Review of Marketing Science

The Internalization of Advertising Services: An Inter-Industry Analysis

Sharon Horsky[*]   Steven C. Michael[†]

Alvin J. Silk[‡]

[*]Graduate School of Business Administration, Bar-Ilan University, Sharon.Horsky@biu.ac.il

[†]College of Business, University of Illinois at Urbana-Champaign, smichael@illinois.edu

[‡]Graduate School of Business Administration, Harvard University, asilk@hbs.edu

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Abstract

This study investigates the extent to which U.S. advertisers use in-house rather than independent advertising agencies and examines inter-industry variation in such internalization. Contrary to the widely-held impression that use of an in-house advertising agency is more the exception than the rule, we find that vertical integration of advertising services is much more widespread than has hitherto been appreciated. Drawing on concepts from research on scale economies and transaction costs, we develop a set of hypotheses about differences in the expected depth of internalization across industries. We test these hypotheses in cross sectional analyses of data covering 69 two digit SIC industries at two points in time, 1991 and 1999. In both years, approximately half of advertisers of all sizes operated an in-house agency. Across industries, we find that the likelihood of internalization of at least some advertising services decreases as the size of advertising outlays increase but increases as advertising intensity and technological intensity increase and is greater for "creative" industries.

KEYWORDS: advertising agencies, in-house, vertical integration, make or buy

"The man who acts as his own advertising agent sometimes has a fool for a client."
Nathaniel C. Fowler (*Fowler's Publicity*, 1904, p. 192)

1   INTRODUCTION

Does Nathaniel Fowler's century-old barb still resonate today? The in-house agency has long been viewed as a departure from the mainstream of advertising practice, a rarity if not an oddity. Advertising textbooks often present use of an in-house agency as a minority practice, more the exception rather the rule. For example, Tellis (1998) noted that "external agencies are the norm among large advertisers" but observed that "some major advertisers, such as Benetton and Calvin Klein, use internal agencies" (p. 75). After enumerating the "advantages of internal agencies" and the "benefits of external agencies," he enunciated a "general principle" that prescribed the rejection of vertical integration "in the presence of a competitive market of suppliers." Tellis then advised: "The advertiser is better off picking an agency from the wealth of agencies in the market, rather than trying to develop one internally" (p. 76). But Wells et al. (2003) observed that "Despite the many advantages agencies offer their clients, there are instances where firms are better off doing the work themselves," and they identified retailers such as Pier 1 and Nieman Marcus as examples (p. 83).

The treatment of in-house agencies found in contemporary textbooks reflects the state of current knowledge about in-house advertising agencies. While the integration of distribution channels and sales forces has attracted a large and ongoing stream of research on governance in marketing (e.g., Rindfleisch and Heide 1997), internalization of advertising services has remained largely a dormant and underdeveloped research topic for several decades. Over the years, advertisers' interest in establishing in-house agencies ("self-sufficiency") has waxed and waned (Loomis 1972), and numerous papers discussing the pros and cons of outside versus in-house agencies have appeared in trade and management literature dating back at least to the 1970s. But a revival of interest by advertisers in the internalization of advertising services appears to be underway (Douglas 2004). A recent study conducted by the Association of National Advertisers (ANA 2008) reported that more than 40% of its membership, which consists of large national advertisers, actually operate in-house agencies, in contrast to the 11% penetration level documented in their last survey in 1975 (ANA 1976).[1] A

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[1] Historical evidence suggests that reliance by major national advertisers on external rather than internal agencies emerged as the dominant industry policy early in the evolution of modern advertising (Pope 1983). To our knowledge, the only time series available relating to the use of in-house agencies is found in Hasse et al. (1934) covering the period from 1924–33. They found that the share of advertisers who negotiated their own media placement was stable at 24% from 1924–

trade association of in-house agencies, the In-House Agency Forum (IHAF), reported that 58% of its member agencies have been operating for ten years or more (Stiglin 2010).

In this paper, we investigate the question of how and why the use of in-house agencies varies across industries. Our investigation leads to a theoretical and empirical analysis of two recurring themes found in the existing management and trade literature on in-house agencies; namely that: (a) internalization of advertising services varies widely across different industries or sectors of the U.S. economy; and (b) cost considerations are a major factor underlying decisions to undertake such internalization. A better understanding of these factors should both encourage and support further analyses of the structure and processes surrounding vertical relations in the advertising and marketing services industry.

Numerous authors have noted that use of in-house agencies appears more prevalent in some industries or sectors than others (e.g., Anderson and Weitz 1986, Clark 2003), and some evidence corroborates this view (American Association of Advertising Agencies 1982, Ripley 1991). Whereas inter-industry differences with respect to the purposes and intensity of advertising have been extensively investigated (Comanor and Wilson 1974), inter-industry variation in the internalization of advertising services has not received comparable attention. Similarly, whether cost saving can be realized by internalizing advertising services is an issue that has often been discussed in the management and trade literature on in-house agencies (e.g., Britt et al. 1975, Bursk and Sethi 1976, Newton 1965, Pulver 1979) but has not been the subject of theoretical and empirical research.

In general, research on the economics of the supply of advertising services is scarce (Bagwell 2007). The only relevant study addressing governance issues theoretically and empirically is Horsky (2006). Her focus was on decisions made by *large* advertisers with respect to the choice between bundled or unbundled advertising services (whether purchased externally or organized internally), as observed at the firm level and at a single point in time (1999). The present study takes a different approach.

First, for reasons mentioned above, we analyze *inter-industry differences* in the internalization of advertising services by drawing on theories of vertical integration that suggest such cross-industry variation is influenced by both *production* (margins, double marginalization, and scale economies) and *transaction* costs (Lafontaine and Slade 2007). Second, given our focus on cross-industry analysis, the unit of analysis in this study is an *industry* and we employ a global measure of internalization, the *share* of all firms operating in a given industry who *report use of any in-house agency*. This share combines hybrid

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27, then dropped to 19% in 1928 just prior to the onslaught of the Depression, and continued to rise, reaching 28% in 1933, the last year for which the series was reported.

cases of "partial" vertical integration (where some services are supplied in-house and others by external agencies) with cases of "full" vertical integration where the in-house agency is a full-service operation and no outside agencies are employed. Third, our database encompasses *advertisers of all sizes* operating in 69 two-digit SIC industries at two points in time (1991 and 1999) that bracket a major business cycle in the U.S. economy.

This design enables us to develop a comprehensive picture of the incidence of integration of advertising services across the economy at a critical juncture in the industry's history. The decade of the 1990s was a period when the institutional arrangements that served as barriers to internalization had been eroded (Arzaghi et al. 2010). Also, this period encompasses the initial growth phase of the internet as an advertising medium, which was interrupted by the 2001 economic downturn.

