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The Impact of Minimum Services Laws on Real Estate Brokerage Competitive Intensity

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Abstract

As many as fourteen US states have now mandated minimum service requirements for real estate brokerage relationships in residential transactions. This study attempts to determine whether these minimum service laws have any impact on brokerage competition. Federal government agencies allege such laws discourage competition because they limit the offering of nontraditional brokerage services. However, alternatively, a legislative "bright line" definition of the lowest level of acceptable service may reduce any perceived risk in offering non-traditional brokerage services and therefore encourage competition. Using several empirical strategies and state-level data over nine years (2000-08), we do not find any consistent and significant impact (positive/negative) of minimum services laws on number of licensees per 100 households, our proxy for competition. Interestingly, we also find that association strength, as measured by Realtor association membership penetration, has a strong deterring effect on competition.

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1. Introduction

There has been a recent trend for real estate brokers to offer non-traditional services to residential real estate consumers. For example, a home seller may decide to employ a broker to market and advertise a house, but not to show the property or negotiate the sale. Some state regulators have expressed concern with this new "limited" or "customized" service broker model, believing that a residential real estate consumer that enters into a relationship with a licensed real estate broker may not always know the level of brokerage services they need and should therefore be ensured brokers hired to represent them will provide certain services.[1] As many as fourteen US states now mandate minimum service requirements for real estate brokerage relationships in residential transactions.

The enactment of state minimum services laws has stimulated policy and academic debate as to their effect on both consumer and brokerage competition. In this paper, we jump into the competition debate. We theorize that minimum service laws may influence competition in two ways. If minimum service laws are binding (i.e., the laws require a service level above that which would be offered in their absence) they may be a barrier to entry to non-traditional service providers, limiting service choice and reducing competition. However, if minimum service laws are not binding, their "bright line" definition of the lowest level of acceptable service may reduce any perceived risk in offering non-traditional brokerage services, thereby encouraging entry of non-traditional service providers and increasing competition. Together with new search technology, nonbinding minimum service laws may actually expand the efficiency frontier, facilitating matching of buyers and sellers across multiple brokerage service platforms.

United States federal government agencies have adamantly opposed minimum service laws. The U.S. Department of Justice Antitrust Division (DOJ) and the United States Federal Trade Commission (FTC) have both lobbied state executive and legislative branches heavily against enactment of such laws. They published a report in April 2007 entitled "Competition in the Real Estate Brokerage Industry", theorizing that such minimum service requirements reduce competition because they limit choice of real estate brokerage services, force real estate consumers to buy services they may not want, and block brokers from offering less than a full package of real estate brokerage services (FTC and DOJ 2007).

A handful of other studies have also suggested that broker minimum service laws are anticompetitive. Based on a review of the academic literature and interviews with real estate industry participants, the U.S. Government Accountability Office concluded that state minimum services law may be one obstacle to greater brokerage price variation (GAO 2006). Several studies looking at brokerage competition issues tangentially discuss the possibility that minimum service laws could have a negative effect on competition (Levitt and Syverson, 2008; Goodwin, Johnson, and Zumpano, forthcoming, 2010; and Wiley, Zumpano, and Benefield, forthcoming, 2010).

While we recognize these arguments, we also propose that minimum service laws may facilitate competition. Without legislation, state common law establishes the extent of broker duties to real estate consumers. In many states, it may be or have been unclear whether a broker could legally offer a non-traditional level of services. A "bright line" legislative minimum services rule may actually encourage creative thinking about non-traditional brokerage services, since it clarifies

the acceptable level of minimum services that a broker can offer and therefore reduces the risk of liability for violating vague common law standards. This encourages discount brokerage entry into the industry by increasing returns after adjustment for risk.

Whether minimum service laws have a positive or negative effect on competition depend on whether such laws are binding – in other words, whether minimum service laws are significantly greater than the lowest level of brokerage service a real estate broker (as opposed to some non-agent platform such as an auction or "for sale by owner," FSBO) would offer in the absence of such laws. An analysis of the laws show that in many instances the threshold of what is actually required is very low compared to traditional brokerage services. However, improvements in online search technology have and will continue to reduce the fixed costs associated with brokerage services, thus giving rise to alternatives to traditional brokerage that provide greatly reduced services such as "MLS only" listings.[2] To understand the ramifications of the effects of minimum service laws, we develop an empirical model based on previous literature discussing real estate brokerage barriers to entry, non-price competition, and multiple service platforms.

The debate over whether minimum service laws impede competition influences legislation dealing directly with broker duties, and may influence public policy dealing with the role of new technology in real estate transactions.[3] We contribute to the literature by empirically examining whether state minimum service laws impact state brokerage competition. As a gauge of state brokerage competitive intensity, we look at the number of state real estate licensees per 100 households. Looking at all fifty states and the District of Columbia over nine years (2000-08),

we find that state minimum service laws have no consistent or significant impact on competitive intensity.

We have organized our paper is as follows. The second part looks at common and statutory duties that a real estate broker owes to consumers. We provide detailed information on the relatively recent state enactments of minimum services laws. In the third part, we review relevant theory related to the economic impact of minimum service laws; this section develops our own hypotheses about the effects of these laws. As part of our analysis in this section, we look at anecdotal evidence of non-traditional brokerage activities in states with and without minimum service laws. Then, we proceed to empirically test our hypotheses. Our methodology is outlined in part four, and variables and data used in part five. In part six, the results of the empirical analysis are discussed. We conclude in part seven with a summary of our findings which may have policy implications for state legislators and federal government agencies.

2. Broker Obligations to Real Estate Consumers

2.1. General Common Law Duties

Real estate brokers have traditionally owed several general legal duties to real estate consumers, with the extent of the duties based on whether the consumer was a client or a customer.[4] A broker is an agent of a real estate client, and therefore owes the common law fiduciary duties of agency that include obedience, loyalty, disclosure, confidentiality, accounting, and reasonable care (Restatement (Third) of Agency Chapter 8). A broker is not an agent of a customer, and therefore does not owe fiduciary duties based on agency theory. The common law in many states, however have imposed a duty on a broker based on tort theory to deal fairly and honestly

with customers (Restatement (Second) of Torts Sections 525, 550, and 552). The extent of these agency and tort theory duties must be discerned by looking at judges opinions in court cases. While the principle of precedent applies to common law decisions, opinions as to appropriate and required activity tends to evolve over time based on unique fact patterns, leaving brokers and consumers with detailed guidance only in hindsight.[5]

2.2. Specific Minimum Services Laws

Some states have defined specific services that real estate brokers must provide to clients and customers. These laws are referred to by the DOJ and FTC as "minimum service" laws, meaning "laws and regulations that enumerate specific tasks that a broker must perform for a client" (FTC and DOJ 2007). An example of a recently enacted law that would fit the DOJ and FTC definition of minimum services is Missouri Revised State Section 339.780 (7), enacted in 2005, that specifies that all brokers entering into an exclusive brokerage agreement must: (1) accept delivery of and present offers and counteroffers to clients and customers; (2) assist clients and customers in developing, communicating, negotiating, and presenting offers, counteroffers, and disclosure notices; and (3) answer clients and customers questions relating to offers, counteroffers, notices, and contingencies.

