

The Future of the US Residential Real Estate Brokerage Industry in Light of the Internet and International Indications

By

Natalya Delcoure, Ph.D.
Department of Finance and Economics
LA Tech University
office (318)257-2916
Email: ndelcoure@yahoo.com

and

Norm G. Miller, Ph.D.
West Shell Jr. Professor of Real Estate
404 Lindner Hall, CBA
University of Cincinnati
Cincinnati, OH 45221-0195
Office: (513) 556-7088
Email: norm.miller@uc.edu

Preliminary April 24, 2001 Draft

Please do not quote or reference without author permission.

Abstract: The US residential brokerage industry has seen real commission rates and agent incomes rise over the past several decades while percentage commission charges remained relatively stable within local markets. Access to the Multiple Listing Services (MLS) and strong industry interdependency helped to maintain this system. Yet, new open MLS listing services are starting to encourage commission price competition and break down some of the market information monopoly once held by the local trade associations. This has opened the door to a potential revolution in the residential brokerage industry that will likely lead to a more efficient industry with fewer agents doing more transactions and providing a variety of ala carte services to consumers. International commission rates and agent productivity provide some evidence of the transformation that might occur over the next few decades as new consumer options evolve. International commission rates also provide further evidence that fees in the United States are likely to come down over the next several years.

The Future of the US Residential Real Estate Brokerage Industry in Light of the Internet and International Indications

Introduction

Most U.S. residential real estate brokerage firms charge single-family home sellers 6% or 7% of selling price depending on the region.¹ Agents seem to compete for business on every dimension except price (commission rates) with claims of faster sales or higher selling prices or “better service”. This relative uniformity of commission rates within local markets, the ease of entry into the industry and the relatively few sales per agent in the USA compared to other industrialized countries has encouraged debate over the efficiency of the industry. International comparisons and new internet based services also beg the question: “What would happen if U.S. brokers competed on price?”

Debate over the efficiency of the residential real estate brokerage (RREB) industry has echoed through the literature since the late 1970's. If the RREB industry is deemed grossly inefficient the implication is that over time, with new innovations, commission rates (service prices) would come down and/or services would increase or improve. On the side arguing for general efficiency are Lewis and Anderson (1999), and Anderson, Lewis and Zumpano (1999). On the other side are Miller and Shedd (1979), Crockett (1982), Wachter (1987), Yinger (1981) and others. A key premise behind those arguing for inefficiency is the assumption of fairly uniform imitative commission pricing within

¹ Homebuilders, as repeat customers with multiple listings, often pay 5%.

local markets for similar property types.² A rare exception to this widely held belief is presented by Carney (1982).³

Rather than use the USA history of somewhat uniform commission rates as the only evidence on “market” or long term equilibrium commission rates it is interesting to compare brokerage costs in other countries.⁴ Globally we see much lower residential commission rates in most of the other highly industrialized nations including United Kingdom (UK), Singapore, Australia and New Zealand. See Exhibit 1: International Commission Rate Comparisons. For example, in UK the commission rates run less than 2% on average but then the seller is often required to pay for some advertising costs up front without a contingency dependent on a successful sale as would be the case in the US. In Singapore the commission rates also tend to run 3% or less. It is hard to argue that communication technology or real estate public information and record access is any more efficient in non-US countries that would lead to lower commission rates.

² Note that imitative pricing may not require collusion, as would typically be the case with fixed pricing. The market enforcement mechanism will be explained later in this paper.

³ See Michael Carney, “Costs and Pricing of Home Brokerage Services” *The AREUEA Journal*, Fall, No 3., 1982, p.331-354.

⁴ Naturally commission rates in other countries alone will not be sufficient evidence of long term equilibrium unless we also control for differences in services provided. Such a study is beyond the scope of this paper although attempts have been made to collect such information.

Exhibit 1 International Commission Rate Comparisons

Country	License	Real Estate Transaction Characteristics	Compensation	Typical Sales Per Agent	Internet Impact
Argentina**	yes	6%, where 3% paid by the buyer, and 3% paid by the seller; does not require buyer broker.	commission	n/a	n/a
Australia	yes	5% on the first \$18,000, 2.5% -thereafter; also properties are sold through auction system; advertising is provided by real estate agent.	commission & auction	30	no significant impact
Belarussia	n/a	6%-15% commission, averaging near 10%. Public information is scarce.	commission	n/a	n/a
Brazil	yes	5% commission, less on a higher priced units.	commission	n/a	n/a
Canada	yes	3-6% commission rate.	commission	30-50	no significant impact
Caribbean***	yes	5% - Jamaica, 3-5% - Trinidad & Tobago.	commission		n/a
China**	yes	No set regulations and standards for real estate transactions.	n/a	n/a	n/a
Denmark**	yes	2-4%, buyer pays 25% of sales price transfer tax; advertising is provided by real estate agent.	commission	n/a	Large impact on MLS
Finland	n/a	Fees run about 5% of the sale price on condos and 3%-4% - on a single family home. Higher priced houses have lower commission fees. Also, government collects value added tax (22% of the selling price).	commission	n/a	n/a
France**	yes	Only 50% of property listed with real estate agents; real estate transactions are kept very private; 50% of real estate is sold FSBO.	commission	n/a	MLS is encouraged
Indonesia**	no	5% paid by either buyer or seller, but not both; buyer broker is required for real estate transaction.	commission	n/a	n/a
Ireland**	yes	In cities - 1.5-2%, small towns - 2-3%; also properties can be sold through action system.	commission & auction	n/a	n/a
Italy**	yes	Paid by both buyer and seller: each party pays 2-3%.	commission	n/a	n/a
Japan**	yes	3% commission rate.	commission	n/a	n/a
Malaysia**	yes	3% on the first \$100,000 and then 2% of the remaining amount of the sale, commission is paid either by buyer or seller, not both.	commission	n/a	n/a
Mexico**	Varies	5-10% commission rate.	commission	n/a	Large impact on MLS
Netherlands**	yes	1.5-2%, broker represents either the buyer or the seller but not both.	commission	n/a	n/a
Norway**	yes	2-3%, broker represents both parties in the transaction.	commission	n/a	n/a
Philippines**	yes	5%, broker represents either the buyer or the seller but not both.	commission	n/a	n/a
Russia	yes	5% to 10% but "net listings" common; advertising is provided by real estate broker/agent; FSBO very common; buyer broker representation is not required.	fee above net	n/a	absolutely none
Singapore	yes	1.5-2.0%, FSBO very rare; buyer broker representation is not required.	commission	20-40	slight - for marketing
Sweden**	yes	5%; commission is paid by seller, 10% commission is charged for lower priced units.	commission	n/a	n/a
United Kingdom	yes	1%-2%; in very competitive areas - 0.5-0.75%; in low priced areas - 3.5%; advertising is provided by real estate broker/agent; buyer broker representation is not required.	commission & auction	60-100	no significant impact
United States	yes	6%-7%; advertising is provided by real estate broker/agent; in 1999 – 6% of the residential real estate transactions were “FSBO” excluding builder sales but the FSBO success rate appears to be climbing rapidly in 2000 and 2001.	Most commission; Some charges flat fees or 2% to 4%	4. 3* while top agents do 20 or more.	Rapidly increasing.

* This number is calculated as Total home sales in 1999 (according to NAR Profile) is 6.5 million. According to NARELLO, in 1999, there were 515,225 active real estate brokers and 980,083 active real estate agents. ** Information is obtained from <http://onerealtorplace.com>

*** Jamaica, Trinidad and Tobago

In New Zealand and South Africa commission rates average 3.14%. The commission rates in less developed countries with no public records and no reliable MLS (Multiple Listing) services such as Russia and Belarussia fluctuate between 5% and 15% with net listings common in Russia⁵. In Indonesia, Jamaica, Sweden, Trinidad, Tobago, and Philippines brokerage fees run around 5%, still beneath the average in the US. The Chinese government is still in the process of developing a regulatory environment and license standards for the real estate industry.