We find vertical integration in this domain to be more widespread than previously recognized. Almost half of *all* U.S. advertisers had internalized at least some advertising services in the decade of the 1990s. We further find that across industries the incidence of in-house agencies differs widely, with the share of advertisers that utilize some internalized services ranging from 17% to 75%. Moreover, our empirical analysis indeed indicates that internalization of advertising services varies across industries in ways consistent with theories of vertical integration.

The remainder of the paper is organized as follows. Section 2 develops our hypotheses, and Section 3 describes the databases, econometric model, and methods used to test the hypotheses, and presents results. Section 4 discusses managerial implications and directions for further research, and Section 5 summarizes our conclusions.

2   THEORETICAL FRAMEWORK AND HYPOTHESIS DEVELOPMENT

The institutional structure that emerged in the U.S. advertising industry's formative years has had a lasting effect on the industry's organization and practices (Pope 1983). Taking into account that structure as well as the contemporary developments affecting advertising agency economics and client relations, we develop five hypotheses about inter-industry variation in internalization of advertising services.

2.1   Production Costs: Scale-Related Economies, Margins, and Double Marginalization

Historically, costs have figured prominently in discussions of the "make or buy" decision found in the trade literature on advertising services (Newton 1965, Stiglin 2009). Can advertisers operate an in-house agency at a lower cost than that required to retain an outside agency? To address this question, we focus on the costs of the *primary* functions performed by a full-service advertising agency: creative services, production services, and media services.[2]

Consider the total cost (C_o) of a campaign for an advertiser who employs an advertising agency.

$$C_o = K_o + \Delta K_o + P_o + \Delta P_o + B_o + \Delta B_o + M_s + \Delta M_s \qquad (1)$$

where: K_o = agency's cost of creative services; ΔK_o = margin agency charges for creative services; P_o = agency's cost of production services; ΔP_o = margin agency charges for production services; B_o = agency's cost of media buying services; ΔB_o = margin agency charges for media services; M_s = cost to media supplier of time and space; ΔM_s = margin media supplier charges on media purchased by agency for advertiser's campaign. Next, consider the total cost of a campaign (C_h) for an advertiser that integrates the services needed to plan, produce, and implement an advertising campaign.

$$C_h = K_h + P_h + B_h + M_h + \Delta M_h \qquad (2)$$

where: K_h = cost of in-house creative services; P_h = cost of in-house production services; B_h = cost of in-house media buying services; M_h = cost of media space and time purchased directly from media supplier; ΔM_h = margin media supplier charges on media purchased directly by in-house agency.

An advertiser has an incentive to internalize advertising services when costs are lower, that is, when $C_h < C_o$:

$$(K_h + P_h + B_h + M_h + \Delta M_h) < (K_o + \Delta K_o + P_o + \Delta P_o + B_o + \Delta B_o + M_s + \Delta M_s) \quad (3)$$

One argument often made in favor of establishing an in-house agency stresses the potential cost savings realized by avoiding the margins an outside agency charges over and above the costs incurred in supplying the services (terms ΔK_o, ΔP_o, and

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[2] Additional service components (e.g., marketing research, public relations, etc.) can be added to the cost models (1) and (2) without changing the conclusions discussed below about the comparative costs of in-house and outside production.

ΔB_o in (3)). Internalization further eliminates "double marginalization" (Spengler 1950, Rey and Verge 2008), which involves these three agency margins plus the margin demanded by the media supplier (ΔM_s). In the vertical relationship, where an advertiser engages an outside agency and the agency buys space and time from a media supplier, both the agency and the media supplier demand margins over and above their costs. In setting their margins, both ignore the negative consequences of their actions on the other's profits in that an increase in either margin reduces the overall demand for advertising services, and thus, each "inflates" their respective margin (Horsky 2006). Hence, the advertiser has an incentive to internalize the agency's functions and negotiate with the media provider directly.

In addition to the above reasoning on *margins* (that they are smaller on the left side of (3)), the magnitude of the *cost terms* in inequality (3) need to be considered: $(K + P + B + M)$. Scale-related cost economies are available to an external agency through pooling the demands from many different clients. If those are substantial, the reverse of (3) may hold, such that $C_h > C_o$, and the use of an outside agency becomes *less* costly than operating an in-house agency. Prior research has shown that advertising agency operations are indeed subject to significant scale and scope economies. Silk and Berndt (1993) estimated the minimum efficient size of an advertising agency and observed that, in 1987, each of the 100 largest national advertisers had expenditures that exceeded that estimated size, yet less than 5% of them operated an in-house agency. Schmalensee et al. (1983) concluded that larger agencies tended to have not only more accounts, but also larger accounts, than smaller agencies. Larger agencies are in a stronger bargaining position with media suppliers, enabling them to capture size-related economies associated with larger purchases of media space and time. This effect could lead to $(M_s + \Delta M_s) < (M_h + \Delta M_h)$. In addition, agencies having more accounts realize size-related economies with respect to other services that may result in $(K_o + P_o + B_o) < (K_h + P_h + B_h)$. When negotiating compensation agreements, large advertisers are in a stronger bargaining position than smaller advertisers to capture the size-related cost economies available to independent agencies.

Overall, vertical integration is expected to be more likely among small advertisers seeking to avoid margins and double-marginalization than among large advertisers seeking size-related economies. Thus, we hypothesize that the greater the volume of advertising services demanded by a client, the greater the scale-related cost advantage of an external advertising agency serving multiple clients, and the less the likelihood of vertical integration.

H1: The greater the level of mean advertising expenditure per advertiser in an industry, the less the likelihood of vertical integration into advertising services.

Our hypothesis assumes that advertisers who want cost economies can find an agency large enough to gain savings from scale and extract some of those savings for themselves. Prior research supports both points. Historically, the advertising industry has been very competitive, consisting of many agencies of varying sizes, of which most are able to realize cost economies (Schmalensee, Silk and Bojanek 1983, Silk and Berndt 1993). Silk and King (forthcoming) analyzed advertising agency concentration levels using Census data from 1982–2007 and found that the Hirschman-Herfindahl Index was within the range defined by the U.S. Department of Justice as indicative of a competitive industry. A very competitive market may suggest that some of the cost savings would be passed through to advertisers.

2.2   Transaction Cost Analysis (TCA)

In comparing the costs of inequality (3), transaction costs must be considered in addition to production costs (margins and scale efficiency). Evaluation of transaction costs can clarify further why advertisers in certain industries find it advantageous to internalize as compared to firms in other industries. As first proposed by Coase (1937), firms will integrate activities when the costs of organizing them internally is less than the costs of using the market. Williamson (1975, 1985, and 1996) extended that proposition by elaborating transaction cost analysis (TCA) so as to address a set of governance problems encountered when transactions are conducted externally. When the costs of addressing these governance problems are sufficiently high to offset any advantage with respect to production costs available to an external supplier, a firm will opt for vertical integration.[3] We now apply these concepts to advertising services.