In the past decade, ten states have passed laws that require brokers to offer some minimum level of service in either all broker relationships or in exclusive broker relationships. Four additional states enacted such laws over a decade ago. Other states have laws that specify minimum services, but allow a broker and consumer to negotiate or waive the services. For example, like Missouri, Michigan Compiled Laws Section 2512d requires a broker to accept and present

offers, assist in negotiating, and to furnish a closing statement. Unlike Missouri, however, these services can be waived.

A list of states that have some form of minimum service laws, along with the enactment dates and relevant statutory or administrative regulatory provisions, is set out in Appendix 1. We base this list on the findings of Pancak (2008), who reviewed the status of minimum service laws in all the fifty states and the District of Columbia. The DOJ has also identified states as having minimum service laws; that list is available at www.justice.gov/atr/public/real_estate. The list in Appendix 1 differs somewhat from the DOJ list for the reasons outlined in Pancak (2008). For example, Oregon is on the DOJ list because Oregon State Statutes Section 696.805(2) (b) requires that brokers "…present all written offers, written notices and other written communications to and from the parties in a timely manner...." However, in many states, the general understanding of the intent of timeliness requirements is to mandate prompt communication rather than requiring a minimum level of brokerage services. Therefore without specific state guidance, it is unclear whether statutory language requiring timeliness is actually requiring a minimum level of services. To our knowledge, only Idaho has actually stated that its law requires more than timeliness, specifically requiring that a broker reviews the offers, and among other things, ensures that the offer discusses the form and amount of deposit received and contains appropriate signatures and property legal description.[6]

3. Modeling the Impact of Minimum Service Laws

This section will provide a brief review of the literature relevant to minimum service laws, their effect on competition and their possible impact on consumer welfare. We point out that the effect

on competition depends on whether the level of minimum service is binding or nonbinding. The effect on consumer welfare arguably depends on the tradeoff between time on the market and transactions costs. This tradeoff is facilitated if customers can choose from an array of brokerage services depending on the value of his/her time and other personal considerations such as residency in a neighborhood near the transaction.

3.1. Effect on Competition if Binding

The DOJ and FTC allege that laws requiring a minimum level of real estate brokerage services reduce brokerage competition because: (1) brokers cannot offer less than the minimum package of brokerage services, and therefore (2) real estate consumers are forced to buy services they may not want or need (FTC and DOJ 2007). The agencies have voiced a particular concern that minimum service laws restrict brokers from offering (and sellers from buying) a MLS-listing-only service for a greatly reduced flat fee.[7] In a MLS-listing-only service, a seller contracts with a broker to list the seller's property on a broker multiple listing service only, not for any other services such as help in making offers or negotiating. The agencies assert that laws requiring a broker to help a consumer in making offers and negotiating basically require consumers to contract for a traditional bundle of brokerage services at a fee of 5 or 6 percent of the property sales price. They conclude that since brokers cannot compete on level of services, they are not able to compete on price, thus greatly reducing industry competition and economic efficiency.

Turnbull (1996) models the opposite situation: non-price competition may lead to over-production of services. In his model, fixed commission rates and low barriers to entry imply non-price competition: i.e., competition sets the level of service for a fixed commission. Services

mentioned by Turnbull include: information relative to ask and offer prices; recommendations for inspectors, lawyers and lenders; guidance through "the maze of paperwork" (Turnbull, 1996, p. 295). The reason for non-price competition is that an individual broker can compete for a larger share of transactions by providing higher service. This implies that brokers increase services until profits are driven to zero and marginal cost of extra services equals marginal revenue. Turnbull's model suggests that brokerage service levels were traditionally over-provided, which implies unmet demand for less-than-full service brokerage. Therefore, as commission rates or other compensation are allowed to vary, minimum service laws are more likely to be binding.

A key assumption in Turnbull's model is that commission rates are fixed. But substantial evidence suggests that there is some variability over the housing market cycle and across states (Turnbull and Sirmans, 1997; Wiley, Zumpano, and Benefield, Forthcoming, 2010). Evidence for flexible commission rates includes commission rebates and flat fee contracts. Therefore, we control for commission rebates in our analysis.

Other studies have also suggested that minimum service laws may have a negative impact on brokerage competition, making the implicit assumption that the laws are binding. None of these studies, however, empirically tested their assumptions. Based on a review of the academic literature and interviews with real estate industry participants, the U.S. Government Accountability Office concluded that widespread use of the internet in real estate transactions should encourage more brokerage price variation, but may be hindered by obstacles including minimum service laws (GAO 2006). Also based on similar research, Hahn, Litan, and Gurman

(2006) concluded that minimum service requirements are impeding brokers from offering limited services and charging a flat fee rather than a commission**.** Miceli, Pancak, and Sirmans (2007) determined that minimum service laws may be an attempt to prop up a brokerage compensation scheme that, while possibly in the best interests of brokers, is socially unproductive. Magura (2007) proposed that state minimum service laws have a chilling effect on broker price cutting by accommodating buyer brokers behavior of steering buyer clients away from sellers with limited representation. White (2006) observed that mandatory minimum service requirements for sellers' brokers eliminated competition from limited service brokers whose only service would be to provide access to a MLS.

3.2. Effect on Competition if Nonbinding

Minimum service laws that require a broker to answer questions, accept offers, and assist in negotiating do appear to restrict brokers from offering sellers the option of only listing their property on an MLS. However, it should be noted these minimum service laws in and of themselves do not require a real estate consumer to hire a broker in a real estate transaction since FSBO and auctions are viable options; in other words, sellers are free to advertise their properties on their own on non-MLS websites or other media. The primary limitation then, as recognized by the DOJ, is that a brokerage relationship must be something more than simply listing a seller's property on the brokerage sponsored MLS website. If there is to be a brokerage relationship, the minimum service laws set the minimum level of services that a real estate consumer can expect. Contrary to assumptions made in some previous studies, under minimum service laws, a broker still can offer a menu of possible service choices and charge a flat fee for

the services provided. Minimum service laws do not require a broker to charge a specific rate for services or require that a broker offer the traditional full bundle of brokerage services.

