) recognized on the acquirer balance sheet. *Brand Amort* is the number of years of reported expected useful life for the brand asset.

Table 4. Descriptive Statistics

Variable	N	P25	Mean	Median	P75	SD
Brand Variables						
<i>BrandRecognition</i>	210	0.00	0.50	0.50	1.00	0.50
<i>BrandValue</i>	210	0.00	2.06	0.02	3.89	2.62
<i>Amort_Indef</i>	207	0.00	0.20	0.00	0.00	0.40
<i>Amort_Life</i>	207	0.00	8.66	0.00	17.00	11.95
Advertising Variables						
Advertising Deflated by Sales						
<i>PaidSearch</i>	210	0.00	0.64	0.00	0.01	2.65
<i>OnlineDisplay</i>	210	0.00	0.93	0.01	0.16	3.87
<i>Traditional</i>	210	0.00	2.81	0.02	0.83	10.03
Advertising Deflated by Assets						
<i>PaidSearch</i>	210	0.00	0.84	0.00	0.00	4.51
<i>OnlineDisplay</i>	210	0.00	0.62	0.00	0.08	2.79
<i>Traditional</i>	210	0.00	2.70	0.01	0.17	12.75
Control Variables						
<i>AcqLeverage</i>	210	0.18	2.03	0.54	1.08	8.25
<i>AcqFinancing</i>	210	0.00	0.04	0.02	0.05	0.07
<i>AcqTechnology</i>	210	0.00	0.04	0.00	0.06	0.08
<i>AcqSize</i>	210	7.62	8.63	8.60	9.65	1.88
<i>AcqIndGrowth</i>	157	0.18	1.80	0.38	0.83	6.29
<i>AcqIndCompetition</i>	157	0.26	0.52	0.48	0.74	0.27
<i>AcqBrandMention</i>	210	1.10	2.25	2.52	3.33	1.52
<i>AcqIndDemandRisk</i>	157	2,947	11,792	8,375	12,969	16,032
<i>TargetMktShare</i>	210	0.00	0.04	0.01	0.04	0.10
<i>TargetSalesGrowth</i>	210	-0.04	0.29	0.15	0.42	0.74
<i>TargetIndGrowth</i>	210	0.13	6.32	0.28	1.22	39.83
<i>TargetIndDemandRisk</i>	210	1,640	8,846	5,155	11,628	14,138
<i>TargetIndCompetition</i>	210	0.34	0.52	0.51	0.71	0.25
<i>TargetBTM</i>	210	0.65	2.46	1.05	3.48	2.88
<i>TargetSize</i>	210	4.91	6.24	6.19	7.35	1.73
<i>TargetLev</i>	210	0.00	0.47	0.35	0.91	2.84
<i>TargetROE</i>	210	-0.03	0.16	0.06	0.13	2.64
<i>TargetAcqSize</i>	210	0.10	0.63	0.30	0.64	1.26
<i>TargetFirmage</i>	210	2.30	2.87	2.89	3.26	0.65
<i>MAStrategy</i>	210	0.00	0.45	0.00	1.00	0.50
Deal Variables						
<i>Premium_1Mon</i>	210	13.70	29.21	26.45	40.05	26.44
<i>Premium_Ann</i>	210	14.39	28.90	26.63	40.61	23.19
<i>Competebid</i>	210	0.00	0.00	0.00	0.00	0.07
<i>Same_ind</i>	210	0.00	0.45	0.00	1.00	0.50
<i>Stockpmt</i>	210	0.00	0.61	1.00	1.00	0.49
<i>Tender</i>	210	0.00	0.21	0.00	0.00	0.41
Consequence Variables						
<i>BrandInitial/MV</i>	100	0.02	0.14	0.06	0.14	0.23
<i>BrandInitial/PP</i>	100	0.02	0.09	0.04	0.10	0.15

<i>Acq Sales(t+1)</i>	157	6.55	7.99	8.05	9.41	1.92
<i>AcqSales(t+2)</i>	100	6.53	8.03	7.98	9.41	1.93
<i>AcqSales(t+3)</i>	48	6.52	7.86	8.22	9.45	1.96
<i>CAR</i>	100	-0.03	-0.01	-0.01	0.01	0.05
Valuation Variables						
<i>ValuationAdj_AbsAmt</i>	89	0.00	0.40	0.12	0.47	0.74
<i>ValuationAdj_Days</i>	89	-86.00	0.54	35.00	81.00	132.29
<i>Appraisal</i>	89	0.00	0.18	0.00	0.00	0.39
<i>Valuation_Table</i>	89	1.00	0.81	1.00	1.00	0.40
<i>Valuation_Disc</i>	89	1.00	2.39	2.00	4.00	1.23

This table presents descriptive statistics for the variables. The values of all continuous variables are winsorized at 1% and 99%. All variables are defined in Appendix A.

