Financial Services Review 8 (1999) 183–197

FINANCIAL SERVICES REVIEW

An analysis of affinity programs: the case of real estate brokerage participation

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Received 5 January 1999; received in revised form 7 July 1999; accepted 18 October 1999

Abstract

In this study, we examine the impact of affinity programs on the residential real estate brokerage market. The results indicate that affinity-participating firms employ more salespeople, operate more offices, are more likely to be franchised, and have more multiple listings service affiliations than their nonparticipating counterparts. We directly test for firm and industry efficiency using a Bayesian stochastic frontier technique, and find strong evidence that non-affinity firms are much more efficient at allocating and utilizing their resources. These findings cast concerns on the industry in light of the growth of affinity programs.

JEL classification: L85; C11

Keywords: Real estate brokerage; Affinity programs; Efficiency

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[1] The work on this paper was started while the author was at Northeast Louisiana University.

1057-0810/00/$ – see front matter
PII: S1057-0810(00)00042-6

1. Introduction

When buying or selling real estate it is common to rely on the services of a residential real estate brokerage firm. In simplest terms, brokerage firms bring together buyers and sellers to conduct real estate transactions in return for a commission. For the individual real estate consumer, brokerage firm efficiency is crucial. If the brokerage industry is efficient, buyers and sellers benefit from reduced search time and low transactions costs. Alternatively, economic theory predicts higher prices and lower quality of services in inefficient markets. Regulators, policy makers, practitioners, and academics continue to spend considerable amounts of time monitoring and analyzing this industry because it impacts so many people. However, evaluating the efficiency of the residential real estate market is difficult because it is changing and evolving so rapidly. We are seeing mass consolidation, leaving fewer yet larger firms in the industry (Zumpano, Elder, and Anderson, 2000).

The structure of brokerage relationships is also changing. Traditionally, the agent represented the seller in real estate transactions. Today, other choices such as a buyer's agent (regular and exclusive) and a disclosed dual agent exist and are growing in popularity. An exclusive buyer's agent works for an office that does not take listings of any kind and represents only buyers and non-agency facilitator arrangements. A regular buyer's agent works in a traditional real estate office that takes listings, but will work with a buyer under contract. Disclosed dual agents represent both the buyer and the seller in real estate transactions and can arise in numerous settings. In addition to traditional Multiple Listing Service (MLS) use, the growth in technology, especially the Internet, is changing the way people shop for homes and the way real estate firms conduct business. These changes are most certainly impacting the efficiency in which the market and industry operates (Anderson, Fok, Zumpano, and Elder, 1998).

In this paper, we examine another change in the industry, the use of affinity programs, and attempt to ascertain how these programs will alter the competitive structure of the market. Affinity relationships provide commission rebates, discounts, and other goods and services to individuals who are members of professional organizations, trade associations, unions, or organizations who have an agreement with a real estate company. The increase in affinity programs over the past few years and the related increase in referral fees are a major concern of the residential real estate brokerage industry (NAR, 1996; Dezube, 1996). Given the increased involvement of the residential brokerage industry with affinity groups and the billions of dollars potentiality at stake, it is not an exaggeration to say that the affinity program issue may become one of the most important developments facing this industry.

In this study, we present the first rigorous empirical investigation of affinity programs on firm and market efficiency using detailed financial data from a national sample of residential real estate brokerage firms. Our analysis into the affinity question proceeds with further discussion on affinity programs within the real estate brokerage industry and a summary of the prior affinity research. Section 3 provides the data that we use along with an analysis of the summary statistics for affinity and non-affinity firms. Section 4 presents the Bayesian stochastic frontier methodology that we use to estimate the efficiency levels by brokerage type, whereas Section 5 presents the efficiency and scale results. Section 6 concludes.

2. Affinity programs: background and prior research

Real estate firms have been in the business of relocation and referral-related residential sales for the past thirty years; however, it is the recent increase in referral fees that is of concern to the residential real estate brokerage industry (NAR, 1996). Thirty years ago the use of referral fees was initiated by brokers who desired to both send and receive prospective customers. For those brokers who received the prospective customer, the referral fee was considered a marketing cost. In fact, Ball (1990) discusses the need to make the most of your referral network and business.

At the time referral fees came into practice, it was rare for transferees to receive assistance from their employer in purchasing a new home or selling their existing residence. During the recession of 1981 through 1983, corporations began offering better relocation benefits to their employees. Also during this time, the use of referral networks extended beyond independently owned, non-franchised firms as referral networks were also established among franchise firms (NAR, 1996).