Benjamin, Jud, and Sirmans' (2000) comparison of American and international real estate brokerage firms suggests several noteworthy differences between residential brokerage commission in the U. S. and other overseas markets including agency rules and representation, potential liability and the use of auctions. According to Dotzour, Morehead and Winkler (1998), many developed countries use auction markets for residential real estate transactions, a trend that seems to be gaining interest and market share in the US as well.

Background on the US Residential Brokerage Industry

For years U.S. real estate brokerage firms have operated via strong trade associations, most notably the National Association of REALTORS (NAR). Licensed agents may join the local, state and national association and thereby call themselves a “**REALTOR**” which is a trade registered name only available for use by members who agree to adhere

⁵ Net listings where the broker keeps all of the fees above some minimum price are considered unethical by the National Association of REALTORS in the US.

to a specified code of conduct and pay local, state and national dues. In 1999 there were 760,000 members of NAR and 2,121,918 active and inactive licensed brokers or agents nationally.⁶ The U.S. REALTOR association has been so successful in recruiting members from among the ranks of licensed agents and also providing the historically essential MLS system that few members of the public nor the media understand the difference between a licensed real estate agent and a REALTOR and view these as synonymous.⁷

It is not uncommon for the majority of real estate firms to be small. According to National Association of Realtors (NAR) 2000 Profile of Home Buyers and Sellers, 60 percent of real estate companies have 5 or less employees, and only 4 percent have more than 50 workers. Access to local MLS systems has been critical to small firms who relied on this database in order to both sell homes or to find homes for buyers. Most active agents have access to at least one local Multiple Listing Service (MLS). Some agents join several nearby MLS systems.⁸

⁷ The number of active and inactive national real estate brokers were obtained from NARELLO Digest of License Laws, 1999. Apparently many people keep a license merely in order to serve the easy listing of a relative or easy representation of themselves or friends where they can “earn” a commission split or legal referral fee.

⁶ It is interesting to note that real estate agents in Russia call themselves REALTORs as they believed this terms indicated a person who represented others for a fee as an agent and yet there is no affiliation with the American REALTOR association nor any dominant trade association that provides a standard code of conduct or other MLS services in Russia.

⁸ In larger metropolitan markets like L.A or Atlanta a REALTOR has historically needed to join three or more MLS organizations in order to cover the entire geographic market.

National referral fees running 10% of the full 6% or 7% commission rates are expected when one broker refers a buyer to another agent within their own affiliated network. Franchise firms and affiliated groups have successfully served the intercity consumer demand, especially large corporate businesses, and helped to provide a national network.⁹ Studies by Frew and Jud (1986) and Jud, Rogers and Crellin (1994) indicate a statistically significant positive impact of franchising on revenue-generated process of real-estate companies, and agents' income (Jud and Winkler, 1998).

Traditionally the full commission rate comes from a deduction from the home seller at closing, even if the buyer has his/her own agent. According to a 1999 NAR Survey, only 15 percent of homebuyers rewarded their own agent directly. This helps to allow the buyers' agent to claim that the seller is paying their fee while the sellers agent can always claim that the buyer is indirectly paying for both fees. Reality suggests that both buyer and seller are providing support for the services required.

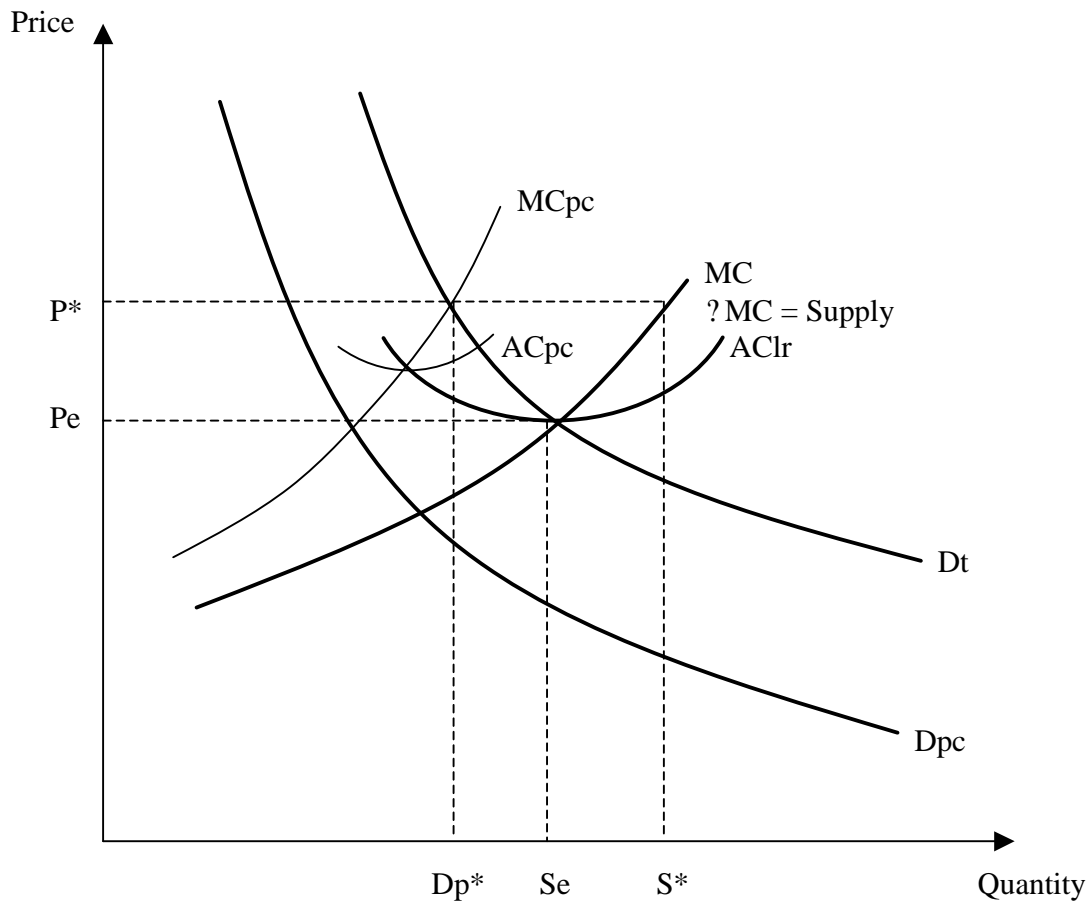
Many local markets observe over 50% of the sales involving two firms or different agents, each representing one party to the transaction. It is customary for commission rates to be shared from the proceeds of the sale of the home.

Exhibit 2 is a theoretical depiction of the demand for and supply of brokerage services comparing perfectly competitive prices to rigid price setting practices. Under perfect competition, price, P_e , is determined by the intersection of the demand curve, D_t , and the long run average cost curve, AC_{lr} . The marginal cost curve, MC , is essentially a

⁹ Prudential, REMax, Coldwell Banker are among the typical affiliated groups that try and capture intercity referrals.

supply curve which mathematically must pass through the minimum point on the average cost curve. The total quantity supplied of brokerage services is limited to the competitively determined supply, Se , since marginal costs exceeded price beyond this point.