While the application of TCA to account for the governance structure of advertising services has often been advocated (Anderson and Weitz 1986, Ruekert et al. 1985, Taplin 1963), only Pope (1983) has actually done so. He applied Williamson's (1975) theory of transaction costs to the evidence on the historical development of the U.S. advertising industry. Applying TCA's constructs of "complexity, uncertainty, and opportunism" to conditions in the U.S. advertising industry in the dawn of the 20th century, Pope argued that TCA implies that "the work that advertising agencies did would seem to be a prime condition for internalization by **heavy users** of advertising. Almost all of the conditions for high market transaction costs were present; few, if any, of the compensating benefits of market arrangements obtained" (p. 146, emphasis added). However, that prediction was at odds with the historical facts: "…between the 1890's and

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[3] See David and Han (2004), Geyskens et al. (2006), and Macher and Richman (2008) for reviews of empirical research on transaction cost economics.

the 1920's, independent agencies become the suppliers of advertising services to virtually all important national advertisers" (p. 147). Therefore, advertising services represent a case where TCA theory that "market arrangements will be superseded when they are more costly than administrative coordination, **may not hold**" (p. 152, emphasis added).

Whereas Pope interpreted TCA to predict internalization by **large** advertisers, we drew upon production cost theory to develop H1 to predict the opposite: a *negative* association between advertiser size and internalization. In what follows, we take advantage of developments in TCA subsequent to the time of Pope's provocative rejection of Williamson's early formulation of TCA and analyze how asset and temporal specificity affect internalization of advertising services.

Williamson (1985) maintained that "the most critical dimension for describing transactions is asset specificity," defined as "durable investments that are undertaken in support of particular transactions, the opportunity cost of which investments is much lower in best alternative uses or by alternative users should the original transaction be prematurely terminated" (p. 55). Of the various types of asset specificity recognized in TCA, human asset specificity is the most relevant in the present context because two-thirds to three-quarters of an advertising agency's total costs are labor-related (Silk and Berndt 1993).

A specific human asset exists in the account team formed within an agency to serve a client. Such teams consist of personnel from various areas of expertise who interact with client employees in planning, developing, and producing campaigns. In carrying out their tasks, agency personnel acquire specialized knowledge about the client's products, markets, strategy, and organization. Part of the specialized knowledge obtained by agency personnel in the course of working with a client relates to conditions that prevail in the particular *industry* where the client operates. Hence, the value of the specialized human assets that resides with an account team consists of both *client-specific* and *industry-specific* components.[4] That the value of specialized human capital contains industry-specific as well as client-specific elements is indicated by several agency practices. Agency personnel typically serve on accounts of more than one client and are highly mobile over the course of their careers, moving not only between agencies but also from agency to client organizations (Broschak 2004). Recognition that human assets have a high value when redeployed to another account in the same industry is reflected in the longstanding norm that prohibits an agency from serving a current client's competitor. The exclusivity agencies grant is customarily limited to a single product category or industry, and

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[4] The multidimensionality of asset specificity has been recognized in other TCA research; see Anderson (1988).

agency-client contracts generally include a clause that defines conflict explicitly by delineating the bounds of competition (Stone 1989).

The duration of agency-client relationships is highly variable, from months to decades; long-term contracts are rare. Without long-term contractual safeguards or the freedom to employ industry-specific or product-specific knowledge concurrently on accounts of competing clients, agencies may under-invest in specialized knowledge. By offering relatively greater security of employment to in-house personnel, integration may induce higher investments in specialized knowledge.

Advertising Intensity and Human Asset Specificity. It has long been observed that differentiated products tend to be more heavily advertised than relatively undifferentiated ones, and thus advertising intensity (ratio of advertising expenditures to sales revenue) is often used as a proxy for the importance of product differentiation in competition (Comanor and Wilson 1974). As discussed above, the development and production of advertising campaigns involves outlays for nonstandard campaign-specific inputs generated by account teams. More differentiation is likely to require more transaction-specific investment (Dyer 1996, Lajili et al. 2007). Taking advertising intensity as a proxy for transaction-specific investments made to build differentiation (Levy 1985, Gatignon and Anderson 1988), we hypothesize integration of advertising services and advertising intensity to be positively related.

H2:   The greater the intensity of advertising, the greater the investment in client-specific human assets required to develop and produce advertising campaigns and the greater the likelihood of vertical integration of advertising services.

Technological Intensity and Human Asset Specificity. Most business transactions involve some specialized knowledge, but the potential gains from specialized knowledge are likely to be largest in technology industries. Williamson (1985, p. 294) noted, "A more harmonious and efficient exchange relation - better disclosure, easier reconciliation of differences, more complete cross cultural adaptation, more effective team organization and reconfiguration - predictably results from the substitution of an internal governance relation (integration) for bilateral trading under those recurrent trading circumstances where assets, of which complex technology transfer is an example, have a highly specific character." Lodish (1983) made a similar point with respect to performing the advertising functions required for campaigns involving specialized technical products.

In practice, Kahn (1986) suggested that advertising professionals typically have experience in consumer marketing, and the knowledge and skills acquired

there tend not to be transferable to the development and execution of advertising programs for complex, technology-based industrial products. Probably the best-known in-house agency was operated by General Electric (GE) for more than half a century, offering a wide variety of communications services to the firm's diverse businesses (Burnside 1991). One motive for GE's in-house agency was the technological sophistication of its products. Thus, in the case of technologically intensive industries, vertical integration into advertising services is likely to protect human-asset-specific investments.

H3: Vertical integration into advertising services is more likely in technologically intensive industries.

Retailing and Temporal Asset Specificity. Another type of asset specificity is "temporal specificity" that arises "when timely responsiveness by on-site human assets is vital" (Williamson 1996, p. 106). Some assets require timely but sequential performance by both transacting parties, thus creating a window for opportunism. The transaction between advertiser and advertising services provider may be subject to high temporal asset specificity in particular industries. After cost savings, "speed" is the second most common reason given for maintaining an in-house agency (Stiglin 2009).

Temporal asset specificity is especially important in retailing. Some advertising programs are undertaken to build image or reputation, while others are intended to attract consumers to stores. The latter emphasizes price and availability of merchandise (Lal and Matutes 1994). Coordination both internally (within a retailing organization) and externally (with vendors and advertising service providers, including local media) is crucial to the effectiveness of such programs. Failure to execute advertising to attract consumers promptly can undermine its impact. By removing the boundary separating retailer and agency, integration can improve coordination and reduce transactions costs.

H4: Vertical integration into advertising services is more likely in retailing.