The use of referral fees has continued to evolve. Now, many corporations and relocation management companies demand such fees. In the past few years, corporations have begun charging referral fees as a means to reduce the skyrocketing expenses associated with relocation. Also aware of rising relocation costs, relocation management companies have begun to charge referral fees in an effort to maintain or improve their profits. Affinity relationships grew out of these relocation and referral networks. Affinity groups are relatively new players in the real estate industry. In 1995, at the Business Issues Committee of the National Association of REALTORS© (NAR), a working group was established to examine industry practices with respect to affinity relationships. (NAR, 1996).

Companies that have established affinity relationships for their employees include the following: United Air Lines, Sears, Roebuck and Company, United Parcel Services, and the Prudential Insurance Co. of America. Among the real estate firms involved in such partnerships are Century 21, Prudential, and Coldwell Banker. The structure of affinity benefits has varied according to the structure of each affinity program and according to state law.

2.1. Potential benefits of affinity participation

Advocates of affinity programs argue that both consumers and brokers benefit. Consumers benefit from reduced brokerage commission fees, and the cost savings on ancillary services associated with loan and property closings whereas brokers reap more business from affinity referrals. Economic theory suggests that bundling real estate services, as could be the case with one-stop shopping arrangements, can result in significant cost savings to consumers from reduced search costs and economies of scale in the provision of bundled services. Reich–Hale (1999) show how this type of bundling of goods and products can be beneficial in the insurance industry. Supporters of such programs also contend that they will tend to reduce real estate commissions for all consumers, whether or not they are members of affinity groups, by increasing overall price competition within the industry. Advocates claim that small firms should benefit more than larger firms should from the affinity groups because larger firms can often

provide ancillary services to consumers cost effectively in-house. Small real estate firms that could not otherwise provide competitive services to their customers can now do so by joining with an affinity organization. Cendant Mobility, the largest of the affinity organizations estimates that their company has paid out more than $20 million in rebates to more than 40,000 customers since 1990 (Agency Law Quarterly, 1998).

2.2. Possible limitations of affinity participation

Opponents of such programs counter that these programs may violate the Real Estate Settlement Procedures Act's (RESPA's) prohibition against rebates, result in double referral fees, and could raise the cost of doing business for real estate professionals and consumers. The Consumer Law Center and the Consumer Federation of Americans, among others, claim that the money rebated to consumers is very small relative to the cost of affinity programs. Participating real estate agents often have to pay affinity companies as much as 30% of their gross commissions in referral fees, very little of which ultimately passes to the consumer (Agency Law Quarterly, 1998).

Imperfections in the market may occur due to imperfect information. Cost reductions resulting from bundled services, rebates, and other goods and services provided by affinity partners may not always be realized. Such savings presuppose that affinity service providers are less expensive than non-affinity competitors. For example, if a consumer receives a $300 rebate from an affinity broker but ends up paying $800 more for a mortgage through an affinity lender, the consumer is obviously not better off. In such cases sales agents, especially if working as a buyer's agents, could violate their fiduciary responsibility to their client if they knowingly send clients to higher priced service providers. However, brokers could be threatened with the loss of future referral by informing customers that their affinity affiliates are more expensive. Such coercion could create serious conflict of interest problems for brokers. For affinity programs to truly benefit the consumer, there must be an incentive structure in place that aligns the best interest of the consumer with the self-interest of all participating service providers, including the broker.

Another complaint against affinity groups is that much of their activities are outside the scope of state regulators and real estate commissions. In fact, the Financial Regulatory Relief and Economics Efficiency Act now before Congress would, if passed, prevent states from prohibiting affinity rebates. At the other end of the spectrum, a number of states, including Maryland, New Jersey, and Mississippi, either prohibit affinity rebates or consider them to be illegal inducements to consumers. Limiting consumers to certain brokers, or alternatively, barring affinity rebates can present some freedom of choice problems, whereas over-riding state regulatory authorities can create some states rights issues.

As the previous discussion indicates, affinity programs presently exist with a certain degree of controversy. However, as noted above, there has been little empirical evidence available to assess the impact of affinity programs on the real estate brokerage industry. In the next section we provide a summary the previous research on the affinity issue.

2.3. Prior empirical research

Surveys in 1996 and 1998 by the NAR questioned brokers as to their perceptions about the impact of affinity programs on their business. The 1996 survey contains 722 useable responses (~7% response rate) from designated REALTORS© across the nation, using a random sampling procedure. The NAR deemed the survey representative of the membership in all four-census regions, and hence conclusions are drawn for the entire population. The survey contains information from responses based on the previous year, 1995. A follow-up 1998 survey contains 635 useable responses (~6% response rate). This follow-up survey is not completely random. In addition to a random sample of the membership, the survey sampled 500 of the leading real estate firms as defined and identified by REALTRENDS. Again the responses are based on the previous business year, 1997. It is important to emphasize that these survey responses do not contain any financial data and are based solely on the opinions of respondents. Moreover, even though the surveys were deemed reliable by the NAR, the response rate is very small, and any conclusions should be interpreted with caution.