EXHIBIT 2
Demand and Supply of Brokerage Services Under Traditional
Co-operative Intensive Commission System



- P^* = actual price or commission rate.
- P_e = long run competitive equilibrium price.
- D_{p^*} = the quantity of brokerage service demanded at price P^* .
- S_e = long run competitive equilibrium supply.
- S^* = actual supply given price P^* .
- D_t = the share of total demand for an individual firm.
- D_{pc} = the share of total demand for a price cutter firm.
- MC = marginal cost curve for an average firm in the industry, the supply curve.
- AC_{lr} = long run average cost curve for an average firm in the industry.
- MC_{pc} = marginal cost curve for an individual firm (in this case that of the price cutter).
- AC_{pc} = average cost curve for an individual firm with marginal cost curve MC_{pc} .

When price is set above P_e , at say P^* , the quantity of brokerage services supplied increases along the marginal cost curve until P^* no longer exceeds MC, at S^* . The difference between S_e and S^* can be referred to as “excess supply” under a market with competitive pricing. Note that excess profits for the average firm will not exist even with a non-competitive price above P_e . Rather the increase in supply absorbs the increased profit margin until $P = MC$ in equilibrium again.

In contrast to the pure long run economic conclusion implied here, we have seen real agent earnings increase as the real price increased indicating the possibility of a lagged response or increasing constraints on supply. (This evidence will be provided in the following section of this paper.) For example, increased educational requirements and associated costs to maintain a license could have forced some marginally productive agents out of the industry over the past four decades reducing the supply of agents.

Excess supply, as depicted here, could not exist except for some enforcement mechanism preventing most firms from charging commission prices below P^* . Take the case of an individual firm, which has marginal cost, MC_{pc} , and average cost, AC_{pc} , curves as in Exhibit 2. Seeing that P^* exceeds MC at the AC minimum, the firm decides to become a price cutter, pc , and lowers the price to somewhere below P^* and above or at $MC = AC$. Normally such a price-cutting move would increase the total demand for the firm’s services and total revenues would increase, albeit with a lower fee per transaction. If such a move increased the price-cutting firm’s demand, other firms would follow suit with similar price moves competitively driving the market-derived price down to P_e . However, when such price cutting behavior reduces the price cutting firm’s share of total

demand as indicated by D_{pc} to a level below AC , then such a price move would mean going out of business.

How the price cutting firm's share of demand can be so detrimentally affected (from D_t to D_{pc}) can be explained by the recognition that a significant portion of D_t involves two cooperating brokers. That is, a firm's share of D_t is not only dependent on the public but to a significant degree on other firms. When a price cutter reduces the commission rate it affects not only its own profit margin on those successful sales but also reduces the portion available for other cooperative firms providing buyers. The shift from D_t to D_{pc} is the result of the loss of cooperative business by the price-cutting firm. When cooperative sales represent a significant portion of the firm's business such price-cutting behavior is not economically feasible. To the extent the firms are dependent on each other to share the total demand for their services **imitative pricing** will be the rule of survival in local markets.¹⁰ The implications of a system where consumers have more control and influence over the search process and where this enforcement mechanism breaks down will be discussed in the last section of this paper.

Uniform prices without consent or collusion among competitors is not in itself illegal. Imitative pricing practices, even as a result of conscious parallelism, may be entirely proper. Even without collusion, the uniform commission rates found in the real estate brokerage industry have been necessitated by the interdependency of the traditionally small brokerage firms. Certainly if real estate brokers or salespersons contemplated or fixed commission rates, either through written or oral agreements, and their conduct conformed to that arrangement, an antitrust violation would exist.

Real Earnings Should Drive Agent Supply

In the absence of price competition for listings we should observe more or less agents entering or leaving the market in response to changes in real inflationary adjusted revenues. Some casual empiricism suggests this behavior is true over the long run, yet greater barriers to entry or to maintaining a license have also increased over the last four decades.¹¹

Home prices have generally exceeded the rate of inflation over the time since 1960 and since commission rates have not declined on a percentage basis during periods when home prices rose faster than inflation the real commission rates have generally increased. The typical real estate agent median gross personal income grew by \$10,000 since 1995 through 1999 with a median at \$43,500 per year (1999 NAR Membership Survey). Real estate brokers income grew 31 percent since 1995 and amounted to a \$63,100 median in 1999.

Exhibit 3a presents the comparison between the cumulative changes in consumer price index (CPI) and mean single-family house price over four decades. According to

¹⁰ In contrast, Anglin and Arnott's (1991) study of residential real estate brokerage supports the collusion hypothesis among brokers and industry behavior.

¹¹ In many states pre-license educational requirements have more than doubled and continuing education requirements (non-existent in 1960) have increased. For example, Ohio requires on average 10 hours of continuing education per year. Other states like, Florida and Alabama mandate 30 to 45 hours of continuing education. At the same time, Vermont obligates their real estate brokers/agents to have 4 hours of continuing education every license-renewing period (every 2 years). According to NAR 1999 Survey, all Realtors have a high school diploma, and more than 40 percent of real estate professionals have a bachelor degree. When pre-license and continuing education standards increased in the U.S., foreign countries pre-license requirements range from high school diploma (Jamaica, Ireland, Japan, etc.) to at least 3 years of college education (Argentina, Australia, Denmark, etc.). Most of the foreign countries do not require post-license continuing education.

the economic data, the changes in the mean single-family house price outpaced the changes in CPI between 1960 and 1999.

The data presented in Exhibit 3b reflect the changes in the number of licensed real estate brokers/agents compared to their annual income between 1960 and 1999. Based on the information provided in Exhibit 3b, we conclude that as per capita real estate broker's income has risen more brokers have entered the industry.

Exhibit 3c represents the changes in CPI, mean single-family house price, number of real estate brokers/agents, and their annual income on the cumulative basis over the last four decades. The presented economic information confirms our previous conclusion that as the mean-single family house price increases over time more real estate brokers/agents enter the industry and compete for the same business, thus it puts downward pressure on their income.

Exhibit 3a. Change in CPI vs. Mean Single-Family House Price (DRI database)