Creative Industries and Transaction Similarity. Coase (1937) first proposed the concept of "transaction similarity," arguing that the cost of internal organization would increase with the "dissimilarity" of transactions. Masten et al. (1991, p. 8) further advanced the hypothesis that "transactions that are similar to ones in which the firm is already engaged are more likely to be integrated." Advertising services are similar to Caves's (2000) concept of a "creative industry" possessing "bedrock" properties that differentiate them from other

economic sectors.[5] Advertising agencies are commonly described as "idea" businesses (Backer 1993), and creativity in advertising is the elusive quality prized by agencies and sought by clients in their ongoing search for "breakthrough" advertising. Organization theory has long emphasized that the type of organization structure that enhances creativity and innovation differs from that designed to facilitate efficiency, requiring different control and reward systems (Tushman and O'Reilly 1997, Amabile 1998). Concern about an in-house agency's ability to attract and retain creative personnel is often expressed in discussions about the viability of such operations found in the trade press. For example, the chairman of Procter & Gamble (P&G), a leading manufacturer of consumer goods, informed shareholders during the wave of agency mergers in the mid-1980s that P&G had considered acquiring an advertising agency. The idea was rejected on the grounds that it was unlikely that an in-house operation could match the creativity of external agencies (Alter 1986). In contrast, two of the advertisers reported by Tellis (1998) as operating in-house agencies, Benetton and Calvin Klein, are leading manufacturers of fashion-oriented clothing with a reputation for creativity.

Thus, in industries where creativity is critical to their core business, firms may engage routinely in transactions similar to those related to advertising activities. By internalizing advertising services, such firms may exploit economies of scope as a result of past investments made in human assets and management systems, reducing transaction costs below those of outside agencies.

H5:   Vertical integration into advertising services is more likely in creative industries.

3   DATABASE AND ECONOMETRIC METHODOLGY

A cross section of industries is an attractive design for testing hypotheses about vertical integration when variance in the structural determinants of integration can be observed for industries presumed to be in long-run equilibrium (Caves and Bradburd 1988).[6] Our hypotheses are formulated at the industry level, and the data analyzed consists of two annual observations (1991 and 1999) for a cross

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[5] Caves emphasizes: "creative goods and services, the processes of their production, and the preferences or tastes of creative artists differ in substantial and systematic (if not universal) ways from their counterparts in the rest of the economy where creativity plays a lesser (if seldom negligible) role" (2000, p. 2).

[6] Other studies of vertical integration using inter-industry analysis include Balakrishnan and Wernerfeldt (1986) and Levy (1985). Also see Hubbard (2008) on the contribution of cross-industry studies for studying firm boundaries.

section of 69 manufacturing and service industries, as defined by two-digit SIC categories.[7] The 1991 and 1999 cross sections comprise a balanced panel and permit assessment of the stability of results over time, while controlling for unobserved industry factors that remained fixed over this time period.[8]

Demand for advertising is cyclical (Silk et al. 2002 and references cited there), and shifts in the use of in-house agencies have sometimes been attributed to the business cycle (Haase et al. 1934, Loomis 1972). The years 1991 and 1999 bracket a business cycle in the U.S. economy as a whole, as dated by the National Bureau of Economic Research (2005). The downturn occurred in the advertising industry in 1991, when for the first time in four decades, total U.S. advertising expenditures declined. Expenditures grew steadily for the remainder of the decade until 2001 when another decline occurred.

3.1   The Data and Variable Definitions

The source of information is the Standard Directory of Advertisers (SDA, 1992, 2000), which reports the names of agencies employed by advertisers (in 1991 and 1999, respectively) and distinguishes between in-house and independent agencies. The SDA includes other information about advertisers, including SIC industry code, total advertising expenditure, and sales revenue. The SDA collects data via a standardized questionnaire mailed to respondents within advertiser organizations. The key variables we use were operationally defined as follows:[9]

SVI_{it} = Share of the total number of advertisers in industry i reporting any use of in-house agency in year t, $0 < SVI_{it} < 1$. i = 1,2,…,69. t = 1991 or 1999

NUN_{it} = Number of advertisers in industry i in year t

ADX_{it} = Mean advertising expenditure per advertiser in industry i during year t (000's constant \$1991)

ASR_{it} = Mean advertising intensity per advertiser in industry i during year t, ratio of advertising expenditures to sales revenue, as a percentage (both series deflated to constant \$1991)

TECH = Dummy variable to denote a technological industry, as defined in Table 1

RETL = Dummy variable to denote a retailing industry, as defined in Table 1

CRET = Dummy variable to denote a creative industry, as defined in Table 1

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[7] Two-digit SIC categories excluded were government (#43 and #91–96), wholesale trade (#50–51), legal (#81), and miscellaneous services (#88–89).

[8] Schmalensee (1989) draws attention to the bias that may arise from a study of a single cross section observed at one point in time when departures from long-run equilibrium are correlated with the independent variables.

[9] In our analysis, monetary variables are expressed in constant \$1991. Advertising series were deflated using the McCann-Erickson cost-per-thousand-exposures indices. All other series were deflated using the GDP implicit price deflator.

Using data in the SDA, we identified those advertisers who reported use of an in-house agency and then calculated the share (SVI_{it}) of all advertisers (NUN_{it}) in a given SIC industry (i) and year (t) operating an in-house agency, whether the scope of services offered in-house was limited or extensive. $1-SVI_{it}$ is the share of advertisers who relied entirely on external agencies. As reported in the summary statistics (Table 2), both cross sections exhibit considerable variability across categories with respect to vertical integration share (SVI), advertising spending (ADX), and advertising intensity (ASR).

Table 1
Assignment of SIC Industries to Sectors and Definitions of Dummy Variables

Industry Sector	SIC Number	Name
Technology (6)	28	Chemical & Allied Products
TECH = 1, 0 otherwise	35	Industrial Machinery & Equipment
	36	Electronic & Other Electric Equipment
	37	Transportation Equipment
	38	Instruments & Related Products
	73	Business Services
Retail (8)	52	Building Materials & Garden Supplies
RETL = 1, 0 otherwise	53	General Merchandise Stores
	54	Food Stores
	55	Automotive Dealers & Service Stations
	56	Apparel & Accessory Stores
	57	Furniture & Home Furnishings Stores
	58	Eating & Drinking Places
	59	Misc.
Creative (6)	23	Apparel & Other Textile Products
CRET = 1, 0 otherwise	25	Furniture & Fixtures
	27	Printing & Publishing
	48	Communications
	78	Motion Picture Services
	87	Engineering & Management Service

Table 2
Summary Statistics (n = 69 SIC Categories)

Statistic	Share Vertically Integrated (%)		Number of Advertisers		Advertising Expenditures ($000)		Advertising/Sales Ratio (%)	
	SVI91	SVI99	NUN91	NUN99	ADX91	ADX99	ASR91	ASR99
Mean	.423	.507	138	225	16,112	8,228	2.494	1.708
Median	.435	.535	67	114	12,414	6,612	2.107	1.296
Max	.833	.750	1,008	1,582	87,278	49,150	8.267	9.147
Min	.167	.167	5	4	373	213	.071	.059
Std. Dev.	.116	.126	185	293	15,139	7,707	1.867	1.541
Coefficient of Variation	.274	.249	1.338	1.299	.940	.937	.749	.902