So are minimum service laws binding on brokers? Yes, if a broker would enter into a brokerage relationship that involved no level of active brokerage assistance. No, if common law, regardless of state legislative mandates, imposes some type of active brokerage assistance in brokerage relationships. Next we argue that legal theory and anecdotal evidence suggesting that, in many states, the "bright line" benefits from minimum service laws may encourage competition, cancelling most anticompetitive effects.

Prior to a state's minimum service laws, there may have been uncertainty in the brokerage community as to exactly what level of services a broker needed to offer to meet common law duties to clients and customers. Would a court conclude that fiduciary duties of loyalty to a seller client required that a broker be present at all property showings, oversee negotiation at all stages of the transaction, or handhold the seller through the closing process? In hindsight, would a judge rule that a broker's duty of fairness to a buyer customer included responding to the buyer's questions and facilitating the buyer's negotiation? Ehrlich and Posner (1974) discuss situations where greater specificity in legal rules is more efficient than vague common law standards.

Over the past two decades, there have been numerous examples of state brokerage legislation that have clarified brokerage duties and liabilities, including mandatory agency disclosure, property condition disclosure, buyer representation, dual agency, designated agency, and non-agency. Many of these new rules have redefined common law standards to reflect changing

market place conditions, providing a safe harbor for brokers opting to offer non-traditional services and practices. As an empirically testable proposition, we propose that minimum service laws may similarly encourage the provision of non-traditional services.

There is anecdotal evidence that brokers in states that have passed minimum service laws are unbundling the traditional full package of brokerage services and offering real estate consumers the option of purchasing the bare minimum level of services as required by statute. For example, Select A Fee Real Estate System™ in Illinois lets a home seller choose a desired level of services for a fixed fee, not the traditional package of services for a commission. With their "Bare Bones Service" a seller can hire a listing broker to sell his or her house for only $350 plus 2.5% to be paid to the buyer broker at closing. For this price, the listing broker will place the property on a multiple listing service, but the seller must show the home and hold open houses. Once a buyer presents a contract, the listing broker will help the seller negotiate, stating on their website that this is a minimum level of service required by Illinois law (www.selectafee.com). In Kentucky, 499 MLS Realty will work for a seller for $499. For that price the broker lists the seller's home on a multiple listing service and also helps negotiate the sale and assist the seller through other phases of the contract process (www.499mlsrealty.com).

There is also anecdotal evidence that brokers may be ignoring or finding the loopholes in state minimum service laws. For example, Flat Fee Realty in Iowa advertises that it will enter into an arrangement with a seller to provide only entry to the local multiple listing service for $395. While Iowa requires more detailed minimum services in all brokerage agreements, those services are not offered. It is unclear whether this firm is ignoring the law, or sidestepping the law by

rationalizing that the seller is still a For Sale By Owner (as stated on their website) and therefore a brokerage agreement has not been entered into (www.eFlatFeeRealty.com). Many other brokerage firms advertise on the internet that they will provide the service of entry on a multiple listing service alone for a flat fee in all fifty states (thus apparently ignoring minimum service laws in those states that require them). (See for example, www.flatfeelisting.com, www.listbyownerinmls.com, www.mlsmart.com, www.aflatfee.com, and www.valuemls.com.)

3.3. Effect on Consumer Welfare

A handful of studies that have looked at the effects of nontraditional (limited service) brokerage as compared to traditional (full service) brokerage, and have drawn conclusions from that as to the consumer welfare effects of minimum service laws. Levitt and Syverson (2008), Goodwin, Johnson, and Zumpano (Forthcoming, 2010), and Wiley, Zumpano, and Benefield (Forthcoming, 2010) all compared variables for houses listed with limited service brokers and those with full service brokers. All three concluded that residential real estate consumers using limited-service flat-fee brokers were not worse off than those using full-service, full-commission brokers, but for different reasons. Levitt and Syverson (2008) found that houses listed with limited service brokers take longer to sell but eventually sell at similar prices to those listed with full-service brokers. The authors weighed the trade-off between the lower fees charged by a limited-service broker and the longer time on the market, and reasoned that consumers were not worse off than those using full-service brokers.

Goodwin, Johnson, and Zumpano (Forthcoming, 2010) found that limited service brokers actually obtain a nominally higher selling price for sellers, although they also experience longer

time on the market and a decrease in the likelihood of finding a buyer in a given marketing period. Wiley, Zumpano, and Benefield (Forthcoming, 2010) found that limited service brokers do not increase a property's time on the market, and that selling price is not significantly different than with full service brokers.

The findings of Goodwin, Johnson, and Zumpano (Forthcoming, 2010) are basically consistent with FSBO results reported by Hendel, Nevo and Ortalo-Magne (2009). They provide evidence that full service brokers do not increase the selling price. But, in their sample, full service brokers do increase the probability of sale within a given time period. If they do not increase sales price, the services such as negotiation and dealing with paperwork are the most likely explanation of the willingness of some sellers to use full service brokers.[8]

Armstrong (2006) points out conditions favoring welfare gains from competing market platforms.[9] First, extensive cross-group externalities favor multiple platforms. This refers to the benefits to sellers if many buyers use a given platform, and vice versa. Second, flat fee transactions (i.e., an alternative to commission based on a percentage of value) favor multiple platforms. For our application, flat fees represent one form of flexible compensation scheme. Third, multi-homing favors multiple platforms: i.e., the ability of buyers and sellers to switch from one platform to another, just as one might buy stocks on a stock exchange or on the over the counter market.

Multi-homing behavior has been documented by Hendel, Nevo and Ortalo-Magne (2009). Patient sellers (e.g., those not moving with job, locally based, with ample financial resources) are

likely to choose FSBO, a matching platform with longer time on the market. Sellers can and do switch across platforms: failure to sell as a FSBO is much higher than with a full service broker, but the seller always has the option to switch. Likewise, patient buyers (e.g., locally based) are more likely to use the MLS and avoid patient sellers. However, if these sellers do not find what they want on the MLS, they can use FSBO simultaneously, or switch to it at a later time.