The results indicate that affinity participation is increasing, but overall participation remains modest. In particular, the percentage of respondent firms that affiliate with affinity programs has risen from 16% in 1995 to 24% in 1997. McMillan (1997) provides additional support for these results as he suggests that affinity programs are rapidly growing on the East Coast and in California. However, he notes that in some locations the programs are just not catching on, which brings up issues on what settings or circumstances promote affinity affiliation. The results also indicate that once brokerage firms begin an affinity relationship, they usually participate in more than one program. In 1995 approximately 63% of affinity participating firms had more than one affinity partner. That number jumps to 79% of firms having multiple relationships in 1997. The surveys also reveal that brokerages primarily partner with corporations, professional associations, employers, and unions. The NAR reports also note that affinity participation is greatest among the larger real estate companies and franchise firms.

When examining the impact on firm performance, the survey results reveal that most respondents either did not know the impact of affinity programs on the various measures of performance, or that they thought that affinity programs did not impact performance. Only 9% report an increase in agent productivity, and only 10% reported an increase in their firm's listings. We must point out, however, that these responses were not based upon financial or accounting data, but rather, represented the opinions of respondents. Hence, these findings must be interpreted with some caution. Respondents may have had a difficult time isolating the effects of affinity participation on firm performance. The potential positive and negative impact of affinity on the industry and on profitability is further highlighted in Berger (1997).

The surveys also examine potential consumer benefits of affinity programs. The benefits most often take the form of commission rebates, special mortgage financing packages, free goods, and product discounts. Sellers seem to be the principle beneficiaries of commission reductions, whereas buyers most often received financing inducements. In 1997, 76% of the affinity respondents indicated that they offered sellers commission reductions in the form of either a percentage discount (56%) or a fixed dollar discount (20%). Some of these firms

offered commission rebates, although this was not as common as discounts. Buyers were also offered commission reductions, however, offers of special services or goods were far more common. In general, the percentage of respondents offering benefits has increased between 1995 and 1997.

3. Financial data and analysis

As stated previously, to determine the actual impact on firm performance, we need to link affinity affiliation with actual brokerage financial figures and analyze those numbers to determine the implications of affinity relationships on performance. The financial data comes from another survey by the NAR (NAR, 1998). This survey contains 1996 income and expenses data. Professionals who are Certified Real Estate Brokerage Manager designees make up half of the sample with the remainder of the responses coming from a random sample of real estate brokerage firms that are members of the NAR. The information includes the number of real estate listings and sales by each firm, net income, and the firm's cost of listing and selling residential real estate. Additionally, for the first time, the survey contains a variable indicating whether the firm participates in affinity programs and the corresponding costs associated with participation. Following other studies (Zumpano, Elder, and Crellin, 1993; Zumpano and Elder, 1994; Anderson, Fok, Zumpano, and Elder, 1998; Anderson, Lewis, and Zumpano, 2000a; b; and Lewis and Anderson, 1999) that use a similar data source we include only firms who obtain at least 75% of their revenues from residential transactions. The final data set is made up of 176 firms, 92 of which are affinity participants and 85 nonaffiliated firms. The NAR again denotes the sample as reliable and representative of the true population of real estate brokerage firms even though the overall survey has a low response rate at just over 3%. To the best of our knowledge, this sample does represent the only national data set that provides income and expense figures for real estate brokerage firms, thus providing us with the best opportunity to glean insights into the affinity issue on a nationwide basis. Nevertheless, with the relatively small sample size and response rate caution must be exercised when examining and interpreting the results. We deem the results that follow as reliable for the sample set, but defer any generalizations for the population of all brokerage firms for future work with a larger data set.

In Table 1 (Panel A) we examine the firm characteristics of both sample group types. Affinity participants are larger as measured by the number of employees. Affinity firms employ on average 79 salespersons and almost 13 non-sales persons. In contrast, the non-affinity firms in the 1996 sample employ only 22 salespersons and had just fewer than three and a half non-sales employees. Affinity affiliates also tend to have a larger number of offices than their non-affinity counterparts. Affinity firms operated, on average, four more offices than did non-affinity brokers. As with the prior surveys, we find that affinity firms are older (only significantly older at the 0.10 level), more likely to be associated with a franchise and have slightly more MLS memberships. Interestingly, the salespersons in non-affinity firms produce more revenue transactions on a full-time equivalent salesperson basis, indicating more productive employees. However, the difference is not statistically robust.