The SDA claimed coverage of U.S. advertisers with minimum annual advertising expenditures of $75,000 in 1991 and $200,000 in 1999 ($142,000 in constant $1991). The number of advertisers for which agency, advertising expenditure, sales revenue, and SIC information was available was 9,527 in 1991 and 15,548 in 1999. Collectively, advertising expenditures reported by these firms amounted to $65.45 billion for the 1991 sample and $100.98 billion for the 1999 sample (or $71.82 billion in $1991). These amounts represent 50.7% and 46.7% of total advertising expenditures reported by all U.S. corporations in 1991 and 1999, respectively, as measured by the IRS Statistics of Income (1991, 1999) from corporate tax returns. Those percentages apply to all SIC categories and therefore understate the share of total advertising accounted for by all firms comprising the set of 69 SIC industries we investigate.[10]

It bears noting that the SDA is recognized in the advertising industry as the most comprehensive listing of advertisers available. Furthermore, the share of total U.S. advertising expenditures contributed by national, as opposed to local, advertisers (serving geographically limited markets), has varied cyclically, from 55–66 %. Taken together, these considerations suggest that our database

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[10] We are unable to make like-for-like comparisons between our SIC industries and the IRS data since the IRS does not publish advertising expenditures for all SIC categories.

captures the vast majority of large national advertisers and a substantial but variable proportion of small/local advertisers. The information reported in the SDA tends to be more complete for larger advertisers, and this tendency appears more pronounced in 1991 than in 1999. While the number of advertisers included in the 1999 SDA was 60% greater than in 1991, this expanded coverage captured comparatively more small advertisers than was the case in 1991. This diagnosis is consistent with the summary statistics presented in Table 2, which show that values of the mean, median, maximum, and minimum levels of ADX for 1991 all exceed those for 1999 (in constant dollars).

Across all SIC industries, the weighted (by number of units within each industry) share of all units classified as having integrated advertising services, partially or fully, was 43.26% in 1991 and 53.38% in 1999 (see Appendix for shares by 2-digit SIC.) Surprisingly, about half of all advertisers had internalized at least some advertising services. The above levels of SVI are in line with the level of in-house agency usage found in a recent ANA (2008) study that reported 42% of 195 member companies (major U.S. national advertisers) operated an in-house agency.[11] The vertical integration shares for the common SIC categories co-vary moderately across the two years ($r = .541$), with the shares for 57 of the 69 SIC categories being larger in 1999. As shown in Table 2, for both years, the magnitude of SVI varies widely across industries (from .167 to .75 or more), but the standard deviations of the two distributions are very similar (.116 and .126). Turning to the two advertising variables, the medians and standard deviations for both ADX and ASR are greater for the 1991 cross section than for its 1999 counterpart. The relative dispersion (as indicated by values of the coefficients of variation) of ADX is nearly identical for the two years, except for ASR, where the coefficient of variation is greater in 1999. Across the 69 industries, the inter-temporal correlation between 1991 and 1999 values of ADX and ASR is high ($r = .725$ for ADX and $r = .779$ for ASR).

Checking for collinearity among the advertising variables, Tables 3a and 3b show that the pairwise correlation between ADX and ASR (log transformed) is minimal and essentially the same for both years: .194 for 1991 and .233 for 1999. As predicted by H1 and H2, the correlation between logit SVI and log ADX is negative and between logit SVI and log ASR is positive. Thus, if we find support for H1 and H2, it is unlikely to be an artifact of collinearity between the two advertising variables.

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[11] The 42% penetration level reported in the ANA study refers to the operation of any in-house agency and hence is equivalent to the measure used in the present work in that varying levels of internalization are included. The question asked in the ANA study was: "Does your company have an in-house agency? That is, a department, group or person that has responsibilities that typically are performed by an external advertising or other marcomm [sic] agency."

Table 3a
Correlation Matrix for 1991 Variables
(n = 69 SIC Categories)

	Logit SVI91	LADX91	LASR91	TECH	RETL	CRET
Logit SVI91	1.000					
LADX91	-0.267	1.000				
LASR91	0.461	0.194	1.000			
TECH	0.077	0.010	0.045	1.000		
RETL	0.054	0.259	0.237	-0.112	1.000	
CRET	0.080	0.011	0.121	-0.095	-0.112	1.000

Table 3b
Correlation Matrix for 1999 Variables
(n = 69 SIC Categories)

	Logit SVI99	LADX99	LASR99	TECH	RETL	CRET
Logit SVI99	1.000					
LADX99	-0.260	1.000				
LASR99	0.126	0.233	1.000			
TECH	0.109	0.035	0.107	1.000		
RETL	-0.022	0.250	0.264	-0.110	1.000	
CRET	0.250	0.118	0.142	-0.094	-0.110	1.000

Three hypotheses relate to particular industry types: technological, retailing, and creative. For each, we set criteria for inclusion and then identified the two-digit SICs that satisfied the criteria, using a separate dummy variable for each industry. The composition of each of the three industry groups is shown in Table 1.

As discussed earlier, *technology industries* are associated with human asset specificity. Guided by information on R&D intensity (National Science Foundation (NSF) 1991), we assigned six SIC categories (Chemical Products, Industrial Machinery, Electronic Equipment, Transportation Equipment,

Instruments, and Business Services) to the technology group. The first five industries spent above-average amounts on R&D, measured as a percentage of sales. Since the NSF data covers only manufacturing industries, we added "Business Services," a category that includes software development as a major component. The *retailing sector* is readily identified in the SIC classification and contains the 8 SIC categories listed in Table 1.

Throsby (2001) defined "cultural goods and services" as those that "involve creativity in their production, embody some degree of intellectual property and convey symbolic meaning" (p. 112). Caves (2000) referred to "creative" industries as those "supplying goods and services that we broadly associate with cultural, artistic, or simply entertainment value" (p. 1). Howkins (2001) listed a set of "core creative industries" that produce intellectual property in the form of patents, copyrights, trademarks, and proprietary designs. Relating these definitions of *creative industries* to SIC categories, we identified four industries that involve the creation of intellectual property (Apparel, Furniture, Printing, and Engineering Services) plus another pair that are communications media (Communications and Motion Pictures). The activities of this second set of industries include two major advertising services, message creation and media placement.

3.2   Model Specification and Estimation

We use a logistic regression model to test our hypotheses. The dependent variable of interest, SVI_i, is the share of the advertisers in an industry who use some integrated advertising services rather than relying solely on outside agencies. Since the observed SVI_i represent grouped data, the values of which fall within the interval 0 and 1, we apply the logit transformation to the SVI_i proportions. The full model used to test jointly the five hypotheses presented earlier is specified as:

$$\text{Log}\{SVI_{it}/1-SVI_{it}\}=\alpha_t+\beta_t LADX_{it}+\gamma_t LASR_{it}+\theta_{1it}TECH+\theta_{2it}RETL+\theta_{3it}CRET+\varepsilon_{it},$$
$$t = 1991, 1999; i = 1, 2, \ldots, 69 \text{ industries};\qquad(4)$$

where LADX and LASR are the natural logarithms of the advertising expenditure and advertising intensity variables, respectively. The logit transformation (Ashton 1972) of SVI allows for possible non-linear effects.[12] TECH, RETL, and CRET are dummy variables representing the sectors defined in Table 1; ε_{it} is a random disturbance term; and α, β, γ, and the θ's are parameters to be estimated. Parameters of equation (4) were estimated by pooling observations for the two cross sections, treating the two advertising variables as exogenous. The estimation was carried out via EVIEWS5 (2004) using generalized least squares (GLS).