Our conclusion: there are welfare gains from a range of service options available to buyers and sellers. Since sellers are unlikely to receive a significantly lower price if they sell through a minimum service broker (see, e.g., Hendel, Nevo and Ortalo-Magne, 2009), we address the important remaining issue: what is the effect on the level of competition? Minimum service laws increase competitive intensity if they define a legal service level allowing heterogeneous agents to match across platforms. I.e., the "bright line" defined by these laws may increase entry and allow welfare maximizing choices on both sides of the market. On the other hand, these laws may have an adverse - effect by creating barriers to entry. Our empirical analysis will provide evidence on this issue.

4. Empirical Methodology

4.1. Dynamic Panel Model of Competitive Intensity

We model competitive intensity, measured by the number of total licensees per 100 occupied households ($lichh_{it}$) for state i in year t. Competitive intensity is a function of state and time fixed effects, policy intervention in the form of the adoption of minimum service laws at particular points in time, and a group of control variables. We allow for a dynamic relationship:

in any state, a given level of competitive intensity is conditioned by political, institutional and historical circumstances controlled with $lichh_{it-1}$:

$$lichh_{it} = \beta_0 + \beta_1 lichh_{it-1} + \beta_2 minsvc_{it} + x_{it}^{'}\gamma + \varepsilon_{it} \quad (1)$$

where the β's are scalars and $minsvc_{it}$ is a dummy variable for the policy intervention of interest. In equation (1), γ is a column vector conforming to the transposed vector of year-specific state attributes, $x_{it}^{'}$. The vector of control variables include a measure of the strength of the REALTORS® association, change in house prices, change in per capita income, vacancy rate, in-migration, and number of housing transaction per 100 households.

The disturbance term is specified as a two-way error component model:

$$\varepsilon_{it} = \mu_i + \lambda_t + \nu_{it} \quad (2)$$

where μ_i denotes a state-specific fixed effect and λ_t a year-specific effect.

The literature documents well-known issues of serial correlation, heteroscedasticity and, most importantly, endogeneity associated with estimating the model given by equations (1) and (2): See Baltagi (2008) for an accessible, detailed discussion. We follow recent literature for dealing with these issues. Specifically, we:

1. control endogeneity by using multiple lags for instruments in generalized method of moments (GMM) two step estimators;
2. test for over-identification;
3. calculate robust standard errors;

4. deal with serial correlation with Arellano and Bond (AB) tests.

These methods and tests will be introduced as additions to an ordinary least squares model as in Baltagi (2008), chapter 8.

4.2. Semi-parametric Model of Competitive Intensity

In standard parametric estimations, we generally put distributional assumptions on the data. In comparison, propensity score matching model, developed in Rosenbaum and Rubin (1983), is a semi-parametric approach to estimate the treatment effect that allows selection on observables. In effect, sample selectivity and endogeneity are addressed by matching the control sample to the treatment sample as closely as allowed by observable characteristics.

As standard in the literature, the propensity score is defined as the conditional probability of receiving a treatment (i.e. adoption of minimum services law) given a vector of pre-treatment characteristics:

$$P(d_i) = E(d_i \mid x_i) \tag{3}$$

where $d_i = \{0, 1\}$ is the treatment dummy, and x_i is a vector of pre-treatment attributes.

The average treatment effect on the treated units is defined as:[10]

$$effect_{d=1} = \frac{1}{N_{d_j=1}} \sum_{\forall i \in d_j=1} lichh_j(x_j) - E[lichh_j \mid P(x_j), d_j = 0] \tag{4}$$

The first step – i.e. equation (3) – in the two-step procedure involves estimating the conditional probabilities using a logit or probit link function that controls for a set of attributes. The second step – i.e. equation (4) – uses the conditional probabilities (i.e. the propensity score) from

equation (3) to perform the matching process and compute the average treatment effect. We estimate standard variations of the estimators to show robustness of our results. Specifically, we employ four estimators i.e. stratification, kernel matching, nearest neighbor and radius matching estimators. We ensure that the balancing property is satisfied in our estimation.

The Stratification method involves partitioning the range of the propensity score into equal intervals or bins such that within each interval treated and control units have, on average, the same propensity score and are observationally equivalent; i.e. the balancing property is satisfied. The next step is to compute the difference between the average outcomes of the treated and the controls within each interval. The treatment effect is finally obtained as an average of the differences of each block with weights given by the distribution of treated units across blocks. The design of the stratification method is such that it discards the bins without any treated or control observations.

By contrast, Nearest Neighbor method takes each treated unit and searches for the control unit with the closest propensity score. With matching performed between each treated unit and a control unit, the difference between the outcomes is computed. The treatment effect is then obtained by averaging these differences. However, by design, Nearest Neighbor method finds match for all treated units and thereby may lead to quite poor matches.

The Radius Matching and Kernel Matching methods may provide improvement in quality of matches. With Radius Matching method, each treated unit is matched only with the control units whose propensity score falls in a predefined circle (i.e. within a specified radius) of the

propensity score of the treated unit. With Kernel Matching method, all treated units are matched with a weighted average of all controls with weights defined as inverse of the Euclidean distance between the propensity scores of treated and controls.[11]

5. Variable Specifications and Data Description

So far fourteen states have enacted minimum services laws requiring brokers to provide certain level of service, including ten since 2004: a list of the states and summary of the statutes are provided in Appendix 1.[12] In our empirical analysis, we have controlled for both institutional and economic variables for all fifty states and the District of Columbia from 2000 to 2008 (459 observations). The time period allows us to observe most of the states sufficiently before and after the adoption of the minimum services requirement. Our dependent variable is brokerage competitive intensity, which we measure as number of state real estate licensees per 100 households. This formulation allows for state size effect. Table 1 presents the variables used in our analysis with their definitions, sources, and expected signs. Table 2 reports the summary statistics of variables used in the paper and presents mean and standard deviation for two sets of states, one with minimum services laws and the other without such laws.

5.1. Institutional Variables

The state institutional variables used are obtained from the *Digest of Real Estate Licensing Laws and Current Issues* (reports from 1999 till 2009) compiled by the Association of Real Estate Licensing Law Officials (ARELLO). States with mandated minimum services requirement have slightly higher number of licensees per 100 households, 2.28 compared to 2.04 for the states without any such requirements.