In Table 1(Panel B), we examine several key financial variables. Noting the size differ-

Table 1
Firm characteristics and financial performance

Panel A: the summary of Firm characteristics: 1996 NAR income and expense survey

Characteristic	Affinities	Non-affinities	*t*-statistic
Number of sales people	79.13	22.24	3.37*
Number on nonsales people	12.70	3.44	3.16*
Number of offices	5.32	1.45	2.52*
Age of the firm	21.24	17.36	1.67
Percent of firms franchised	39%	24%	2.28*
Number of MLS subscriptions	2.52	2.17	3.38*
Revenue transaction per salesperson per year	17.88	22.39	−1.85

Panel B: average financial performance of affinity affiliates compared to non-affinity participants

	Affinities	Nonaffinities	*t*-statistic
Number of listings	544	212	2.75*
Number of sales	563	214	2.61*
Total revenue transactions	1107	426	2.60*
Gross revenues	$4,107,672	$1,270,619	3.12*
Adjusted net income	$245,617	$81,320	2.60*
Gross revenues/revenue transaction	$3,808	$3,573	0.52
Adjusted net income/revenue transaction	$260	$360	−0.36
Percentage of firms experiencing an increase in profitability	49%	41%	1.41

* Denotes that a significant difference between the two sample means at the 0.05 level of significance.

ence in firms with respect to offices and employees, we expect and do find higher levels of listings, sales, total revenue transactions, gross revenues, and total adjusted profits for affinity firms relative to non-affinity firms. Total adjusted profits are simply the firm's net profits plus the distributions taken by the owners. However, when controlling for size effects by examining revenues and profits on a per transaction basis, differences in performance between the two groups disappear. In fact, profits per revenue transaction are actually greater for non-affinity firms than their affinity counterparts, although the difference is not statistically significant. Finally, no statistical difference exists between the percentage of firms in 1996 that experience an increase in profitability. Although not a test of firm and/or market operating efficiency, it seems as if the larger sample affinity firms are able to generate large output numbers, but unable to translate those earnings into higher profits. Hence, for this sample set, affinity programs may help firms grow in size and perhaps gain market share, but may actually be reducing the efficiency in which firms conduct business. We highlight this point by noting that the agents for non-affinity firms actually produce more revenue transactions than their affinity salesperson counterparts.

To formally test for X-efficiency difference in the two groups, we need to understand and define the firm as a production unit. In general, real estate brokerage firms produce revenue transactions (listings and sales). To be X-efficient, the firms must choose the optimal

Table 2
Summary statistics (full sample) for the input prices and firm total costs in logarithmic form[a]

	Mean	Standard deviation
ln (P_{lab})	10.29	1.42
ln (P_{occ})	9.99	1.05
ln (P_{AD})	5.16	0.78
ln (P_{Other})	6.16	0.88
ln (total costs)	13.37	1.61

[a] P_{lab} = prices of labor; $P_{capital}$ = price of physical capital; P_{AD} = price of advertising and promotions; P_{Other} = price other inputs.

Wages of employees are total sales-related expenses plus salaries of all clerical, secretarial, and sales managers' divided by the number of full-time equivalent employees. The rents on physical capital are total occupancy expense divided by the number of real estate offices. Advertising and promotion expenses are expressed as a percentage of revenue transactions. And, "other" inputs are also expressed as a percentage of revenue transactions.

amounts of inputs and the optimal allocations of inputs such that total costs are minimized for a given number of revenue transactions. Total costs consist of commissions paid to selling agents, the value of non-selling services provided by broker-owners, advertisement and promotional costs, the cost of buildings and occupancy, and all other production related expenditures. The selling expenses include multiple listing service (MLS) fees that vary directly with sales, bonuses of sales managers based on sales-staff performance, commissions paid to owners, and commissions paid directly to the sales staff. Within these expenses, the costs of affinity relationships are implicitly included.

The cost function that we define and estimate in the next section expresses total costs as a function of output and input prices. Hence, we convert the inputs of total cost into four input prices. We define the prices of labor (P_{lab}), physical capital (Pcapital), advertising and promotions (P_{AD}) and other inputs (P_{Other}). Wages of employees are total sales-related expenses plus salaries of all clerical, secretarial, and sales managers' divided by the number of full-time equivalent employees. The rents on physical capital are total occupancy expense divided by the number of real estate offices. Advertising and promotion expenses are expressed as a percentage of revenue transactions. And, "other" inputs are also expressed as a percentage of revenue transactions. All of these input prices are expressed in natural log form in the estimated model. As such, Table 2 lists the mean and standard deviation for each of these four input prices and for total cost in natural log form.