Table 5. Correlations

	<i>Brand Recognition</i>	<i>BrandValue</i>	<i>Amort_Indef</i>	<i>Amort_Life</i>	<i>Premium _Ann</i>	<i>Premium _1Mon</i>
Advertising deflated by Sales						
<i>PaidSearch</i>	0.09	0.13	0.06	0.06	0.01	0.01
<i>OnlineDisplay</i>	0.20	0.18	0.13	0.17	-0.15	-0.06
<i>Traditional</i>	0.16	0.27	0.24	0.21	0.01	0.01
Advertising deflated by Assets						
<i>PaidSearch</i>	0.10	0.12	0.05	0.05	0.06	0.05
<i>OnlineDisplay</i>	0.18	0.16	0.14	-0.13	-0.11	-0.05
<i>Traditional</i>	0.19	0.28	0.21	0.20	0.06	0.01

This table provides the Pearson correlations between major variables used in the regression analysis. Bolded numbers indicate significance at 10% level.

Table 6. The Impact of Advertising Expenditure Type on Brand Asset Recognition

Variables	Pred Sign	Dependent Variable = <i>BrandRecognition</i>			
		Advertising Scaled by Sales		Advertising Scaled by Assets	
		(1)	(2)	(3)	(4)
<i>Traditional</i>	+	0.12*		0.26***	
		(0.06)		(0.01)	
<i>OnlineDisplay</i>	+	0.18***		0.22**	
		(0.00)		(0.04)	
<i>Traditional + OnlineDisplay</i>	+		0.28**		0.47***
			(0.02)		(0.01)
<i>PaidSearch</i>	?	-0.11	-0.09	-0.10	-0.10
		(0.30)	(0.38)	(0.21)	(0.22)
<i>MAStrategy</i>	+	0.87**	0.87**	0.83**	0.83**
		(0.03)	(0.03)	(0.04)	(0.04)
<i>TargetFirmage</i>	+	0.54*	0.54*	0.54*	0.54*
		(0.07)	(0.06)	(0.06)	(0.06)
<i>TargetIndGrowth</i>	+	-0.00	-0.00	-0.00	-0.00
		(0.36)	(0.38)	(0.39)	(0.37)
<i>TargetSalesGrowth</i>	+	0.20	0.21	0.23	0.23
		(0.22)	(0.21)	(0.19)	(0.18)
<i>TargetMktShare</i>	+	3.78	3.75	3.74	3.80
		(0.19)	(0.19)	(0.19)	(0.18)
<i>TargetIndCompetition</i>	+	5.40***	5.37***	5.33***	5.32***
		(0.00)	(0.00)	(0.00)	(0.00)
<i>TargetIndDemandRisk</i>	+	0.00	0.00	0.00	0.00
		(0.39)	(0.39)	(0.35)	(0.35)
<i>AcqBrandMention</i>	+	0.38**	0.38**	0.35**	0.35*
		(0.03)	(0.03)	(0.04)	(0.04)
<i>AcqLeverage</i>	+	-0.01	-0.01	-0.01	-0.01
		(0.65)	(0.65)	(0.76)	(0.77)
<i>AcqFinancing</i>	+	0.18	0.13	-0.17	-0.21
		(0.48)	(0.49)	(0.97)	(0.96)
<i>AcqSize</i>	+	-0.15	-0.15	-0.16	-0.16
		(0.19)	(0.19)	(0.15)	(0.14)
Intercept		-5.76***	-5.76***	-5.72***	-5.70***
		(0.00)	(0.00)	(0.00)	(0.00)

Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
<i>N</i>	210	210	210	210
Pseudo <i>R</i> ²	0.435	0.435	0.438	0.438
Test of Coefficients (H1) (<i>p</i>-values)				
<i>Traditional = PaidSearch</i>	0.048**		0.038**	
<i>OnlineDisplay = PaidSearch</i>	0.029**		0.032**	
<i>Traditional+OnlineDisplay = PaidSearch</i>		0.033**		0.024**

This table presents the logistic regression results of Equation (1), investigating the effect of advertising expenditure types on the recognition of brand assets for firms that are subsequently acquired. The dependent variable is *BrandRecognition*, an indicator variable equal to one if the acquirer firm recognizes a separate brand intangible asset, and zero otherwise. Year and industry fixed effects are included. Standard errors are clustered at the acquirer firm level. *p*-values are presented in parentheses. ***, **, * represent significance at the 0.01, 0.05, and 0.10 level, based on the indicated one-tailed or two-tailed tests of significance.

Table 7. The Impact of Advertising Expenditure Type on Brand Valuation

Variables	Pred Sign	Dependent Variable = <i>Brand Value</i>			
		Advertising Scaled by Sales		Advertising Scaled by Assets	
		(1)	(2)	(3)	(4)
<i>Traditional</i>	+	0.04** (0.04)		0.07*** (0.01)	
<i>OnlineDisplay</i>	+	0.07* (0.09)		0.06* (0.09)	
<i>Traditional + OnlineDisplay</i>	+		0.08*** (0.00)		0.09*** (0.00)
<i>PaidSearch</i>	?	-0.02 (0.72)	0.01 (0.99)	-0.07 (0.54)	-0.02 (0.80)
<i>MAStrategy</i>	+	0.39 (0.23)	0.44 (0.20)	0.54 (0.15)	0.62 (0.12)
<i>TargetFirmage</i>	+	0.50 (0.13)	0.51 (0.12)	0.60* (0.09)	0.60* (0.09)
<i>TargetIndGrowth</i>	+	-0.00 (0.30)	-0.00 (0.21)	-0.00 (0.44)	-0.00 (0.29)
<i>TargetSalesGrowth</i>	+	0.07 (0.41)	0.11 (0.38)	0.01 (0.49)	0.03 (0.49)
<i>TargetMktShare</i>	+	4.06 (0.10)	4.28* (0.09)	4.18* (0.09)	4.48* (0.08)
<i>TargetIndCompetition</i>	+	5.54*** (0.00)	5.49*** (0.00)	5.45*** (0.00)	5.48*** (0.00)
<i>TargetIndDemandRisk</i>	+	0.00 (0.43)	0.00 (0.42)	0.00 (0.41)	0.00 (0.41)
<i>AcqBrandMention</i>	+	0.91*** (0.00)	0.95*** (0.00)	0.90*** (0.00)	0.95*** (0.00)
<i>AcqLeverage</i>	+	-0.07* (0.05)	-0.06* (0.05)	-0.06 (0.11)	-0.06 (0.11)
<i>AcqFinancing</i>	+	-2.50 (0.55)	-3.32 (0.45)	-2.45 (0.58)	-3.16 (0.50)
<i>AcqSize</i>	+	0.37** (0.02)	0.38*** (0.01)	0.37** (0.02)	0.39** (0.02)
<i>IMRBrand</i>		-3.40*** (0.00)	-3.45*** (0.00)	-2.55** (0.01)	-2.58*** (0.01)
Intercept		-4.26 (0.16)	-4.28 (0.16)	-6.06** (0.05)	-6.13** (0.05)

Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
<i>N</i>	210	210	210	210
Pseudo <i>R</i> ²	0.181	0.182	0.180	0.180
Test of Coefficients (H2a) (<i>p</i>-values)				
<i>Traditional = PaidSearch</i>	<i>0.074*</i>		<i>0.091*</i>	
<i>OnlineDisplay = PaidSearch</i>	<i>0.093*</i>		<i>0.086*</i>	
<i>Traditional+OnlineDisplay = PaidSearch</i>	<i>0.048**</i>			<i>0.042**</i>

This table presents the regression results of Equations (3), investigating the effect of advertising expenditure type on the amount of brand value. The dependent variable is *BrandValue*, which is the log of brand intangible asset value. Year and industry fixed effects are included. Standard errors are clustered at the target firm level. *p*-values are presented in parentheses. ***, **, * represent significance at the 0.01, 0.05, and 0.10 level, based on the indicated one-tailed or two-tailed tests of significance.