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[12] RESET tests (Ramsey 1969) gave no indication of model functional form misspecification.

Pooling permits estimation of fixed effects and allows for cross section–specific hetereoskedasticity.[13]

Cross section–specific parameter estimates for the five hypothesized regressors in (4) are presented in columns (1) and (2) of Table 4. Also shown are robust (heteroskedasticity-consistent) estimates of the standard errors of the parameters (White 1980). Wald tests were then conducted to test the null hypothesis that the coefficient estimates for each regressor were equal for both cross sections. Based on the outcomes of those tests, we then estimated a mixed model, where the coefficients are either cross section–specific (unequal parameters for 1991 and 1999) or common (1991 and 1999 parameters set to be equal). The mixed-model estimates are shown in columns (3), (4), and (5) of Table 4. The adjusted R^2 statistics indicate that model (4) accounts for about 30% of the total variance in the logit dependent variable (LSVI). Standard deviations of LSVI are of similar magnitudes for both cross sections, .520 (1991) and .540 (1999). The estimated fixed effects are significant for the mixed-model specification.

3.3   Results: Advertising Expenditure and Intensity

The estimated coefficients for log mean advertising expenditures/firm (LADX) have the expected negative sign and remain relatively stable (within one standard error) in both the cross section–specific and mixed specifications. Using one-tail tests to assess our directional hypotheses, two of the estimated coefficients are significant at the .001 level and the third is almost significant at the .01 level. Consistent with H1 and contradicting TCA, vertical integration share decreases monotonically across industries as log mean advertising expenditure/firm increases.

Turning to advertising intensity (LASR), we find that the estimated coefficients have the expected positive sign but differ in magnitude; the 1991 estimate is much larger than that for 1999. For the mixed model, the estimated coefficient for 1991 is significant at the .001 level while that for 1999 is almost significant at the .10 level. Thus, these results support H2; vertical integration increases monotonically as advertising intensity, our proxy for human asset specificity, increases.

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[13] Equation (4) was also estimated as a system of two seemingly unrelated regressions (SUR). SUR estimates led to conclusions similar to those discussed below for the pooled estimates with respect to the tests of the five hypotheses.

Table 4
Pooled GLS Estimates of Logistic Regression Model of Share of Units with In-House Advertising Services

	Estimated Regression Coefficients N = 138 (Standard Error/Ratio of Coefficient to Standard Error)[*]				
	Full Model: All Cross Section–Specific Coefficients		Mixed Model: Common & Cross Section–Specific Coefficients		
Variable	(1) 1991	(2) 1999	(3) 1991	(4) 1999	(5) Common ('91='99)
Advertising Variables					
ln(ADX) **H1**	-.183[c] (.073) (2.502)	-.196[b] (.087) (2.244)	---	---	-.188[c] (.060) (3.147)
ln(ASR) **H2**	.278[c] (.065) (4.281)	.066 (.059) (1.287)	.277[c] (.067) (4.152)	.069 (.054) (1.265)	---
Ind. Dummy Variables					
Technology **H3**	.105[a] (.079) (1.334)	.268[c] (.109) (2.458)	.109[a] (.076) (1.432)	.261[c] (.105) (2.498)	---
Retail **H4**	.062 (.191) (.326)	.127 (.179) (.713)	---	---	.090 (.165) (.543)
Creative **H5**	.057 (.122) (.469)	.559[c] (.143) (3.893)	.062 (.118) (.522)	.549[c] (.138) (3.982)	---
Fixed effects[+]	+/- .217 (.486) (.447)		+/-.161[c] (.050) (3.253)		
Intercept	1.406[c] (.557) (2.526)		1.395[c] (.551) (2.532)		
Weighted Statistics R² (adj.)	.304		.315		
Std. Err. Est.	.473		.470		
Residual Corr.	.411		.411		

[*]Heteroskedastic-consistent covariances and standard errors.

[+] The reported coefficient is the sum of the fixed effects when all fixed effects across both time periods are constrained to sum to zero. To illustrate, for the full model the sum of industry fixed effects in 1991 is -.217, and in 1999 is +.217. For the mixed model, the sum of industry fixed effects in 1991 is -.161, and in 1999 is +.161.

[a] $p < .10$ [b] $p < .05$ [c] $p < .01$ (one-tail tests)

To investigate whether the advertising variables may be jointly determined along with the share of vertically integrated advertisers, we developed a set of instrumental variables (IVs), and then conducted tests for endogeneity (Hausman 1978). Our instruments were taken from a different data source, compiled from IRS data on individual corporate tax returns and reported as aggregate amounts across firms for two-digit SIC categories. The IRS data used for instruments essentially represent corporate population totals for the various SIC categories and thus can be distinguished from the measures of ADX and ASR that were obtained from the Standard Directory of Advertisers. In addition to lagged values of ADX and ASR as measured by the IRS data, three additional IVs were obtained from this source: percentage gross margin (GMR; business receipts minus costs of sales and operations divided by business receipts); percentage net income (NIR; net income as a percentage of business receipts); and mean income tax (MTX). GMR approximates the Learner price-cost margin that is often used as an indicator of product differentiation. NIR is a measure of profitability; theory predicts and empirical studies confirm that advertising intensity is positively related to average industry profits. Finally, the income tax (MTX) a firm pays is related to its profitability, but the rate at which corporate income is taxed is determined exogenously. To reduce any correlation between instruments and the disturbance term in model (4), values of all IVs were lagged two years, given that studies of advertising budgeting practices indicate that it is commonplace for advertisers to begin with last year's budget and then adjust that level according to expectations about the coming year (Farris and West 2007).

The Hausman test supports the conclusion of exogeneity of ADX and ASR. For each cross section, the results from the Hausman test show that the null hypothesis of exogeneity for ADX and ASR could not be rejected (1991: $\chi2 = 2.123$, df = 2, $p = .346$; 1999: $\chi2 = 3.985$, df = 2, $p = .136$). We conclude that the advertising variables and vertical integration share are not jointly determined.

3.4   Results: Industry Sector Dummy Variables

Hypotheses H3-H5 relate to the technological, retailing, and creative sectors, each sector represented by a dummy variable. Across specifications, the estimated coefficients for the three dummy variables all have the expected positive sign but differ in statistical significance. Results for TECH indicate consistent support for H3; vertical integration of advertising services is more likely in technology industries. The estimated coefficient for TECH is larger for 1999 than for 1991, the former being significant at the .01 level while the latter is significant at the .10 level ($p = .079$).