We measure state broker association strength by looking at National Association of Realtors (NAR) membership as a percentage of total number of state licensees. On average, states with and without minimum services law look similar in terms of association strength (48.67 percent compared to 47.76 percent). We would expect that an increase in the penetration of state NAR membership may adversely affect competitive intensity due to rent-seeking motivation to deter new entry. In a well organized industry, agents may have different motivation behind supporting or opposing legislation from that of a weakly organized industry. Therefore, our specifications include a spline function for the NAR association strength variable by placing the 'knot' at the 50 percent strength level.

In our two-stage models, we control for a set of institutional variables to estimate the conditional probabilities as in equation (3). In terms of specification, we follow model specifications in Nanda and Pancak (2010) closely. To capture the institutional environment better, we include indicator variables reflecting the presence of rebate law and non-agency law. Pre-licensing hour requirement, continuing education requirement and licensee fees provide valuable information on ease of entry and maintaining the broker licenses. The strength of industry influences in real estate boards is computed as number of industry members in the board.

5.2. Economic Variables

We control for the factors influencing the demand for housing and brokerage services. Those variables are: house price growth, percent change in per capita income, vacancy rate, volume of in-migration per 100 residents and volume of housing transactions per 100 households. We use

the purchase-only quarterly Housing Price Index (HPI) by the Federal Housing Finance Agency (FHFA). We take the average year-over-year rate of change for the year. Data used for the other variables are obtained from the NAR, US Census Bureau, Internal Revenue Service, and US Bureau of Economic Analysis. The mean house price growth for the states with the mandate is 5.30 percent compared to 5.84 percent for the other states. Per-capita income growth is slightly stronger in the states with the mandates. Vacancy rate indicates demand for housing and thus broker services. In the states with minimum services requirement, the vacancy rate is higher than that for the rest of the states (2.19 percent compared to 1.91 percent). In-migration level is roughly the same in both the groups of states. The states with mandated requirement have seen slightly higher level of transaction than the rest of the states (5.67 compared to 5.49 transactions per 100 households)

6. Results

6.1. Standard Panel Models (Table 3)

Table 3 reports results from four different specifications in a standard panel data set-up. The variables are de-trended to strip out the national trend and time effect. We include state fixed effects to control for the unobserved heterogeneities. Robust standard errors are used to obtain the t-statistics. Column (1) reports a simple OLS model using the full sample. Column (2) presents the model that controls for state fixed effects. Neither model shows any significant effect of minimum service mandates on competitive intensity.

Column (3) and (4) partition the time period to deal with the possibility of asymmetric response of law adoption under different market conditions. Column (3) uses the same model as in column

(2) within the 'normal' year sample: the 2000-04 time period is characterized by relatively low demand-supply mismatch. On the other hand, column (4) provides the 'boom' period estimates. The 'bust' year, 2008 is excluded from both columns (3) and (4). The large but insignificant minimum service coefficient (-.418) during boom periods might be interpreted as providing some support for the DOJ position when there is high incentive for entry into the industry. On the other hand, this coefficient could be due to insufficient control for endogeneity, sample selectivity or serial correlation. Subsections 6.2 and 6.3 will add more controls.

Our most important and robust finding from Table 3 is the highly significant and negative effect of the association strength on competitive intensity. The effect is very robust across the models and more pronounced at the lower than 50 percent level of association strength. In terms of effect size, 1 percentage point (i.e. 100 basis points) increase in association strength (below 50 percent level) is associated with 11.2 basis point decrease in competitive intensity (column 2). For association strength higher than 50 percent level, the effect is minus 3.4 basis points.

6.2. Propensity Score Models (Table 4)

In estimating models in Table 3, we have assumed away any endogeneity in time-varying variables. However, to allow for selection on observables, Table 4 presents the two-stage estimation and semi-parametric models. We only report our variable of interest and suppress other controls. The bootstrapped standard errors are used in calculating the t-statistics. Column (1) reports the simple two-step procedure. The first stage model is a logit specification.[13] The predicted probabilities from the first stage logit model replace the minimum service dummy in the second stage model. We find no significant effect between predicted probability of law

adoption and competitive intensity. Likewise, no significant treatment effect is found using the propensity score model (stratification technique) in column (2). We do not find any difference in direction and significance when we use kernel matching, nearest neighbor and radius matching models in columns (3) to (5) respectively. Overall, we find very similar effects as in Table 3. The estimates are always negative and insignificant with varying sizes, suggesting that any support for the DOJ position is not robust.

6.3. Dynamic Panel Models (Table 5)

The purpose of the dynamic panel models in Table 5 is to evaluate robustness to three key concerns discussed in section 4.1: heteroscedasticity, serial correlation, and validity of instruments. As standard in the econometric literature, we present a range of models that differ in terms of number of lagged instruments and correction for heteroscedasticity, and perform one-step and two-step generalized method of moments (GMM) estimation in first-differences. We apply Huber-White computation for heteroscedasticity in a one-step GMM procedure and the finite-sample correction for the asymptotic variance of the two-step GMM estimator (Windmeijer 2005).

To test for serial correlation, we perform Arellano-Bond tests. Table 5 shows the p-values of AR(1) and AR(2) tests of the null hypothesis of no first or second order serial correlation, respectively. Results of these tests confirm that we cannot reject the null hypothesis of no first and second-order serial correlation at the 5 percent significance level.

The dynamic panel GMM estimator uses multiple lags as instruments and thus a test of over-identification is recommended. We perform the Hansen test that yields a J-statistic under the null hypothesis that instruments are exogenous. By default, the model uses all available lags as instruments. However, the efficacy of the Hansen J test weakens with too many instruments, as evident by the tests returning perfect p-values of 1.00 for models (1), (3) and (5) using a full set of instruments.[14] Therefore, we restrict our models (2), (4) and (6) by allowing second lagged instruments only. The results reveal J statistics with p-values ranging between 0.332 and 0.649 for models with second lagged instruments only. Therefore, we cannot reject the null hypothesis that our instruments are valid.

The results in Table 5 reassure our concern about endogeneity and serial correlation: the lagged dependent variables are important and fairly significant inclusions in our models. The sizes of the coefficients on the minimum services mandate are about the same as the lower estimates in Tables 3 and 4. These findings suggest that the large negative coefficients in Tables 3 and 4 were due to insufficient controls. Overall, we do not find any significant association between the minimum services mandate and competitive intensity.