Table 8. Impact of Advertising Expenditure Type on Brand Amortization

Variables	Pred Sign	Panel A. Dependent Variable = <i>Amort_Indef</i>				Panel B. Dependent Variable = <i>Amort_Life</i>			
		Advertising Scaled by Sales		Advertising Scaled by Assets		Advertising Scaled by Sales		Advertising Scaled by Assets	
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Traditional</i>	+	0.06** (0.05)		0.03* (0.09)		0.71** (0.03)		0.51* (0.08)	
<i>OnlineDisplay</i>	+	0.07* (0.05)		0.10* (0.08)		0.41 (0.14)		0.76* (0.10)	
<i>Traditional + OnlineDisplay</i>	+		0.07** (0.02)		0.04** (0.02)		0.72** (0.02)		0.62** (0.02)
<i>PaidSearch</i>	?	-0.14 (0.28)	-0.05 (0.63)	-0.04 (0.60)	0.01 (0.88)	-0.48 (0.31)	0.29 (0.34)	-0.19 (0.34)	0.29 (0.25)
<i>MAStrategy</i>	+	0.11 (0.41)	0.15 (0.38)	0.03 (0.46)	0.05 (0.46)	5.05 (0.13)	5.71 (0.11)	3.35 (0.23)	3.89 (0.20)
<i>TargetFirmage</i>	+	1.01*** (0.01)	1.00*** (0.01)	0.75* (0.06)	0.71* (0.06)	7.62** (0.03)	7.74** (0.03)	7.43** (0.03)	7.48** (0.03)
<i>TargetIndGrowth</i>	+	0.00 (0.25)	0.00 (0.29)	0.00 (0.14)	0.00 (0.14)	0.07 (0.10)	0.05 (0.15)	0.06 (0.13)	0.04 (0.17)
<i>TargetSalesGrowth</i>	+	-0.03 (0.46)	0.00 (0.50)	0.05 (0.42)	0.06 (0.43)	0.61 (0.41)	0.81 (0.39)	1.94 (0.25)	2.11 (0.23)
<i>TargetMktShare</i>	+	1.92 (0.27)	2.08 (0.25)	1.62 (0.32)	1.61 (0.32)	21.53 (0.21)	25.06 (0.17)	19.24 (0.23)	22.20 (0.19)
<i>TargetIndCompetition</i>	+	1.21 (0.15)	1.28 (0.14)	0.98 (0.17)	0.89 (0.20)	41.7*** (0.00)	41.8*** (0.00)	41.3*** (0.00)	41.3*** (0.00)
<i>TargetIndDemandRisk</i>	+	0.00 (0.36)	0.00 (0.42)	-0.00 (0.32)	-0.00 (0.28)	-0.00 (0.76)	-0.00 (0.76)	-0.00 (0.80)	-0.00 (0.80)

<i>AcqBrandMention</i>	+	1.04*** (0.00)	1.09*** (0.00)	0.95*** (0.00)	1.00*** (0.00)	6.88*** (0.00)	7.42*** (0.00)	6.88*** (0.00)	7.44*** (0.00)
<i>AcqLeverage</i>	+	-0.01 (0.69)	-0.01 (0.71)	-0.01 (0.83)	-0.01 (0.83)	-0.24 (0.46)	-0.22 (0.49)	-0.31 (0.31)	-0.29 (0.33)
<i>AcqFinancing</i>	+	-5.85 (0.25)	-6.02 (0.22)	-6.77 (0.16)	-7.03 (0.14)	12.62 (0.37)	5.60 (0.45)	11.09 (0.39)	4.73 (0.45)
<i>AcqSize</i>	+	-0.06 (0.75)	-0.05 (0.79)	-0.20 (0.18)	-0.20 (0.18)	0.35 (0.40)	0.43 (0.38)	0.29 (0.42)	0.31 (0.42)
<i>IMRBrand</i>	?	-3.03*** (0.00)	-2.97*** (0.01)	-0.39 (0.45)	-0.43 (0.40)	-25.1*** (0.00)	-25.2*** (0.00)	-38.1*** (0.00)	-38*** (0.00)
Intercept		-3.88** (0.05)	-4.14** (0.04)	-3.94* (0.08)	-4.03* (0.07)	-35.84 (0.12)	-36.82 (0.11)	-14.27 (0.53)	-14.68 (0.52)
Industry FE		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>N</i>		207	207	207	207	207	207	207	207
Pseudo <i>R</i> ²		0.404	0.403	0.387	0.380	0.159	0.157	0.165	0.163
Test of Coefficients(H2b)(<i>p</i>-values)									
<i>Traditional = PaidSearch</i>		0.081*		0.095*		0.058*		0.073*	
<i>OnlineDisplay = PaidSearch</i>		0.092*		0.077*		0.146		0.085*	
<i>Traditional+OnlineDisplay = PaidSearch</i>			0.078*		0.071*		0.168		0.167