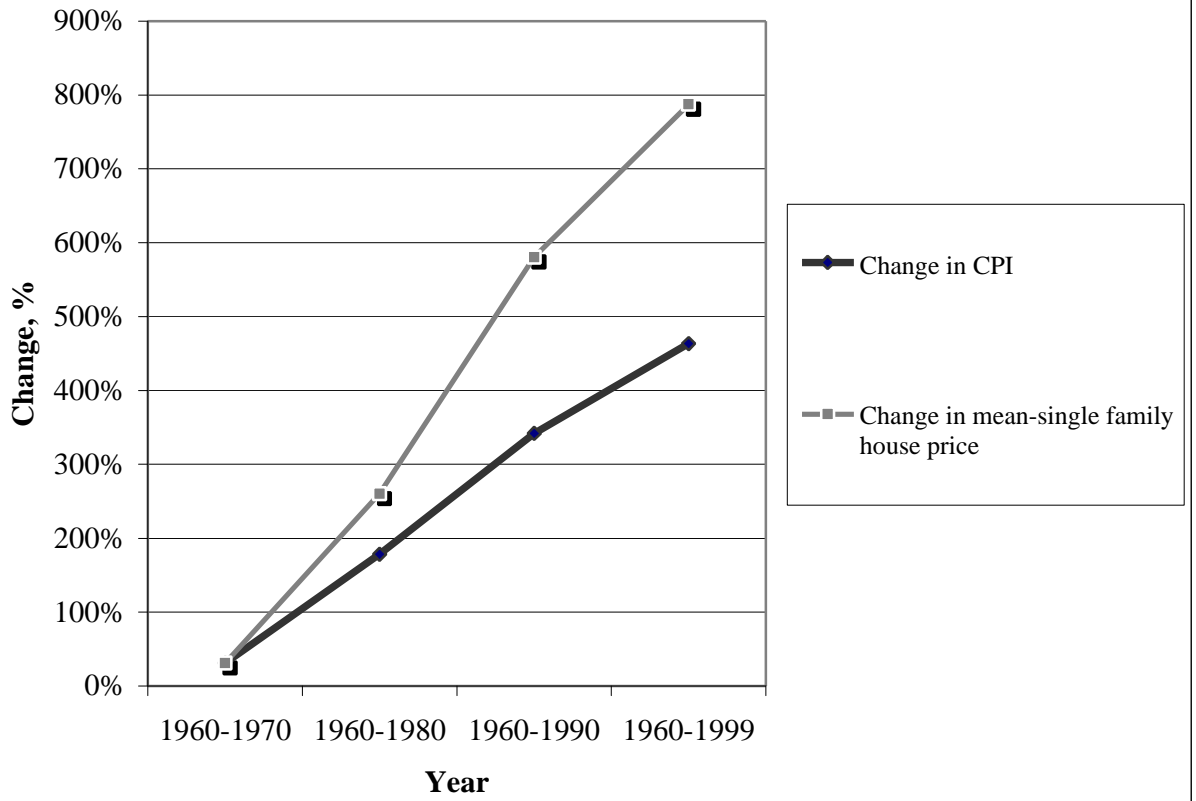


Exhibit 3b. Change in the Number of Licensed Real Estate Brokers/Agents vs. their Annual Income (DRI database)

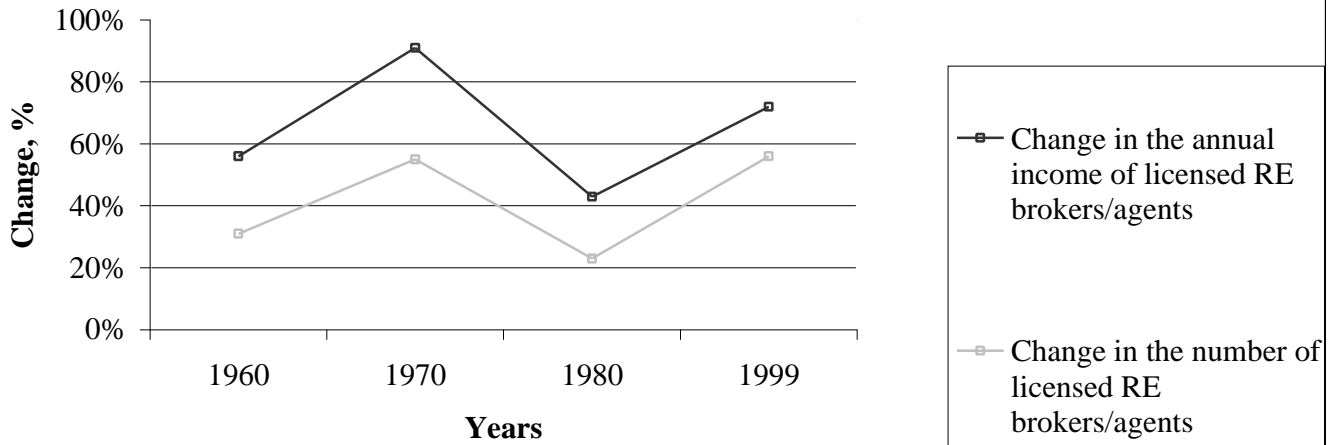
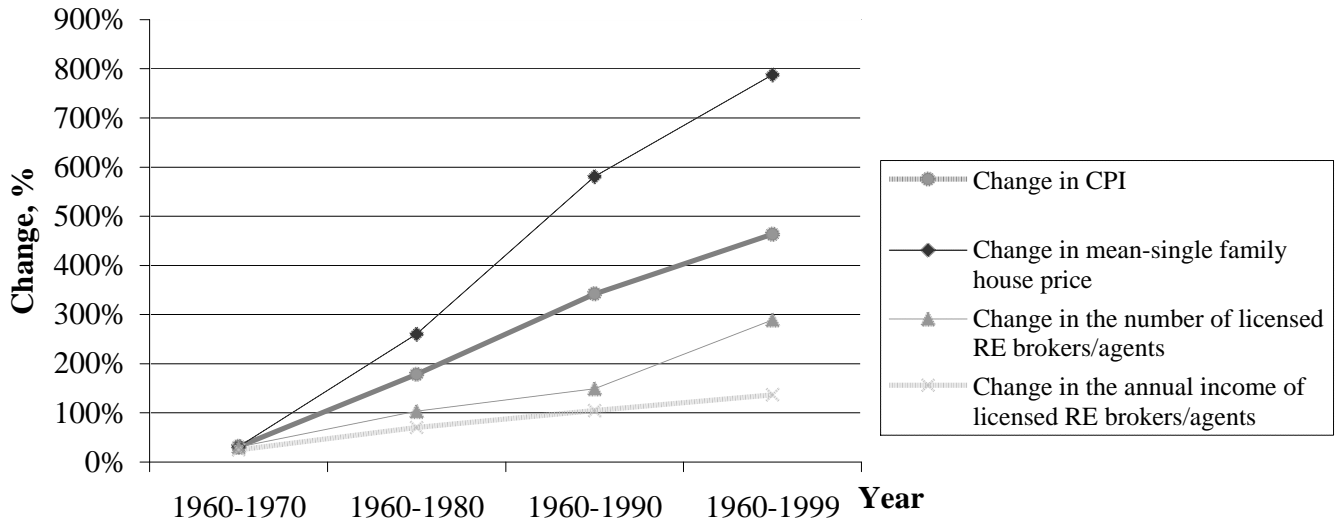


Exhibit 3c. Change in CPI, Mean Single-Family House Price, Number of Licensed RE Brokers/Agents, and their Annual Income (DRI database)



Agency Disclosure and Liability

Until the mid 1980's, few states had a requirement to disclose the typical sub-agency implied by the seller paying a commission to an agent who then split it with the buyer's agent. Technically and in the absence of any contract to the contrary, the buyer's agent became a sub-agent of the seller and could not represent the buyer. Realistically many buyers' agents did represent them and eventually the states started to require an agency disclosure form that led to the growth of buyer brokerage. Today, agents must clearly disclose whom they represent in all states. Since January 1, 1993, NAR changed its listing policy and eliminated the MLS requirement for the selling broker's cooperative buyer's agent to be loyal to the seller. This policy change further encouraged the development of buyer brokerage representation as a player in real estate transactions (Yavas and Colwell, 1999).

Dual agency, where an agent represents both the buyer and seller is not uncommon, thus causing a principal-agent conflict. Academicians have explored the multifunctional role of many real estate brokers since the early 1980s. Marsh and Zumpano (1988) conclude that the growing complexity of the real estate transaction process puts brokers in a situation that makes it impossible to satisfy both parties in the contract. They suggest that the agency conflict that arises from this dual contract arrangement expose real estate brokers to greater liability. Mandatory disclosure of the seller-broker relationship to the buyer at initial meeting helps to mitigate this problem. This may potentially reduce the amount of private information that buyer reveals to the broker, however, it does not assist the buyer in the purchasing decision.

Bajtelsmit and Worzala's (1996) analysis of optimal search and pricing behavior for real estate brokers, sellers and buyers provide some evidence that separate buyer brokers do not help lower purchase price. However, their results are sensitive to market conditions, the bargaining power of the two parties, brokerage compensation method, and standing of buyer broker disclosure.

Though buyer brokerage is a relatively new trend, it has helped to eliminate the information asymmetry where "represented" sellers have greater market information than "un-represented" buyers. Another more recent factor reducing information asymmetry is the Internet that has allowed independent buyer research. This will be discussed in more depth in the last section of the paper.