The results provide only mixed support for H5, that vertical integration of

advertising service is more likely for creative than other industries. The estimated coefficients for CRET have the expected (positive) sign for both years, and the estimate for 1999 is highly significant ($p < .001$). However, the estimate for 1991 is of much smaller magnitude and not significantly different from zero.

We obtain no support for H4, that vertical integration of advertising services is more likely in retailing industries. Although the coefficient estimates for RETL have the predicted positive signs, the test statistics are insignificant. Although the evidence points to rejection of H4, the presence of measurement error in RETL is a plausible rival explanation. The simple dichotomous classification of industries (retail versus all other) clearly fails to capture any inter-industry (or intra-industry) variation in the mix of image and traffic-oriented advertising. Interacting the retailing sector dummy variable with a measure of local (versus regional or national) advertising would provide a more discriminating way to test H4. For similar reasons, it seems likely that the retailing sector is one where hybrid governance structures can be expected, such as local, traffic-building advertising performed in-house with image-oriented national campaigns assigned to external agencies. Pryor (2001, 2002) demonstrated that concentration levels in retailing rose over the period 1971–1997 and suggested that this trend reflects mergers and acquisitions and growth of national chains. These developments may have been accompanied by changes in the mix of national and local advertising employed by retailers that, in turn, have diminished the importance of temporal asset specificity.

Taken together, however, the support for Hypotheses 2, 3, and 5 offer evidence that, contrary to Pope's conclusion, the advertising agency industry is subject to the same forces of transaction costs that have been found to govern the make-or-buy decisions of manufacturers, the domain commonly investigated by TCA (Geyskens et al. 2006, Lafontaine and Slade 2007). Moreover, our results demonstrate the importance of including measures of both production costs (as the support for Hypothesis 1 shows) and transaction costs (as support for Hypotheses 2, 3, and 5 illustrate).

4   MANAGERIAL IMPLICATIONS AND FUTURE RESEARCH DIRECTIONS

Advertisers' interest in vertical integration of advertising services has varied over time (Loomis 1972), but the prospect that firms may once again give serious consideration to integration of advertising services has recently been raised (Douglas 2004). While such a development might appear unlikely in this era of outsourcing of marketing services (McGovern and Quelch 2005), major changes that have occurred or are on the horizon with respect to advertising agency–client

relations provide grounds for suggesting otherwise.

It is informative to view the preeminent place independent suppliers have long occupied within the historical context of how the governance structure of the advertising and marketing services industry evolved in the United States since the mid-19th century. Pope (1983) traced the dominance of independent agencies to the institutional architecture that emerged early in the industry's history. A set of trade practices, known as the "recognition system," effectively prohibited advertisers from purchasing media directly at the same price as agencies, thereby removing an incentive for integration. However, the structure of trade associations that supported the recognition system was essentially dismantled by a 1956 consent decree (Holland 1981), removing the institutional barriers that had long prevented internalizing advertising services and encouraging the gradual abandonment of media commissions in agency compensation and the unbundling of advertising agency services. Thus, an increase in internalization of advertising services in the 1990s implied by this study would be consistent with the evidence of the growth of unbundling reported in Arzaghi et al. (2010).

Currently, the advertising industry is undergoing a major transformation as it absorbs new information and communication technologies that offer not only new media for reaching customers but also new tools for managing campaigns, such as sophisticated economic and statistical methods in the case of online advertising (Evans 2008). Advertisers now find themselves faced with the challenge of coordinating a vast array of independent communication services and suppliers (Draft 2003). A study of chief marketing officers reported that questions about insourcing versus outsourcing are frequently raised in connection with managing the transition from traditional to digital marketing (Busby et al. 2010). There is talk of disintermediation of agencies and other service providers in the face of the expanding activities of internet firms such as Google and Microsoft (Jarvis 2009).

There are also indications that these technological and structural changes are already affecting shifts in production and transaction costs such that existing patterns of vertical relations between advertisers and suppliers of marketing services are also likely to evolve further. Burton (2009) drew attention to the structural differences in the costs of digital and traditional full-service agency services. He estimated the former are "directionally double" those of the latter, when expressed as a share of media expenditures. However, he emphasized that such comparisons based on the widely used metric of "effective commission rates" are inappropriate because the higher relative cost of digital services is offset by lower spending and the greater effectiveness of digital programs. He further noted that the growth of digital advertising has been accompanied by a "shift from external third-party production resources to in-house agency resources," a "blurring of the lines between media, production, and agency services," and the "emergence of new job functions and structures in both agency and client

organizations" (p. 12).

Changes in corporate policies and organization often follow changes in economic and technological conditions. P&G's director of corporate marketing has been quoted as saying: "There's so much inefficiency in the process we create and the agencies create" (Johnson 2003, p. 16). The firm has re-structured its internal brand organization and initiated tests of a new approach to managing relations with its outside suppliers of marketing services (Neff 2007). In 1986, P&G considered but ultimately rejected a proposal to acquire an advertising agency on grounds that the creativity of an in-house operation was unlikely to match that of an independent agency (Alter 1986). But in 2000, the firm established an in-house division that develops and implements word-of-mouth campaigns and serves both internal and external clients (McCarthy 2007).

Given that the present governance structure appears to be in a state of flux, it is an opportune time for industry-specific knowledge to be incorporated into practitioners' decisions relating to the integration of advertising and marketing services, adding to the current focus on issues of incentives, monitoring, and scale. In particular, considerations suggested by this research are discussed below.

First, internalization should be included in the set of policy options considered in the course of conducting agency search and selection processes. Twyon (2006) advocated a disciplined, phased approach to evaluating the full range of options available to clients in making decisions regarding the supply of advertising and marketing services. Our findings indicate that an in-house operation is most likely to be viable for firms competing in creative and technology industries. The introduction of in-house advertising services at Google (Klaassen 2007) and Condé Nast Media Group (Story 2007) are recent cases that reflect this pattern. Study of the practices and experiences of industry competitors may be a source of relevant learning as to the scope and sustainability of alternative governance structures and may reduce the risk of short-lived "mistaken" integration decisions (Williamson 1985).

If a firm chooses to do its own advertising, vertical integration reduces the risk of opportunism, but it does expose the firm to other risks, one of which is financial. Increased fixed assets and fixed spending on the in-house agency might deepen the financial risk to the firm in an economic downturn. Such a risk is unlikely to be decisive when considering integration, however. The largest share of agency operating expenses is personnel costs—but, as is well-known, agency employment is highly sensitive to demand shifts, and so personnel costs can be managed. If anything, a firm that has other lines of business may find it easier to absorb the fixed costs of real estate and other assets than a standalone agency. A second risk is the risk of developing a new competence. Evidence we have cited above suggests that firms will have trouble hiring talented advertising agency personnel due to the (perceived) lack of differentiated or challenging work that is

created by a single firm. This risk is mitigated by increased employment stability, but it will be a managerial challenge to find and attract highly qualified advertising professionals with a narrower scope of products and work.