This table presents the regression results of Equation (4), investigating the effect of advertising expenditure type on the chosen amortization life for the brand asset for firms that are acquired. The dependent variable for Panel A is *AmortIndef*, which is an indicator variable equal to one if the acquirer firm estimates an indefinite useful life of brand asset, and zero otherwise; the dependent variable for Panel B is *AmortLife*, which is the reported number of years of expected useful life for the brand intangible asset (set equal to 30 if designated as an indefinite life). Year and industry fixed effects are included. Standard errors are clustered at the target firm level. *p*-values are presented in parentheses. ***, **, * represent significance at the 0.01, 0.05, and 0.10 level, based on the indicated one-tailed or two-tailed tests of significance.

Table 9. Impact of Advertising Expenditure Type on Acquisition Premium

Variables	Pred Sign	Panel A: DV = <i>Premium_Ann</i>		Panel B: DV = <i>Premium_1Mon</i>	
		Sales	Assets	Sales	Assets
		(1)	(2)	(3)	(4)
<i>Traditional</i>	+	0.44*** (0.00)	0.51*** (0.00)	0.48*** (0.00)	0.57*** (0.00)
<i>OnlineDisplay</i>	+	-0.83*** (0.00)	-1.97*** (0.00)	-0.96*** (0.00)	-2.04*** (0.00)
<i>PaidSearch</i>	?	-1.15** (0.04)	-0.67* (0.10)	-1.17* (0.06)	-0.77 (0.12)
<i>TargetAcqSize</i>	-	-4.19*** (0.00)	-4.22*** (0.00)	-2.04* (0.10)	-2.05* (0.09)
<i>TargetBTM</i>	-	-0.83 (0.26)	-0.78 (0.29)	0.05 (0.96)	0.11 (0.90)
<i>TargetSize</i>	+	-0.36 (0.72)	-0.71 (0.49)	-0.26 (0.82)	-0.56 (0.64)
<i>TargetLev</i>	-	-0.77* (0.07)	-0.80* (0.06)	-1.23** (0.03)	-1.27** (0.03)
<i>TargetROE</i>	+	-0.18 (0.88)	-0.14 (0.91)	0.02 (0.99)	0.06 (0.97)
<i>CompeteBid</i>	+	19.81** (0.04)	18.90** (0.04)	16.36* (0.07)	15.65* (0.08)
<i>MAStrategy</i>	?	-1.15 (0.68)	-0.67 (0.81)	-5.62 (0.11)	-5.17 (0.13)
<i>StockPmt</i>	-	-9.28*** (0.01)	-9.77*** (0.01)	-7.63* (0.05)	-8.20** (0.05)
<i>Tender</i>	+	18.70*** (0.00)	18.24*** (0.00)	20.39*** (0.00)	20.22*** (0.00)
Intercept		55.68*** (0.00)	61.64*** (0.00)	55.27*** (0.00)	60.03*** (0.00)
Industry FE		Yes	Yes	Yes	Yes
Year FE		Yes	Yes	Yes	Yes
<i>N</i>		210	210	210	210
<i>R</i> ²		0.333	0.323	0.275	0.267

This table presents the regression results of Equation (5), investigating the effect of advertising expenditure type on M&A deal premium. The dependent variable for Panel A is *Premium_Ann*, which is the M&A announcement date acquisition premium as a percentage of the target firm's pre-announcement market value; the dependent variable

for Panel B is *Premium_1Mon*, which is the 1 month before M&A announcement date acquisition premium as a percentage of the target firm's pre-announcement market value. Year and industry fixed effects are included. Standard errors are clustered at the target firm level. *p*-values are presented in parentheses. ***, **, * represent significance at the 0.01, 0.05, and 0.10 level, based on the indicated one-tailed or two-tailed tests of significance.