Across the columns and regardless of the econometric assumptions or model specifications, the result on association strength is very robust and significant, similar to the simple fixed effect model in Table 3, column (2). The negative and significant effect of a 1 percentage point change in the strength level on competitive intensity varies within a narrow range of 9.1 to 9.8 basis points for the strength level lower than 50 percent and 3.4 to 4.3 basis points for the strength level higher than 50 percent. Moreover, we find that in-migration per 100 residents is an

important factor and provides significant positive feedback to the competitive intensity. The number of transactions per 100 households results in an expected positive effect at the higher-order lags, showing a delayed impact on demand for broker services.

7. Conclusion

We evaluate the effect of state broker minimum service laws on the level of state brokerage competition. Federal government agencies consider such laws anticompetitive. We use several empirical strategies and state-level data over nine years (2000-08) to evaluate this claim.

Overall, our models show four results:

1. We do not find any consistent and significant impact of minimum services laws on number of licensees per 100 households, our proxy for competitive intensity.
2. Association strength, as measured by Realtor association membership penetration, poses a strong deterring effect to competition in the broker market.
3. In-migration leads to higher demand for broker services and provides an impetus to competitive intensity.
4. The volume of housing transactions, a general indicator of the demand for broker services, positively affects competitive intensity and the effect is transmitted through delayed response.

We believe the reason minimum service laws may have little impact on competition is that such laws generally set the brokerage service threshold very low. In fact, the enactment of minimum service laws may have provided "bright line" guidance that brokers could offer services below

those that would have been offered in the absence of the laws. There is anecdotal evidence that brokers are now doing just that, and offering a wide variety of non-traditional, unbundled brokerage services to consumers. Therefore any anticompetitive effect of the minimum services laws may have been negated by the competitive effects of such laws.

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Table 1: Variable Description

Variables	Definitions	Expected Signs (reason)
Institutional Measures		
Licensees	Number of total licensees per 100 occupied households (Source: ARELLO, ACS); dynamic	Dependent Variable
Min. Svc.	Whether the state has any minimum services requirement (yes=1, else=0) (Source: Pancak 2008); dynamic	Negative; minimum services law restricts entry
Rebate	Whether the state allows some form of rebate on commissions (yes=1, else=0) (Source: ARELLO); static	Positive; Rebate laws promote price competition
Non-Agency	Whether the state allows non-agency positions (yes=1, else=0) (Source: ARELLO); static	Negative; agencies which do not qualify under minimum services may switch to non-agency forms.
Pre-licensing Hour	Pre-licensing number of hours required for salespersons[15] (Source: ARELLO); static	Negative; stricter pre-licensing hour requirement restricts entry.
Continuing Education	Continuing education number of hours requirement (Source: ARELLO); static	Negative; stricter continuing education hour requirement restricts competition.
Licensee Fee	Initial/original license $fees per license/registration period for active broker (Source: ARELLO); static	Negative; higher licensing fees restricts entry.
Industry Strength	Percentage of industry members on the state licensing board[16] (Source: ARELLO); static	Negative; rent-seeking motivation attempts to restrict entry.
Association Strength	State National Association of REALTORS®, Inc. membership[17] as a percentage of active state licensees[18] (Source: NAR, ARELLO); dynamic	Negative; rent-seeking motivation attempts to restrict entry.
Economic Measures		
House Price Growth	Average of percent YoY change in quarterly FHFA purchase-only state house price index (Source: FHFA); dynamic	Positive; rapid house price growth leads to higher willingness to pay for broker services
Income Growth	Percent change in per capita income (Source: BEA); dynamic	Positive; high income growth may lead to higher housing demand and thus higher demand for broker services
Vacancy Rate	Homeowner vacancy rate (Source: Housing Vacancy Survey, U.S. Census Bureau); dynamic	Positive; higher vacancy level implies larger need and more willingness to pay for broker services.
In-migration	In-migration per 100 population (Source: IRS); dynamic	Positive; in-migration leads to higher housing demand and thus higher demand for broker services
Transaction	Number of transactions/existing home sales per 100 households (Source: NAR, ACS); dynamic	Positive; higher the transaction volume greater is the demand for brokerage services

Table 2: Summary Statistics

	51 States Characteristics: 2000—2008: 459 Observations					
Variables	**N**	**Mean**	**Std. Dev.**	**N**	**Mean**	**Std. Dev.**
	States with Mandated Minimum Services			**States without Mandated Minimum Services**		
Licensees	69	2.28	0.91	360	2.04	1.17
Pre-licensing Hour	74	83.84	40.56	331	68.16	28.36
Continuing Education	74	11.22	9.99	375	5.57	4.27
Licensee Fee	74	176.26	80.52	367	176.10	102.16
Industry Strength	74	74.91	9.27	385	69.19	18.51
Association Strength	69	48.67	11.13	359	47.76	13.90
House Price Growth	74	5.30	7.71	385	5.84	6.01
Income Growth	74	4.48	2.31	385	4.23	2.30
Vacancy Rate	74	2.19	0.71	385	1.91	0.73
In-migration	74	1.34	0.52	385	1.39	0.62
Transaction	74	5.67	1.07	380	5.49	1.32

NOTES: Missing information is the reason behind less than 459 observations for some variables. See Table 1 for definitions of variables.

Table 3: Standard Panel Data Models
(Dependent Variable: number of licensees per 100 households)

	(1)	(2)	(3)	(4)
Min. Svc.	0.085	-0.070	0.018	-0.418
	(0.73)	(-0.69)	(0.18)	(-1.21)
Association Strength <= 50	-0.074*	-0.112*	-0.140*	-0.105*
	(-6.37)	(-5.24)	(-4.17)	(-21.97)
Association Strength > 50	-0.021*	-0.034*	-0.036*	-0.024*
	(-3.44)	(-9.44)	(-4.55)	(-4.66)
House Price Growth	0.041*	-0.005	0.013	0.001
	(2.71)	(-0.81)	(0.81)	(0.18)
Income Growth	-0.110*	0.000	0.005	-0.016
	(-4.41)	(0.03)	(0.32)	(-1.32)
Vacancy Rate	0.111	-0.026	-0.062	0.009
	(1.10)	(-0.37)	(-0.78)	(0.17)
In-migration	0.342*	0.382***	-0.563	0.301
	(4.40)	(1.69)	(-1.45)	(1.09)
Transaction(lag1)	0.114	0.020	0.013	-0.006
	(1.62)	(0.44)	(0.15)	(-0.19)
Model Description	De-trended OLS	De-trended State FE	De-trended State FE	De-trended State FE
Sample	All Years	All Years	Normal Years (2000-04)	Boom Years (2005-07)
N	373	373	203	128
R^2	0.481	0.922	0.932	0.992

NOTES: Robust standard errors are used for reported t-statistics within the parentheses. '*', '**', and '***' denote 1 percent, 5 percent and 10 percent significance levels.