4. The efficiency estimation methodology

4.1. The stochastic frontier methodology

We use a stochastic frontier model to estimate firm efficiency and economies of scale. Aigner, Lovell, and Schmidt (1977) and Meeusen and van den Broeck (1977) introduce stochastic frontier model to the finance and economics literature. In essence, the technique

constructs an efficient frontier that represents the minimum total costs that a firm can incur given its outputs and input prices. After constructing the frontier, we then determine how far an individual firm is deviating from efficiency. With a stochastic frontier technique, we decompose deviations into two-components: random error and firm inefficiency. In other words, a firm can deviate from the efficient frontier by either incurring additional costs (inefficiency) or because of measurement error or bad luck, which we consider out of the firms control. The stochastic frontier approach allows us to determine what percentage of the deviation from the frontier is a function of inefficient operations and what portion of the deviation is simply measurement error. We make the common assumption that the random error term is two-sided, and is normally distributed with mean zero and variance, σ^2. In other words, the random error component can either increase or decrease total costs. We assume that the inefficiency component is distributed one-sided (exponentially), such that it can only increase the firm's total costs.

4.2. The stochastic cost frontier

The stochastic frontier approach is parametric, and as such it is necessary to specify a functional form. Following previous efficiency studies for real estate brokerage firms, we utilize use the translog cost function to estimate cost efficiency:

$$\ln TC(P_i,Y) = B_o + \sum_{i=1}^{4} B_i \ln P_i + \sum_{i=1}^{4}\sum_{j=1}^{4} B_{ij} \ln P_i \ln P_j + B_6 \ln Y + B_7 \ln Y^2 + v_i + z_i \qquad (1)$$

where *TC* represents the firm's total cost. *TC(.)* is the actual cost frontier that depends on four input prices, $P_{i,}$ and a single output, $Y_{.}$ z_i and v_i represent a composed or two-part error term. z_i is the non-negative stochastic error term reflecting firm inefficiency, and (v_i), is the symmetric, two-sided error term that captures other deviations from the frontier such as measurement error. We make the usual assumption about the two-sided error term, $v_i \sim IID\ N(0, \sigma^2)$. For the non-negative, one-sided error term, we assume z_i follows an exponential distribution with shape parameter λ that defines both the mean and variance of the exponential distribution. In our analysis, we allow λ to take on two different values, λ_1 for affinity firms and λ_2 for non-affinity firms. This allows for the possibility of different mean inefficiency across the two groups of real estate brokerage firms.

Traditional approaches estimate Eq. (1) by using either a corrected least squares approach or by maximum likelihood. In this paper, we use a Bayesian estimation procedure. With a Bayesian approach, we can use prior information about parameters from economic theory and/or previous studies. Unlike the traditional statistics, in a simulation type procedure, we can calculate the precision of all parameter values, including individual firm efficiency and the returns to scale, by reporting a 90% confidence interval for each parameter. Lastly, the Bayesian technique allows us to estimate group type efficiency under a single efficient frontier. That is, we provide for inefficiency estimates for two groups in our sample under a single cost frontier. This methodology is superior to estimating two separate frontiers—one for affinity firms and another for non-affinity firms because frontiers tend to cross, making it impossible to interpret a single firm's technical efficiency (Refer to Lewis and Anderson, 1999 for a detailed methodological discussion on the advantages of estimating the condi-

tional efficient frontier). Lastly, from the estimated parameters, we compute the odds that affinity affiliated brokerages are more efficient than non-affinity firms.

4.3. Incorporating Bayes rule and the stochastic frontier methodology

In this paper we use Bayes rule to combine our prior knowledge, which we call our prior density function with the knowledge we gather from the data described by the likelihood function to form a posterior density function. The expected value of the posterior density distribution is the weighted-average of the prior density function and the likelihood function. The more variance or uncertainty there is in the likelihood function or the smaller is the observed sample data set, the more emphasis the prior distribution has on the posterior. The more uncertainty associated with the prior density function and the more observed data, more emphasis is given to the data described by likelihood function. In other words, the data becomes more important than priors as the certainty and quantity of the data increase.

4.4. The prior density function

We choose a uniform prior for the frontier's coefficients and the standard error of the model implying that we do not possess any prior knowledge about those parameters. And, as noted above, the inefficiency component of the two-part error term is defined by an exponential distribution with λ_j being the shape parameter that defines the mean of the exponential density function conditional on whether the firm is an affinity member or not. j takes on a value of one if the firm partners in an affinity relationship and a two if the firm is not affiliated with an affinity. As in previous studies we chose a gamma prior for λ^{-1}, and set the prior industry efficiency measure to 0.875.