Table 10. Endogeneity

Variables	Pred. Sign	Panel A. Dependent Variable = <i>BrandRecognition</i>				Panel B. Dependent Variable = <i>BrandValue</i>			
		Advertising Scaled by Sales		Advertising Scaled by Assets		Advertising Scaled by Sales		Advertising Scaled by Assets	
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Traditional</i>	+	0.12*		0.26***		0.07***		0.05**	
		(0.06)		(0.01)		(0.00)		(0.03)	
<i>OnlineDisplay</i>	+	0.17***		0.20*		0.06*		0.06	
		(0.01)		(0.06)		(0.09)		(0.25)	
<i>Traditional + OnlineDisplay</i>	+		0.27**		0.45***		0.09***		0.08***
			(0.02)		(0.01)		(0.00)		(0.00)
<i>PaidSearch</i>	?	-0.10	-0.09	-0.10	-0.09	-0.07	-0.02	-0.02	0.00
		(0.32)	(0.40)	(0.22)	(0.23)	(0.56)	(0.82)	(0.74)	(0.94)
<i>MAStrategy</i>	+	0.90**	0.90**	0.86**	0.87**	0.57	0.63	0.42	0.46
		(0.02)	(0.02)	(0.03)	(0.03)	(0.15)	(0.12)	(0.21)	(0.20)
<i>TargetFirmage</i>	+	0.57**	0.57**	0.57**	0.57**	0.61*	0.60*	0.51	0.52
		(0.5)	(0.5)	(0.04)	(0.04)	(0.08)	(0.09)	(0.12)	(0.12)
<i>TargetIndGrowth</i>	+	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00
		(0.38)	(0.39)	(0.42)	(0.39)	(0.46)	(0.30)	(0.32)	(0.21)
<i>TargetSalesGrowth</i>	+	0.22	0.22	0.24	0.25	0.01	0.03	0.08	0.11
		(0.20)	(0.20)	(0.17)	(0.17)	(0.49)	(0.47)	(0.42)	(0.38)
<i>TargetMktShare</i>	+	3.84	3.82	3.78	3.85	4.09*	4.45*	3.95	4.23*
		(0.20)	(0.20)	(0.20)	(0.20)	(0.09)	(0.08)	(0.10)	(0.09)
<i>TargetIndCompetition</i>	+	5.41***	5.39***	5.37***	5.36***	5.45***	5.48***	5.52***	5.49***
		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)

	<i>TargetIndDemandRisk</i>	+	0.00 (0.36)	0.00 (0.36)	0.00 (0.32)	0.00 (0.32)	0.00 (0.40)	0.00 (0.41)	0.00 (0.42)	0.00 (0.42)	
	<i>AcqBrandMention</i>	+	0.37** (0.02)	0.38** (0.02)	0.34** (0.04)	0.34** (0.04)	0.90*** (0.00)	0.95*** (0.00)	0.90*** (0.00)	0.95*** (0.00)	
	<i>AcqLeverage</i>	+	-0.01 (0.73)	-0.01 (0.73)	-0.00 (0.86)	-0.00 (0.87)	-0.06 (0.12)	-0.06 (0.11)	-0.06* (0.06)	-0.06* (0.06)	
	<i>AcqFinancing</i>	+	0.23 (0.38)	0.17 (0.38)	-0.11 (0.98)	-0.15 (0.97)	-2.26 (0.61)	-3.10 (0.51)	-2.26 (0.59)	-3.20 (0.47)	
	<i>AcqSize</i>	+	-0.15 (0.21)	-0.15 (0.21)	-0.15 (0.17)	-0.16 (0.16)	0.38** (0.02)	0.39** (0.02)	0.37** (0.02)	0.38*** (0.01)	
	<i>IMRBrand</i>	?					-2.57** (0.01)	-2.59*** (0.01)	-3.45*** (0.00)	-3.48*** (0.00)	
	<i>IMRTgt</i>	?	0.38 (0.54)	0.40 (0.52)	0.43 (0.48)	0.42 (0.49)	0.24 (0.72)	0.09 (0.88)	0.30 (0.65)	0.16 (0.80)	
59	Intercept		-6.06*** (0.00)	-6.07*** (0.00)	-6.09*** (0.00)	-6.06*** (0.00)	-6.21** (0.04)	-6.19** (0.04)	-4.40 (0.14)	-4.38 (0.15)	
	Industry FE		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
	Year FE		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
	<i>N</i>		210	210	210	210	210	210	210	210	
	Pseudo <i>R</i> ²		0.437	0.437	0.440	0.440	0.180	0.180	0.181	0.182	
	Test of Coefficients(H2a)(p-values)										
	<i>Traditional = PaidSearch</i>		0.051*		0.017**		0.077*		0.090*		
	<i>OnlineDisplay = PaidSearch</i>		0.035**		0.022**		0.095*		0.097*		
	<i>Traditional+OnlineDisplay = PaidSearch</i>		0.037**		0.013**		0.042**		0.038*		