Table 4: Two-Stage and Propensity Score Models
(Dependent Variable: number of licensees per 100 households)

	(1)#	(2)	(3)	(4)	(5)
Min. Svc.	-0.475	-0.146	-0.138	-0.207	-0.013
	(-1.05)	(-0.86)	(-1.09)	(-0.91)	(-0.08)
Model Description	Logit (stage-I) De-trended State FE (stage-II)	ATT Stratification Method	ATT Kernel Matching Method	ATT Nearest Neighbor Method	ATT Radius Matching Method

NOTES: Robust standard errors are used for reported t-statistics within the parentheses. Model (2)-(5) reports bootstrapped standard errors. '*', '**', and '***' denote 1 percent, 5 percent and 10 percent significance levels. # Model (1) uses the predicted min. svc. law dummy variable from a first-stage logit model. See the text for model specification. ATT indicates a propensity score model.

Table 5: Dynamic Panel Data Models
(Dependent Variable: number of licensees per 100 households)

	(1)	(2)	(3)	(4)	(5)	(6)
Licensees (lag1)	0.089*	0.066***	0.093*	0.066	0.092	0.072
	(3.30)	(1.97)	(3.14)	(1.52)	(1.65)	(1.25)
Licensees (lag2)	0.047*	0.033	0.055*	0.037	0.038*	0.023
	(2.85)	(1.37)	(2.88)	(1.25)	(2.70)	(1.34)
Min. Svc.	-0.133	-0.127	-0.078	-0.144	-0.147	-0.225
	(-0.97)	(-0.60)	(-0.50)	(-0.61)	(-0.99)	(-1.03)
Association Strength	-0.093*	-0.093*	-0.091*	-0.093*	-0.095*	-0.098*
<= 50	(-10.62)	(-8.40)	(-9.51)	(-9.32)	(-10.92)	(-11.11)
Association Strength	-0.034*	-0.043*	-0.035*	-0.041*	-0.034*	-0.041*
> 50	(-7.54)	(-5.80)	(-5.22)	(-4.92)	(-7.36)	(-5.18)
House Price Growth	0.013**	0.011**	0.007	0.006	0.004	0.004
(lag1)	(2.47)	(2.27)	(1.11)	(0.94)	(0.96)	(0.77)
Income Growth	-0.001	-0.001	-0.004	-0.005	-0.003	-0.004
	(-0.14)	(-0.15)	(-0.54)	(-0.63)	(-0.50)	(-0.57)
Vacancy Rate	0.028	0.015	0.056	0.021	-0.007	-0.011
	(0.82)	(0.40)	(1.25)	(0.53)	(-0.16)	(-0.27)
In-migration	0.941*	1.309*	0.814*	1.031*	0.899*	1.034*
	(3.53)	(3.62)	(3.20)	(2.97)	(3.74)	(3.46)
Transaction (lag1)	-0.054	-0.078**				
	(-1.56)	(-2.03)				
Transaction (lag2)			0.021	-0.006		
			(0.32)	(-0.06)		
Transaction (lag3)					0.085***	0.094
					(1.87)	(1.35)
Model Description	One-step difference GMM Full Instruments	One-step difference GMM 2nd. Lagged Instruments only	Two-step difference GMM Full Instruments	Two-step difference GMM 2nd. Lagged Instruments only	Two-step difference GMM Full Instruments	Two-step difference GMM 2nd. Lagged Instruments only
N	253	253	253	253	203	203
Number of Instruments	147	61	147	61	134	52
Arellano-Bond Test for AR(1) in 1st. Differences	0.131	0.070	0.239	0.211	0.195	0.155
Arellano-Bond Test for AR(2) in 1st. Differences	0.340	0.820	0.325	0.727	0.275	0.595
Hansen Test of Over-identification Restriction	1.000	0.625	1.000	0.649	1.000	0.332

NOTES: Robust standard errors are used for reported t-statistics within the parentheses. For one step GMM, Huber–White standard errors are computed, while the two step GMM estimates are Windmeijer (2005) corrected. '*', '**', and '***' denote 1 percent, 5 percent and 10 percent significance levels. The values reported for the Hansen test are the p-values for the null hypothesis of instrument validity. The values reported for AR(1) and AR(2) are the p-values for first and second order serially correlated disturbances in the first difference equations.

Appendix 1: States with Non-waivable Minimum Service Requirements

STATE	YEAR SECTION ENACTED	CODE OR REGULATION SECTION	SUMMARY OF APPLICABLE PROVISION(S)
Enacted after 2000			
Alabama	2005	Alabama Code §§ 34-27-84 (c)	At a minimum, **all listing brokers must**: - accept delivery of and present all offers to assist the consumer in negotiating offers - answer the consumer's questions relating to the transaction
Arizona	2005 *Year language about taking reasonable steps to assist a client in confirming information was added.*	Arizona Administrative Code R4-28-1101	**Brokers must** do the following for a client: - use reasonable care to obtain information material to a client's interests and relevant to the contemplated transaction, and communicate the information to the client - take reasonable steps to assist a client - take reasonable steps to assist a client in confirming the accuracy of information relevant to the transaction Licensees must perform acts expeditiously, and can't intentionally or negligently delay performance
Idaho	2007	Idaho Statute § 54-2087(3)	If a broker enters into a **written contract for representation** to represent a client, the broker must: - **be available to the client** to receive and timely present offers. This duty is mandatory and can't be waived. While the state allows non-agency, this requirement applies to all types of representation or customer service agreements.
Illinois	2004	225 Illinois Compiled Statutes 454, Article 15, Section 75	In an **exclusive brokerage agreement**, the broker must provide the following services: - accept delivery of and present offers - assist the client in developing, communicating, negotiating, and presenting offers - answer client questions
Indiana	2006	Indiana Code 25-34.1-10-9.5	If a broker **DOES NOT have an agency relationship with a consumer**, at a minimum the broker has to perform the following: - be available to receive and present offers - assist in negotiating, completing real estate forms, communicating - respond to questions If a second broker performs those duties for the consumer, because the first broker failed to perform them, there would not be an agency relationship between the second broker and the consumer. If a **broker DOES have an agency relationship with a client,** the broker must fulfill the terms of the agency relationship, and present all offers immediately upon receipt. Only applies to non-agency situations. Does not