Monte Carlo integration allows us to derive the posterior marginal density functions that would otherwise be impossible to derive analytically. Using the Gibbs sampler we draw 25,000 observations from the conditional joint probability distribution functions, dropping the first 5,000 iterations to avoid sensitivity to starting values that may occur. We use the observations that we sample to form marginal posterior density functions for each of the model's parameters. From the marginal posterior density functions, we calculate the expected value and 90% confidence intervals of each of the model's parameters, 194 in all.

Economic theory suggests that the cost frontier is monotonically increasing and concave in input prices. Another requirement imposed by economic theory is that the average cost function must be U-shaped. Terrell (1996) demonstrates how to impose these restrictions. Within the prior, we restrict the cost function to be monotonically increasing in input prices. In the translog cost frontier, this implies that the share equations must all be positive.

We also impose the cost frontier to be concave in input prices. To assure that the average cost function is U-shaped within the translog model specified above we restrict the partial derivative of average firm total cost to firm output (revenue transactions) to be greater than or equal to zero at the minimum.

5. The Bayesian results

5.1. The efficiency results

Initially, we estimate the overall sample's inefficiency (λ)using a model that does not distinguish differences in the brokerage type. In other words the stochastic frontier's parameter results do not take into account that there may be differences in the performance of affinity brokerages and non-affinity brokerages. The restricted base results show that sample real estate brokerage firms are approximately 81.5% efficient. These results are consistent with Lewis and Anderson (1999) and Anderson, Lewis, and Zumpano's (2000b) conclusion that brokerages, overall, are relatively efficient. It is also consistent with the findings of Anderson, Lewis and Zumpano (2000a) that firms become more inefficient as the residential real estate markets strengthens. By imposing concavity, monotonicity, and the U-shaped average cost restrictions, the confidence intervals stated are much narrower than if no restrictions had been applied.

Subsequently, we compute efficiency measures contingent upon whether the firm has at least one affinity relationship or not. The results of this estimation are reported in Table 3. We find that the sample firms with at least one affinity relationship are nearly nine times more cost inefficient than firms that have no affinity relationships. With the restricted Bayesian stochastic cost frontier, affinity firms are approximately 35.2% inefficient and non-affinity firms are approximately 4.2% inefficient. This means that the average affinity participating firm in the sample could reduce its input costs by 35.2%, without decreasing output. On the other hand, non-affinity sample firms could only reduce input costs by 4.2% given their level of output. Table 3 also establishes individual brokerage efficiencies for five arbitrary affinity affiliated firms and five arbitrary non-affinity firms. As noted in the table, the first example of the affinity firm shows that the firm is approximately 84.6% efficient, whereas the first example of the non-affinity firm shows that it is approximately 94.7% efficient. Using the posterior marginal density functions constructed using the Gibbs sampler, the probability that affinity firms are more efficient than non-affinity firms is less than one in 20,000. This converts to an odds ratio of 0.00005 to one.

5.2. Economies of scale results

To investigate optimal firm size, we calculate economies of scale from the efficient cost frontiers estimated above. A firm's scale economies are

$$\frac{1}{\partial TC/\partial Y}$$

evaluated at Y, where Y represents output as measured by revenue transactions. A result greater than one suggests the firm is operating at increasing returns to scale, a result less than one states that the firm is operating with decreasing returns to scale, and a result of one indicates the firm is operating with constant returns to scale. We calculate returns to scale two ways. First we use the base parameter estimates where the stochastic frontier does not

Table 3
Conditional efficiency results for affinity and non-affinity firm[a]

Arbitrary brokerage #	Posterior means [90% confidence interval]
Affinity brokerage 1	84.6% [64.3%, 98.7%]
Affinity brokerage 2	45.5% [29.6%, 98.7%]
Affinity brokerage 3	63.3% [42.1%, 88.5%]
Affinity brokerage 4	71.9% [49.3%, 95.1%]
Affinity brokerage 5	71.9% [49.7, 94.8%]
Nonaffinity brokerage 1	94.7% [82.4%, 99.8%]
Nonaffinity brokerage 2	96.3% [88.6%, 99.8]
Nonaffinity brokerage 3	94.3% [81.6%, 99.8%]
Nonaffinity brokerage 4	96.5% [89.4%, 99.8%]
Nonaffinity brokerage 5	96.9% [90.6%, 99.9%]
Affinity group inefficiency (λ_1)	35.2% [27.0%, 44.8%]
Affinity group inefficiency ($\exp(-\lambda_1)$)	70.3% [63.9%, 76.3%]
Non-affinity group inefficiency (λ_2)	4.2% [2.0%, 7.7%]
Non-affinity group efficiency ($\exp(-\lambda_2)$)	95.9% [92.6%, 98.0%]
Relative group type inefficiency $\frac{\lambda_1}{\lambda_2}$	9.74 [4.50, 17.69]
Prob ($\lambda_2<\lambda_2$) = prob $\left(\frac{\lambda_1}{\lambda_2} < 1\right)$	
Probability that affinity brokerages are more efficient	<1 out of 20,000
Odds that affinity brokerages are more efficient	<0.00005 to 1