"Full Service": the Dominant Choice

While there has been a recent trend and some attempts to provide ala carte real estate purchase and selling services it has been the tradition for full 6% or 7% firms to simply claim that they are *full service firms* with no other less expensive option for consumers. Among these services provided to consumers are the following:¹²

On the Sellers side in simplified form:

1. Developing a comparative market analysis that will help the seller evaluate value and listing price or price revisions over time.
2. Suggesting repairs or cosmetic work that will significantly enhance the salability of the property.
3. Exposing the property to other real estate agents and the public via the MLS and personal contacts.

4. Producing an advertising and media plan.
5. Screening potential buyers for qualifications and security risks.
6. Showing the home to agents or direct non-represented buyers.
7. Assisting in the review of offers and negotiation of the contract.
8. Assisting in the resolution of problems and closing details.

Again, “full service” firms do not provide alternative bundles of services, so for example if a residential appraiser says that he/she wants all the services except for the estimate of value, there would be no discounted bundle of services available. If an advertising executive wants to plan and buy his/her own home, marketing media expert or a salesperson wants to show their own home there would historically few less expensive options available from the “full service” firm. Traditional firms also provide a bundle of services on the buyer side including:

1. Assisting in determining the household buying power and affordable price.
2. Assisting in the search for a home and collecting information relative to preferences that will minimize search time.
3. Help negotiate and advise on contract issues.
4. Providing assistance in due diligence to spot problems with the property or arrange for qualified inspectors/experts to review potential physical or legal issues.
5. Help with understanding financing options and mortgage choices.
6. Guide the buyer through the pre-closing and closing process.

Historically, real estate companies in the United States and other industrialized countries served as an intermediary in the real estate contract bringing buyers and sellers together.

¹² Both of the lists below are from www.REALTOR.com but abbreviated here.

However, cultural, economical, regulatory and technological changes all influence the types of services provided and the process of real estate search, evaluation, and contract negotiation as well as closing process. These differences deserve more research so that we might better understand the general efficiency possible not only within the United States but also in less developed countries that lag far behind in the development of a market driven economy. A brief international comparison, focusing on commission rates is provided below.

International Brokerage Comparisons and Trends

The economic, political, regulatory, cultural, and social environments of the different countries are reflected in their real estate industry characteristics. While all developed countries saw increased housing expenditures following an improved economy, the less developed countries experienced a tremendous growth in personal housing investments since the early 1990s. Partially, this trend reflects the improved economic well being of their households, as well as reforms in the regulatory environment that makes property ownership easier. Housing markets are starting to develop in Russia and former USSR states.

What becomes obvious in reviewing the commission rates in foreign countries is that the more efficient, open and reliable the information is within the market the lower are commission rates. Less developed countries with primitive or no MLS system show the highest commission rates reaching 10% or even 15%. This makes sense in a market with information is costly and transactions burdened with high government bureaucracy.

Commission rates also vary by the difficulty of sale or the price level of the home. Lower priced homes have higher commission rates in Sweden, Finland, Ireland, Mexico, and even Belarussia while higher priced homes see lower commission rates, indicating that the cost structure and profitability of selling or buying homes is not linear with respect to price, again an implication that is consistent with competitive markets. Italy, viewed as a developed country, is still faced with a challenging task of developing reliable real estate market information and commission rates are close to the US rates when the buyer and seller commissions are summed. Yet, in general, the commission rates are the least variable with respect to home price, market information, market conditions or inflation over time in the United States.

Most foreign countries call for at least high school education to fulfill license requirements to conduct a real estate transaction; however such countries as Indonesia and Mexico still allow non-licensed real estate practice. Moreover, it is not uncommon for some countries to allow real estate transactions to be processed in strict privacy limiting the extent of full information. For example, in France, only 50 percent of real estate transactions are handled by professional agents because many people wish to keep real estate transfers, transaction prices, and commission fees private. Thus, the For Sale By Owner (FSBO) market is almost half of the total real estate transactions in France.

It is not uncommon for a real estate agent to represent both buyer and seller at the same time, known as dual agency; however, there are some countries that call for a buyer broker in a real estate transaction (e.g. Indonesia, Philippines, Russia, and Venezuela). It appears that the buyer-broker representation is correlated with the government control of real estate and foreign ownership laws. Countries, where real estate markets have

historically experienced bureaucratic abuse, require buyer-broker representation. More developed markets have a regulatory environment in place that facilitates the accuracy of the real estate transfer price and protects both parties in the transactions.

The commission cooperative split policies vary from country to country. It is common for commission fees to be split between buyer and seller agents (e.g. Argentina, Italy) or be paid either by buyer or seller but not both depending on the real estate contracts (e.g. Indonesia, Malaysia, Netherlands, and Philippines). Also, Denmark and some other countries charge transfer ownership sales taxes and require notary participation in the real estate transactions (e.g. Venezuela, Argentina, Mexico, and Italy).

Furthermore, two common types of real estate transaction systems exist in UK, Ireland, and Australia: MLS brokered sales and auction sales. In these markets the public auction system is not viewed as a reserve for the selling of distressed properties. Rather a public auction system is viewed as a positive alternative to the MLS.

The Internet Changes the Real Estate Industry

The early 1990s have changed the way business is conducted in almost all industries. The real estate brokerage industry is no exception. Technological innovation mainly through the change in availability of information and communication technology (voice mail, email, cell phones, PDAs, pagers, etc.) combined with expert systems has prompted a variety of “a la carte” services provided by a new breed of real-estate companies that utilize a national if not global web presence in their business strategy.¹³

According to the 2000 National Association of Realtors Profile of Home Buyers and Sellers, more than 6.5 million homes were purchased in 1999 compared to 6.2 million homes in 1998. In 1999, 37 percent of homebuyers used the Internet as a key information source in their home search, which is a 19 percent increase from 1998. We can speculate that this trend has continued and that more potential buyers expect to see homes on the internet, often with a home tour option, prior to setting out in a car to be driven around town.¹⁴ On the positive side for consumers, a lot of search time is saved. The customer has been empowered with full control over the early part of the search process. On the negative side for agents, captive car time is where the skillful agent can pre-qualify a buyer, hone on their priorities and develop a relationship that might evolve into loyalty on the part of the consumer.

¹³ Worzala and McCarthy’s (forthcoming) findings indicate that “unique products, high level of services...” and Internet presence are important business strategies. Arthur T. Cox in “The Use of the Internet by Iowa Real Estate Licensees” presented at ARES 2001 meetings in Idaho suggests rapid and increasing use of technology by real estate firms. Jud, Winkler and Sirmans in “The Impact of Information Technology on Real Estate License Income” also presented at ARES in 2001 suggest a positive relationship between broker income and the use of technology.

¹⁴ The dominant video tour provider is currently IPIX at www.ipix.com.

It appears that in the U.S., despite, the fact that four out of five homebuyers used real estate agent as an information source in their real estate purchase process in 1999, real estate industry is becoming more Web-based. In 1999, at least one third of real estate professionals had a Web page or an e-mail address. More than 50 percent real estate companies had a Web presence in 2000 and nearly 70 percent report having generated business from the Internet. The percentage of FSBO (For Sale By Owner) listings on various private vendor web sites also appears to be growing. In 1980, some 15% of all homeowners tried to sell their own home and few were successful.¹⁵ According to www.owners.com web-site, more than 1 million American sold their houses in 2000 by themselves and surveys indicate that the FSBO rate is approaching or exceeding 20%.