			apply when a licensee represents a client in a transaction, but only when a licensee enters into a written agreement that does not involve agency
Iowa	2005	Iowa Code § 543B.56A	At a minimum, **all brokerage agreements** must state that the broker will: - accept delivery of and present offers - assist the client in developing, communicating, negotiating, and presenting offers - answer the client's questions relating to the brokerage agreements and negotiations - provide prospective buyers access to listed properties
Kentucky	2005	201 Kentucky Administrative Regulations 11:045	At a minimum, **all brokers representing a client** must: - accept delivery of and present all offers - accept all earnest money deposits that are presented to the broker - assist clients in developing, communicating, negotiating, and presenting offers - answer questions relating to offers Failure to comply with these minimum requirements is considered gross negligence. Regulations limits choice; interesting that bill proposing minimum services was defeated in 2006. **Allows non-agency** – transaction broker
Missouri	2005	Missouri Revised Statute § 339.780 (7)	In an **exclusive brokerage agreement**, the broker must provide the following services: - accept delivery of and present offers - assist the client in developing, communicating, negotiating, and presenting offers - answer client questions
Texas	2005	Texas Occupations Code Title 7 §1101.557	In an **exclusive brokerage agreement**, the broker must provide the following services: - present offers to and from client - answer client questions
Utah	2005	61-2-27 Utah Code Annotated	In an **exclusive brokerage agreement**, the broker must provide the following services: - accept delivery of and present offers - assist the client in developing, communicating, negotiating, and presenting offers - answer client questions
Enacted before 2000			
California	1987	California Civil Code Section 2079	Listings brokers must **conduct a reasonably competent and diligent visual inspection of listed property**, and disclose all facts materially affecting the value or desirability of the property that that the inspection revealed.
Montana	1995	Montana Code Annotated § 37-51-313 (12)	**Licensees must "endeavor to ascertain** all pertinent facts concerning each property in any transaction in which the licensee acts" so the licensee can fulfill the his or her obligation to avoid error, exaggeration, misrepresentation, or concealment of pertinent facts
South Carolina	*before 2000*	South Carolina Code of Laws Section 40-57-135 (D) (1)	**Licensees must**: - upon receipt, prepare and present offers - deliver written acceptances of offers to all

			parties - ensure that all of the terms and conditions of the transaction are included in the offer - ensure that changes or modifications made during negotiation are in writing and initialed and dated by both parties before proceeding with the transaction.
Wyoming	*before 2000*	Wyoming Code § 33-28-111 (xxix)	**Licensees must:** - advise buyer and seller of all terms of a proposed sale at the time an offer is presented including estimated discounts and closing costs - submit all offers to a seller

[1] For example, the Alabama Real Estate Commission stated that the intent of the 2005 Alabama minimum service law was to avoid sellers that hire a real estate broker from finding themselves left on their own, with no one to answer their questions. Alabama Real Estate Commission Update Newsletter, Fall 2005, at http://www.arec.state.al.us/pdf/Update/arec_update_rev1011.pdf.

[2] MLS refers to the multiple listing service, an agreement among listing brokers to share listings and sales commissions. MLS only means that the seller's property is listed on the MLS and the broker provides no other services.

[3] Examples include FSBO and the development of auction markets for residential real estate: see http://www.williamsauction.com for an example that includes online only auctions.

[4] A customer is a third party involved in a transaction who is not represented by the broker; a broker may provide some assistance to a customer to help facilitate the transaction for the broker's client.

[5] The licensing law in many states has codified these common law duties by statute or regulation. It is important to make the distinction between minimum service laws that increase the brokerage services a consumer must purchase as opposed to laws that define the special agency relationship between a broker and client. Many states have provisions codifying these general common law agency fiduciary duties of obedience, loyalty, disclosure, confidentiality, accounting, and reasonable care; these types of laws are not considered minimum service laws.

[6] (Idaho Real Estate Commission Guideline #23, effective July 1, 2007, adopted January 17, 2008; at http://www.idahorealestatecommission.com/guidelines/guideline23.pdf.)

[7] Under flat fee contracts, the seller is typically responsible for an additional amount: e.g., a percentage of the sales price is paid to the buyer's broker upon completion of the transaction.

[8] In addition to other benefits, such services are logically connected to decreased time on the market. Moreover, a buyer who has moved out of the area is likely to need full services; we control this with a variable for the rate of in-migration.

[9] A platform is an institution or set of institutions that bring buyers and sellers together for a transaction at a market price. Real estate examples include an auction market (including online only auctions available at http://www.williamsauction.com), FSBO using an internet site and the MLS.

[10] See Todd, P.E. "A Practical Guide to Implementing Matching Estimators" Unpublished Manuscript, at http://athena.sas.upenn.edu/~petra/papers/prac.pdf.

[11] See Becker and Ichino (2002) for discussion of various methods.

[12] See Pancak (2008) and Nanda and Pancak (2010) for a description and analysis of the state statutes.
[13] Model (1) is based on binary choice specifications as in Nanda and Pancak (2010). The first stage regresses the law dummy on a number of institutional and economic controls: rebate law, non-agency law, pre-licensing hour and continuing education requirement, licensee fees, industry strength, association strength, house price growth, income growth, vacancy rate, in-migration, 1-period lagged transaction, 1-period lagged licensee/100 households, and a dummy for large metro area in the state.
[14] See Baltagi (2008) and Roodman (2009) for a discussion.
[15] ARELLO (1999-2009), "HOURS PRE-" heading.
[16] ARELLO (1999-2009), "# members" heading and "# Industry Members" heading. For California: The Governor appoints Real Estate Commissioner, who then appoints the Real Estate Advisory Commission 10 in total, six real estate brokers (industry members) and four public members - http://www.dre.ca.gov/pdf_docs/ref01.pdf. For Minnesota: We do not find any type of board or commission. The Governor appoints the Commissioner of the Dept. of Consumer Protection, who oversees all real estate licensing activities. We assume zero percent industry representation in the board.
[17] Data on NAR membership from National Association of REALTORS®, Inc. monthly membership report for years ending December 31, 1999 - 2008.
[18] ARELLO (1999-2009), "SALESPERSONS: Active Salespersons" and "BROKERS: Active Brokers" plus "BROKERS: Active Associate Brokers".