[a] Industry inefficiency, arbitrary examples of individual brokerage efficiency and the variance of the frontier's measurement error are listed with 90% confidence intervals.

distinguish between types of brokerage firms–ones that participate in affinities and ones that do not participate and the parameter estimates. The next set of estimations the parameter estimates are from the stochastic frontier that is constructed conditional on the two separate firm types; affinity and non-affinity participants. The results from the former are in Table 4 (Panel A) and the results from the latter are in Table 4 (Panel B).

In Table 4 an overwhelming amount of evidence suggests that a majority of the sample firms are operating at increasing returns to scale. Rather than reporting the returns to scale for all firms in the sample we report returns to scale for each quartile of brokerages based on the number of revenue transactions made. Both sets of results show that brokerages in all

Table 4
Returns to scale results

Panel A. scale findings using the restricted base parameter results

Quartile	$1/\partial TC/\partial Y$ [90% confidence interval]	Returns to scale
25^{th} (lny = 4.63)	1.160 [1.077, 1.251]	IRS
50^{th} (lny = 5.38)	1.154 [1.072, 1.245]	IRS
75^{th} (lny = 6.63)	1.147 [1.067, 1.239]	IRS

Panel B: scale findings conditional on firm type

Quartile	$1/\partial TC/\partial Y$ [90% confidence interval]	Returns to scale
25^{th} (lny = 4.63)	1.22 [1.14, 1.30]	IRS
50^{th} (lny = 5.38)	1.21 [1.14, 1.29]	IRS
75^{th} (lny = 6.63)	1.20 [1.13. 1.29]	IRS

quartiles are facing increasing returns to scale (IRS). In fact, none of the sampled firms seem to be facing returns to scale that are less than one (decreasing returns to scale (DRS)). Zumpano, Elder, and Crellin (1993), Zumpano and Elder (1994), Anderson, Fok, Zumpano, and Elder (1998), and Lewis and Anderson (1999) also find that firms in the real estate brokerage industry are failing to take advantage of scale economies. The consolidation that is currently transpiring in this industry is evidence of a movement toward scale efficiency.

The results obtained from the sample, contain information that is somewhat problematic from a normative and regulatory point of view. To the extent that affinity programs allow smaller firms to take advantage of economies of scale, affinity participation may be efficiency enhancing. On the other hand, if firms grow too large they may begin to operate less efficiently because of diseconomies of scale. We also know that affinity participation tends to be concentrated among the larger firms and affinity affiliations are increasing. Although such diseconomies normally work to limit firm size, affinity programs may allow member firms to continue to grow despite inefficient operations because of a comparative advantage in generating listings and sales relative to non-affinity firms. If affinity groups provide a mechanism for less efficient firms to survive, or worse still, drive out more efficiently run firms, one result could be a less competitive market structure. This, in turn, could mean consumers could be left paying higher commissions for lower quality services.

It must be pointed out that what has been said above is still highly conjectural, especially because we cannot quantify the consumer benefits of affinity programs. It is possible that the benefits of affinity participation outweigh the costs of these programs. Moreover, it may not be the affinity programs, themselves, which are the culprits, but rather that affinity programs

may encourage inefficient growth in firm size. Equally important, the efficiency estimations undertaken in this study are based upon only one year of observations and affinity programs are still evolving. What the collective effect of affinity programs may be over time cannot yet be determined.

6. Concluding remarks

In this study, we provide the first rigorous empirical examination of the impact of affinity programs on real estate brokerage firms and the brokerage industry as a whole. Most of the evidence obtained from the sample supports the notion that affinity participation is on the rise, but still remains somewhat modest. Most of the sample firms that participate in affinity programs have multiple affinity partners, which usually take the form of corporations, unions, professional associations, and employers. Further evidence suggests that these affinity participating firms employ more workers, operate more offices, are more likely to franchise, and have more MLS affiliations.