This table presents results of the main tests controlling for potential selection bias of target firms. Column (1) and (2) show the effect of advertising (deflated by total revenue and total asset, respectively) on brand asset recognition. The dependent variable is *BrandRecognition*, an indicator variable equal to one if the acquirer firm recognizes a separate brand intangible

asset, and zero otherwise. Panel B shows the effect of advertising (deflated by total revenue and total asset, respectively) on brand asset value. The dependent variable is *BrandValue*, the log of brand intangible asset value. Year fixed effects are included. Standard errors are clustered at the acquirer firm level. *p*-values are presented in parentheses. ***, **, * represent significance at the 0.01, 0.05, and 0.10 level, based on the indicated one-tailed or two-tailed tests of significance.

Table 11. Investor Reaction to Brand and Impact of Brand Assets on Future Revenue

Panel A				
Variables	Pred Sign	Dependent Variable = CAR		
		Log(Brand) (1)	Brand/MV (2)	Brand/PP (3)
<i>Brand</i>	+	0.0026** (0.04)	0.0192** (0.03)	0.0374** (0.02)
Intercept		-0.0228*** (0.00)	-0.0140** (0.02)	-0.0150** (0.01)
<i>N</i>		100	100	100
Adj. <i>R</i> ²		0.016	0.008	0.013

Panel B				
Variables	Pred Sign	AcqSales(t+1)	AcqSales(t+2)	AcqSales(t+3)
		(1)	(2)	(3)
<i>BrandValue</i>	+	0.08*** (0.01)	0.11** (0.01)	0.21*** (0.00)
<i>AcqLeverage</i>	?	0.01 (0.40)	0.01 (0.69)	0.00 (0.91)
<i>AcqSize</i>	+	0.90*** (0.00)	0.88*** (0.00)	0.92*** (0.00)
<i>AcqFinancing</i>	?	-0.90 (0.46)	-2.36 (0.16)	0.81 (0.58)
<i>AcqIndGrowth</i>	+	0.01* (0.06)	0.02 (0.12)	0.01* (0.06)
<i>AcqIndCompetition</i>	+	2.60*** (0.00)	2.66*** (0.00)	2.94*** (0.00)
<i>AcqIndDemandRisk</i>	?	0.00* (0.07)	0.00 (0.15)	0.00 (0.99)
Intercept		-0.84* (0.08)	-0.86 (0.28)	-1.47 (0.38)
Year FE		Y	Y	Y
<i>N</i>		157	100	48
Adj. <i>R</i> ²		0.839	0.834	0.783

This table presents additional analyses results of the consequence of recognized brand asset. Panel A shows investor reaction to brand asset recognition. The dependent

variable is the 3-day CAR of acquirer firm around the date of the first public filing in which acquirer firm recognizes brand asset. Panel B shows the regression results of Equation (6), investigating the effect of brand intangible assets on acquirer firm future revenue. The dependent variable is log of acquirer firm's total revenue one/two/three years after completion of M&A deal. Year fixed effects are included. Standard errors are clustered at the acquirer firm level. p -values are presented in parentheses. ***, **, * represent significance at the 0.01, 0.05, and 0.10 level, based on the indicated one-tailed or two-tailed tests of significance.

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