Benjamin, Jud, and Sirmans (2000) suggest that growing use of the Internet in all stages of real estate process will have a dramatic impact on information diffusion and economies of an MLS. Baen and Roulac (1998) state that technological changes have a tremendous affect on how real estate is sold and bought. Due to the mounting impact of technological innovations and increasing competition from real-estate e-Tailers, changes in legal and regulatory framework, accessibility of a wide range of information directly to consumers, Baen foresees continued pressure on brokerage fees and commission, and performance efficiency and economies of scale. Guttery, Baen and Benjamin (2000) speculate that information technology and greater efficiency in the matching of buyers and sellers will lead to fewer active sales agents. Muhanna, (2000) suggest lower commission rates will occur. Turnbull's (1996) re-examination of fixed commission rates and market efficiency of real estate brokerage companies implies that in order to

¹⁵ This is based on an survey by the author in 1982.

stay in business and be competitive traditional real estate firms have to engage in non-price competition with services that are valued by their clients. However, the author leaves unexplained the issue of the uniform commission rates among real estate companies and the long-term persistence of economic profit.

Yavas and Colwell (1999) conclude that changes taking place in the real estate industry in the context of the information revolution may encourage the development of new forms of MLS systems. They speculate that the new form of MLS will look more like an "Internet bulletin board." Access cost of this bulletin board will be very low, thus for traditional real estate companies stay in business, they must develop and implement new types of brokerage contracts, and make the Internet their ally in order to effectively compete with on-line multi-service real-estate brokerage e-Tailers. Guttery, Baen and Benjamin (2000) in their analysis of the effects of technology changes on real estate brokerage reach a similar conclusion.

Yet, many dot.com brokerage firms have tried unsuccessfully to serve the consumer with on line service and little more. For example, the original concept by "Homes That Click" started in early 1999 was that they would list the home for 2% providing 1% to the coop agent.¹⁶ The home would be entered into the MLS and also a promoted web site. Among the features developed by Homes That Click, beyond a virtual tour arranged through IPIX, was a nice scheduling system where sellers would post possible showing times and prospective buyers could requests possible viewing times and email was used to confirm showing appointments. Neighborhood data, crime data, school information and automated appraisal services through other third party

vendors like www.valueyourhome.com were provided. Such automated neighborhood information, appraisals, and communication systems are an improvement over the multitude of phone calls needed for the typical agent to arrange a showing.

Yet, the 2% were insufficient to draw any cooperative agents and this was soon raised to 4% with a 3% offer to cooperative agents. Homes That Click still succumbed to a naive business plan in late 2000. Incumbent firms using technology always have a major advantage over new comers, and some of the more efficient systems and services could just as easily be provided by traditional firm as by a cyber broker.

Successful incumbent firms embracing the technology of more automated communication and advice to lure and serve customers will gain several efficiencies. Web based programs can estimate affordable prices or market price trends, provide neighborhood information, set up appointments, even transmit contract offers and counteroffers and provide mortgage assistance and much more. Ancillary and complementary services including moving, title insurance, landscaping, property insurance and more can produce referral fees or new profit centers that many large traditional brokerage firms already try to capture, but the web makes it easier to track the flow of information requested and to instantly offer potential services. Traditional firms that will survive have no choice but to embrace all the possibilities for new services and efficiency gains in order to compete in the future. Investments in technology require substantial cash outlays. There are economies of scale to such investments and small firms with no affiliations may not be able to support this investment. Thus, there is a

¹⁶ HomesThatClick.com was started in Cincinnati, Ohio. Many others like ZipRealty.com were begun on the West Coast.

potential for further real estate industry consolidation trends as smaller real estate firms to look for a potential acquirer that will allow them to stay in business.

The MicroSoft Worldwide Real Estate Manager, Daniel Bourgoin, in paraphrased form said on June 13th, 1996 “The residential real estate brokerage industry is one of the most inefficient industries in the United States, and one that MicroSoft hopes to exploit. Many surplus and wheel spinning agents will be out of business in a few years.”¹⁷ Of course, time has yet to prove that MicroSoft will be our primary real estate exchange facilitator through their www.homeadvisor.com effort, one of many similar efforts that use the web as a platform of communication.

One tactic to defend against the new onslaught of cyber brokers is to buy the more successful networks. The consolidation process among traditional and newer real estate companies with a web-presence can be already observed. For example, www.cyberhomes.com web-site links to www.homeadvisor.com, which is owned by Microsoft Corporation. Also, Cendant Corporation owns www.homebytes.com and www.coldwellbanker.com recently acquired www.owners.com. In February 2000, RealEstateVillage.com was bought out by www.homes.com. Homescout.com, homeshark.com and newhomnetwork.com are linked to www.iown.com web-site. Realtor.com, an official web-site of the National Association of Realtors, owns www.homestore.com and www.homefair.com. We simply don't need that many private MLS vendors. Market share is critical in the web world and it is not clear how many private MLS systems can survive.

Benjamin, Jud and Sirmans (2000) suggest that the decrease in real estate agents' liability pushes down commission rates and real estate fees, and makes it easier to enter the industry. Thus, traditional brick-and-mortar real estate companies in order to survive the growing competition from "lean and mean" e-Tailers are pushed towards mergers and consolidations with accelerating investments in technology and human capital (Marsh and Zumpano, 1988; Miller, 1996).

New Cyber Brokers and More Resistance

There are so many new web sites and ventures now in start up phases that it is best to consult aggregation portals that provide directories and ratings of the sites, including: www.ired.com and www.e-realtor.net/ as primary examples. These portals provide links to discount cyber brokers, such as 4Sale-ByOwners.com, FSBOFreedom.com, 1ownerhomes.com, to name a few. Discount web-site brokers allow customers to choose among different property listing fee alternatives, to permit free 24 hour a day access to property listings, a FSBO site index, blank pre-formatted real estate forms and contracts and many other homeowner resources. The listing fees and service options differ significantly. For example, 1ownerhomes.com allows a six months "free" listing.¹⁸ Other typical offers from discount brokers include:

¹⁷ This statement was provided in a speech in Cincinnati to members of the University of Cincinnati Real Estate Roundtable.

¹⁸ Perhaps this is an attempt to draw in market share. It is doubtful that such strategies alone will work unless there is significant effort to expose the web site to potential buyers.

1. A one year ad with 10 photos on the two “leading” FSBO web-sites and their partners for \$79.95 (see www.4Sale-ByOwners.com).
2. One year “deluxe” ads for \$29.95 (see www.4Sale-By Owners.com).
3. A six-month listing for \$35 or enhanced listing plan for \$50 (<http://www.Fizbo Depot.com>).

The promotional prices above might be sustainable with a large share of the market but are not economically feasible for players with small market shares, so it is likely that most of these sites will not survive. At the same time that the cyber brokers are trying to compete on price they are pioneering the use of communication technology with a multitude of high performance platforms that aid the agent and brokerage office, i.e. Software like Offer Manager, Agent Manager, Formulator Software, Chorus, ACT, and Contract Management, Negotiation Pro, etc., that enables virtual negotiations and instant contract formulation. More and more of the traditional agents with traditional full service firms have taken note of the more efficient and faster wireless possibilities.

Many private MLS services do not allow FSBO listings that could offend the traditional firms. For example, www.Homeadvisor.com web-site owned by Microsoft Corporation specifically states that it does not allow FSBO listings. However, there are exceptions. For example, www.owners.com, which has been acquired by www.homebytes.com in October 2000, is the biggest FSBO listing database in the U.S. This mixing of traditional with non-traditional listings, if successful, will benefit the consumer more than the brokerage firm in that their exposure is increased by virtue of the larger listing data base.