With respect to firm performance, an examination of the actual financial numbers shows that affinity programs can potentially help firms grow in output and revenue volume. However, the results also suggest that these additional revenues are not being translated into increased profitability. In fact, on a per revenue transaction basis, non-affinity firms in the sample produce higher levels of adjusted net income, although the difference is not statically significant. It seems that the additional revenues generated from affinity program participation are offset by commission discounts and the increased costs associated with increased production.

To analyze the efficiency implications of affinity programs, we estimate X-efficiency levels for affinity-participating firms relative to non-affinity participating firms. For this sample, we find that affinity firms are much more inefficient than non-affinity firms. In fact, the probability that affinity firms are more efficient than non-affinity firms is less than one in 20,000, which translates into an odds ratio of 0.00005 to one. Finally, we find further evidence that firms are operating at increasing returns to scale.

As we note above, the results here are preliminarily and somewhat conjectural due to data limitations. However, the findings of this study serve as important benchmarks that can be used to monitor the growth and efficiency of affinity programs over time. The sample results obtained do provide strong and statistically significant evidence that affinity programs may hinder efficiency in the residential real estate brokerage market. Given the growth of affinity programs, these empirical findings pose concerns for the individual real estate investor. In less efficient and competitive markets firms may not have to work as hard or as efficiently to compete and survive. In a brokerage context, consumers could potentially see higher fees or at least fees that are above a market competitive rate. Moreover, the quality of service provided by firms may decrease, possibly resulting in higher search costs for the potential buyer or longer time on the market for the seller. The results suggest that regulators and policy makers may be justified in worrying about the growth of affinity programs within residential real estate brokerages, as it may ultimately be the individual investor in real estate that suffers.

References

Aigner, D. J., Lovell, C. A. & Schmidt, P. (1977). Formulation and estimation of stochastic frontier function models. *Journal of Econometrics, 6,* 21–37.

Agency Law Quarterly. (1998). *Real Estate Intelligence Report,* Vol. 9, No. 5, April

Anderson, R., Fok, R., Zumpano, L. V. & Elder, H. W. (1998). Measuring the efficiency of residential real estate brokerage firms. *Journal of Real Estate Research, 16,* 139–158.

Anderson, R., Lewis, D., & Zumpano, L. V. (2000a). Residential real estate brokerage efficiency from a cost and profit perspective. *Journal of Real Estate Finance and Economics, 20,* 3.

Anderson, R., Lewis, D., & Zumpano, L. V. (2000b). X-inefficiencies in the residential real estate market: A stochastic frontier approach. *Journal of Real Estate Research.*

Ball, S. (1990). Make the most of referral business. *Today's Realtor, 23,* 27.

Berger, W. (1997). Just whom do affinity relationships benefit. *Today's Realtor, 29,* 46–49.

Dezube, D. (1996). Hold on to your wallet: Referral fees are growing. *Today's Realtor, 29,* 42–45.

Lewis, D. & Anderson, R. (1999). Is franchising more cost efficient? The case of the residential real estate brokerage industry. *Real Estate Economics, 27,* 543–560.

Meeusen, W. & van den Brock, J. (1977). Efficiency estimation from Cobb-Douglas production functions with composed error. *International Economic Review,* 18435–444.

McMillan, D. (1997). Affinity relationships hot elsewhere, but not here: real estate discount for business groups rare in Portland. *Business Journal-Portland, 14,* 24–25.

National Association of REALTORS©. *Real. estate brokerage industry practices: Affinity and referral/relocation relationships,* 1996.

National Association of REALTORS©. *Profile of real estate firms,* Washington, D.C. 1998.

National Association of REALTORS©. *1997 Real estate brokerage industry practices: Affinity and referral/ relocation relationships,* 1998.

Reich–Hale, D. (1999). Affinity groups offer sales opportunities. *National Underwriter Property & Casualty-Risk & Benefits Management, 103,* 12–13.

Terrell, D. (1996). Incorporating monotonicity and concavity restrictions in flexible functional forms. *Journal of Applied Econometrics, 11,* 179–194.

Zumpano, L. V., Elder, H. W., & Anderson, R. I. (2000). The residential real estate market: An analysis of revenue and cost conditions over the last decade. *Journal of Real Estate Research, 18,* 1/2.

Zumpano, L. V. & Elder, H. W. (1994). Economies of scope and density in the market for real estate brokerage services. *American Real Estate and Urban Economics Association Journal, 22,* 497–513.

Zumpano, L. V., Elder, H. W., & Crellin, G. E. (1993). The market for residential real estate brokerage services: costs of production and economies of scale. *Journal of Real Estate Finance and Economics, 6,* 237–250.