Second, a detailed cost comparison is required to assess the tradeoff between using an agency versus supporting an in-house operation. Twyon (2006) outlined an approach to comparing the costs of outside and in-house service operations. Client understanding of agency cost behavior has grown as a result of audits conducted in connection with reviews of agency compensation programs. Consulting firms specializing in agency selection and compensation (Beard 2002) have developed databases that might be tapped for information about cost levels and size-related economies.

Two limitations of the methods employed in this study deserve mention and shape future research. First, our measure of vertical integration does not distinguish between "full" and "partial" (or "tapered") vertical integration (Perry 1989). With the shift away from billings-based agency compensation and the growth of holding companies (Silk and Berndt 2004), the unbundling of creative and media services has become more widespread (Arzaghi et al. 2010), increasing the likelihood of partial integration (Horsky 2006). Second, our reliance on sector dummy variables affords only a crude means of inferring inter-industry differences in transaction costs. Here, as in other areas of transaction cost research, more refined measures of transaction costs, asset specificity, and internalization would be desirable (Klein 2005).

5   SUMMARY

Contrary to the widely held impression that use of an in-house advertising agency is more the exception than the rule, we find that vertical integration of advertising services is much more widespread than has hitherto been appreciated: 40% to 50% of all U.S. advertisers in 1991 and 1999 used in-house agencies, with levels varying widely across industries. Both production costs and transaction costs exerted influence consistent with theoretical hypotheses relating to inter-industry differences; smaller advertisers, advertisers of technical products, advertisers of creative products, and advertisers of differentiated products were more likely to integrate. The evidence across two time periods shows that industry differences are important in explaining internalization of advertising services. These results represent an initial step in developing a body of stylized facts that can encourage and support further analysis of vertical relations in the advertising and marketing services industry.

APPENDIX

Incidence of In-House Advertising Agencies by SIC Category: 1991 And 1999

SIC Category	Share of Units With In-House Adv. Agencies		Total No. of Units	
	1991	1999	1991	1999
Agriculture				
01 Production: Crops	0.3774	0.4667	53	75
02 Production: Livestock	0.2500	0.2308	20	26
07 Services	0.4000	0.4828	20	29
08 Forestry	0.4286	0.6154	7	13
09 Fishing, Hunting, & Trapping	0.8333	0.7500	6	4
Mining				
10 Metal Mining	0.1667	0.7222	6	18
12 Coal Mining	0.2222	0.4500	9	20
13 Oil & Gas Extraction	0.2889	0.4643	45	84
14 Nonmetallic Minerals	0.3750	0.4375	24	32
Construction				
15 Gen. Bldg. Contractors	0.4615	0.5522	26	67
16 Heavy Construction	0.5500	0.7105	20	38
17 Spec. Trade Contractors	0.4722	0.6875	36	64
Manufacturing				
20 Food & Kindred Products	0.3411	0.4683	601	854
21 Tobacco	0.4112	0.3704	17	27
22 Textile Mill	0.5133	0.5960	113	198
23 Apparel & Textile	0.5307	0.6976	228	309
24 Lumber & Wood	0.5354	0.6012	99	168
25 Furniture & Fixtures	0.4798	0.6069	173	262
26 Paper & Allied	0.4423	0.5849	104	212
27 Printing & Publishing	0.5539	0.6945	334	586
28 Chemical & Allied	0.4312	0.5441	596	930
29 Petroleum & Coal	0.4151	0.4727	53	110
30 Rubber & Plastic	0.4387	0.5436	253	436
31 Leather	0.4043	0.6090	94	133
32 Stone, Clay, & Glass	0.4370	0.5797	119	207

SIC Category	Share of Units With In-House Adv. Agencies		Total No. of Units	
	1991	1999	1991	1999
33 Primary Metal	0.4470	0.5597	132	268
34 Fabricated Metal	0.4836	0.5638	517	917
35 Ind. Machinery & Equipment	0.4841	0.5518	1,008	1,582
36 Electronic & Electric Equipment	0.4343	0.5607	647	981
37 Transportation Equipment	0.4055	0.5038	291	399
38 Instruments	0.4888	0.6131	446	734
39 Misc. Manufacturing	0.4571	0.5900	326	522
Transport & Utilities				
40 Railroad	0.4667	0.6429	15	14
41 Local Transit	0.4706	0.3529	17	17
42 Trucking & Warehousing	0.4490	0.5068	49	73
44 Water Transportation	0.3214	0.2895	28	38
45 Air Transportation	0.1857	0.3516	70	91
46 Pipelines	0.2727	0.3158	11	19
47 Transportation Services	0.3968	0.5882	63	85
48 Communications	0.2800	0.5073	100	205
49 Utilities	0.2065	0.3500	92	180
Retail				
52 Bldg. & Garden Supplies	0.4894	0.6154	47	78
53 Gen. Merchandise	0.4925	0.5269	67	93
54 Food Stores	0.4321	0.4323	81	155
55 Auto Dealers & Service Stations	0.2326	0.3982	43	113
56 Apparel & Accessories	0.5000	0.4671	78	152
57 Furniture & Home Furnishings	0.5672	0.6140	67	114
58 Eating & Drinking	0.3036	0.3380	168	216
59 Misc. Retail	0.5192	0.5791	208	316
Finance, Insurance, & Real Estate				
60 Depository Institutions	0.2117	0.2053	137	151
61 Non-Deposit Institutions	0.2857	0.3368	63	95
62 Security Brokers	0.3774	0.3684	53	114
63 Insurance Carriers	0.4379	0.4576	153	236

SIC Category	Share of Units With In-House Adv. Agencies		Total No. of Units	
	1991	**1999**	**1991**	**1999**
64 Insurance Agents	0.4222	0.3333	45	63
65 Real Estate	0.4149	0.4877	94	162
67 Other Inv. Offices	0.3209	0.4309	296	543
Services				
70 Hotels	0.3258	0.4231	89	130
72 Personal Services	0.5625	0.4762	32	42
73 Business Services	0.4581	0.5350	382	714
75 Auto Repair & Parking	0.4348	0.5522	46	67
76 Misc. Repair	0.5833	0.6571	12	35
78 Motion Pictures	0.4130	0.6047	46	86
79 Amusement & Recreation	0.2598	0.4312	127	276
80 Health	0.5500	0.6038	20	53
82 Education	0.5918	0.6190	49	63
83 Social	0.5000	0.4348	6	23
84 Museums & Gardens	0.6000	0.1667	5	12
86 Membership Organizations	0.4215	0.5529	121	170
87 Engineering & Management	0.4677	0.5663	124	249
TOTAL: All Categories	**0.4326**	**0.5338**	**9,527**	**15,548**

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