Any attempts to compete on the basis of price in any established industry will always be met with resistance. This is natural and many parallels can be found in the insurance, music, and stock brokerage industries. Yet, formal resistance has recently been curtailed when many of the local REALTOR Boards required exclusivity in order to post a listing on their web site and were challenged in court. In 2000, the Justice Department mandated the National Association of Realtors to stop requiring brokerage houses to list exclusively with its web-site, www.Realtor.com.

In December 2000, the Federal Reserve Board and Treasury Department put additional pressure on traditional real estate brokerage by proposing regulation that would permit financial services companies to offer real estate products. NAR announced its opposition to the proposed legislature and conducted a National Survey of 800 adults on February 5-6, 2001. The NAR President-elect Martin Edwards stressed the Association's commitment to oppose the suggested legislature in the best interest of American consumers.

Subtle resistance has generally been more effective in the real estate industry. It has always more difficult to prove that an agent avoids a listing simply because the co-op fee is less appealing than to prove any direct restraint on trade like access to the MLS. This subtle resistance pattern is becoming more of a problem for the agent who has a buyer insisting on visiting a listing with a discount real estate firm after viewing the listing on the Internet. Some speculation on the future of the brokerage industry is discussed next in light of a consumer empowered search process.

The Future of Real Estate Industry

The real estate brokerage industry seems to be undergoing an evolution of great significance. Consumers have become the driving force when performing preliminary research on which homes to consider. More information is available than ever before and virtual touring is becoming the standard expectation among not only the higher end homes but average home listing as well.¹⁹

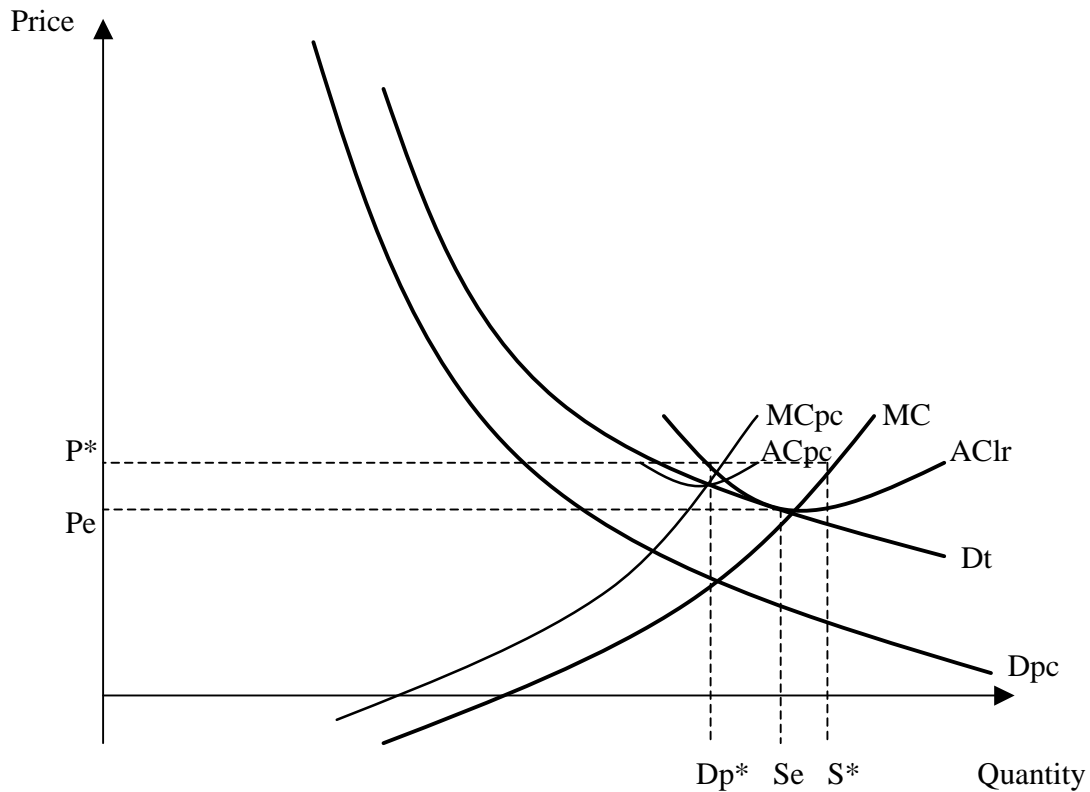
A shake out of a large number of private MLS services into those that are better capitalized or simply better is on going as many of the dot com dreams crash down. If exposure to a large number of consumers is possible through the surviving web sites, similar to the market share dominance observed by web sites like Travelocity and Mapquest, then subtle discrimination and steering of buyers away from discount fee listings will be impossible and true price competition may become more than a passing fad.

The potential gain in business from price-cutting may begin to outweigh the expense of lost cooperation from other brokerage firms. Indeed, a successful break from the common pattern of uniform commission rates, by a few of the larger firms, would trigger a price revolution in the brokerage industry. The economics of a world with less interdependency among brokers to drive business to each other is shown in Exhibit 4 and described below.

¹⁹ Virtual touring benefits the home buyer and seller, helping to reduce search time and helping to reduce the number of wasted showings for the sellers.

EXHIBIT 4

Demand for Brokerage Services With Some Price and Service Competition



P^* = actual price or commission rate.

P_e = long run competitive equilibrium price.

D_{p^*} = the quantity of brokerage service demanded at price P^* .

S_e = long run competitive equilibrium supply.

S^* = actual supply given price P^* .

D_t = the share of total demand for an individual firm.

D_{pc} = the share of total demand for a price cutter firm.

MC = marginal cost curve for an average firm in the industry, the supply curve.

AC_{lr} = long run average cost curve for an average firm in the industry.

MC_{pc} = marginal cost curve for an individual firm (in this case that of the price cutter).

AC_{pc} = average cost curve for an individual firm with marginal cost curve MC_{pc} .

As successful private listing services open up to the public (i.e., www.real.estate.com) buyers will request that they be shown specific homes, even if these are listed by firms who acquired the listing by cutting commission rates. Several Internet based firms, charge fees of 4% or 5% with 3%, the typical co-op fee, paid to any cooperating broker bringing a buyer. Some cyber brokers (depending on the market) charge a home seller 4.5 percent, where the home buyer agent receives 3 percent and the company keeps 1.5 percent.

Prior to e-commerce based brokerage, most discount brokers quickly found themselves out of business, as there was little incentive to show these homes to buyers who might be persuaded to look at other homes. Some discounters provided limited service and were in effect FSBO assistance businesses, helping with advertising and taking phone calls. But the success of consumers using such services has always been fairly modest. Only those homes on major streets, easily spotted by buyers, tended to be successful. But when discounted fee listings can not be subtly avoided some of the discounting firms might find that buyer's agents have little choice but to show their listing.

The move from Dt to Dpc will be less significant. Such an environment would produce more price cutters as a new method to secure listings in the absence of collusion. This could lead to a revolution in the industry with competition on the basis of price, service, and ala carte packaging, moving towards ala carte service options. Below is the same list of major services now offered to sellers by full service firms. We anticipate that once price competition takes hold as a significant factor in gaining market share there will also be a new array of ala carte services provided, such as those described below.

Service Function	Market Price as of 2001	Comments
1. Comparative market value analysis or “CMA report.”	Free to \$250. Some on line appraisals now cost about \$15 but are not that reliable. Better appraisals may cost up to \$250 by a trained professional.	Automated GIS packages like www.valueyourhome.com will be helping agents with CMA presentations. Some firms will do this for free as a “come on” for potential listing opportunities.
2. Suggesting repairs and cosmetic work.	Free to \$250. An experienced agent can make suggestions within an hour or less.	Many agents do not provide much consulting in this area. Others do this as a service once a listing is likely.
3. Exposing the property to agents via networks and the MLS.	\$100 to \$500, based on one to five hours of time.	This involves inserting a listing in the MLS and calling, faxing, or emailing contacts to make them aware of the new listing.
4. Producing an advertising and media plan.	\$100 to \$200 for time plus the cost of the media at \$50 to \$750 plus the cost of video tour at \$200.	Video packages like www.IPIX.com run about \$200. More expensive homes will likely receive more advertising and also more open houses.
5. Screening potential buyers for security to make selling safer.	Free to \$100.	Many agents do little to screen potential buyers prior to an offer, however they may have confidence in a buyer’s broker.
6. Showing the home.	Open houses at \$300 per day. Typically 2 or 3. Other showings (5 to 20) at \$100 each based on a 30 min. tour and transport time.	Most agents are not present when a buyer has their own agent. Open houses may run 3 hours and some of this time might be used to do other things such as making calls.
7. Assisting/advising on contract negotiation.	\$200 per hour for 4 to 8 hours.	Most homes receive only a few offers prior to sale. Complicated contracts may go back and forth a few times and require more expertise, however, traditionally much of this time has been spent running around in a car with a marked up contract. In the future contracts will be transmitted electronically and signed on epads.
8. Assisting in the resolution of problems and closing details.	\$100 per hour for 2 to 20 hours.	This involves calls to keep the closing and inspections moving along and communicate the status to the seller.

It is easy to break down some of the typical agent services and price them separately. Those easy to break down and more likely to see unbundled are the CMA report and showing the home. Showings and open houses alone might cost the professional agent up to \$3,000 or more in time cost on a listing that requires numerous showings, and being able to shift this cost will likely result in a lower commission rate than traditional full service firms charge. Most sellers can be trained (via the internet or video tapes) to show their own homes without becoming defensive and blowing the deal. Other sellers will need this service because they can't afford the time or have other priorities. Much of the time involved in media planning and preparation might start to involve firm specialists who charge professional rates but are faster at this service. Other services are more difficult to separate, but the confident seller might one day find an agent willing to charge an hourly rate plus direct and administrative costs for video tours and media buys.

It is also easy to see where there are potential efficiency gains for the agent. CMA report generation will be handled in part by expert software and web based data. Another area of inefficiency is the contracting process. This includes the contract generation, modification, transmission and even signature. Traditional communication is rather cumbersome in this regard. For example, a buyer wants to make an offer to a seller and could use a web based (fee) service to guide them through the generation of an electronic contract offer with many tips and suggested language phrases built into the system.²⁰ Then the buyer could send this to a seller directly. Sophisticated buyers and sellers might be comfortable reviewing their own

²⁰ Such systems are now being developed at contract storage and management services.

contracts with or without the aid of an expert system software package. Others might want a copy sent to their agent for review and this could and should be done electronically. But, the typical agent today still fills out a number of form contracts and then drives or carries these to the sellers' agent who then must drive or courier the contracts to the seller. A counter offer involves the same process in reverse with physical transmission of the contracts through the agent in nearly every case. Clearly, the technology is available today to speed up this process and make it more efficient, saving agents' time and increasing their productivity.

Beyond ala carte services and a menu of packages for consumers, there are several other implications of price competition on the real estate brokerage industry. One implication is that lower priced homes should see higher commission rates relative to higher priced homes. Lower end homes might require commission rates in excess of 7%, even 10%, if they are not in very marketable condition. This might explain why some more productive agents refuse to list lower priced homes and why agents might put forth less advertising, fewer open houses and much less effort into such listings. We should also see more marketable homes and higher priced homes listed at lower percentage commission rates, similar to the practice in the United Kingdom.

The success rate of FSBOs should continue to climb as the number of private MLS web based sites come down and their brand awareness becomes stronger.²¹ It is

²¹ No more than 5 to 10 private side USA based MLS systems are likely over the long run as economies of scale and natural efficiencies combine with consumer resistance to using so many different web sites. Links between affiliated sites might help to maintain multiple sites as long as the integration for consumers is seamless. Fewer FSBO web sites implies a higher success rate as the survivors become more effective.

not unrealistic to expect this to reach upwards of a third or more of all home sellers, showing and selling their own home with modest assistance. They will incur charges that are primarily related to web based media distribution and some contracting and closing costs, paid directly to specialists, but these will be far less than the traditional full service firm commission rate.

Last, the traditional brokerage firm, with more automated services and expert systems serving both consumers and agents, will likely provide a range of service packages where even the full service package costs something closer to 5% or less, within the next decade and possibly 2% to 3% within the next two decades. These expectations can be inferred from the competitive fee pricing that is observed in many developed nations, where agents make as much or more than they do in the U.S. but there are certainly fewer agents. A drop in the commission rates to even 3% will likely drive more than half of the existing marginal producers out of the industry. This is likely to result in a more professional and experienced agent becoming the norm and this is the greatest benefit of all to consumers from price competition.

References

Anderson R., D. Lewis, and L. Zumpano, "Residential Real Estate Brokerage Efficiency From a Cost and Profit Perspective," *Journal of Real Estate Finance and Economics*, Vol. 20, No. 3, 1999.

Anglin P. M. and R. Arnott, "Residential Real Estate Brokerage as a Principal-Agent Problem," *Journal of Real Estate Finance and Economics*, Vol. 4: 99-125, 1991.

Bajtelsmit V. L. and E. Worzala "Adversarial Brokerage in Residential Real Estate Transactions: The Impact of Separate Buyer Representation," *Journal of Real Estate Research*, Vol. 14, No. ½, 1997.

Benjamin J. D., G. D. Jud and G. Stacy Sirmans "What Do We Know about Real Estate Brokerage?" *Journal of Real Estate Research*, Vol. 20, No. ½, 2000.

Carney M., "Costs and Pricing of Home Brokerage Services," *Journal of the American Real Estate and Urban Economics Association*, Fall, No. 3: 331-354, 1982.

Cox, Arthur T. "The Use of the Internet by Iowa Real Estate Licenssees" working paper presented at ARES meetings, April, 2001, Idaho.

Crockett, J.H. (1982), Competition and Efficiency in Transacting: The Case of Residential Real Estate Brokerage, *Journal of the American Real Estate and Urban Economics Association*, 10(2), 209-227.

Dotzour, M. G., E. Morehead and D. T. Winkler, "The Impact of Auctions on Residential Sales Prices in New Zealand," *Journal of real Estate Research*, Vol. 16, No.1: 57-71, 1988.

DRI database.

Frew, J. R. and G. D. Jud, "The Value of a real Estate Franchise," *Journal of the American Real Estate and Urban Economics Association*, Vol. 14, No. 2: 374-383, 1986.

Guttery R. S., J. S. Baen, and J. Benjamin, "Alamo Realty: The Effects of Technology Changes on Real Estate Brokerage," *Journal of Real Estate Practice and Education*, Vol. 3, No. 1: 71-84, 2000.

Jud, G. D., R. C. Rogers and G. E. Crellin "Franchising and Real Estate Brokerage," *Journal of Real Estate Finance and Economics*, Vol. 8, No. 1: 87-93, 1994.

Jud, G. D. and S. E. Roulac, "The Future of the Real Estate Brokerage Industry" working paper presented at ARES meetings, Santa Barbara, April, 2000.

Jud, G. D. and D. T. Winkler “The Earnings of Real Estate Salespersons and Others in the Financial Services Industry,” *Journal of Real Estate Finance and Economics*, Vol. 17, No. 3: 279-291, 1998.

Jud, G. D., D. T. Winkler and G. Stacy Sirmans “The Impact of Information Technology on Real Estate Licensee Income” working paper presented at ARES, Idaho, April, 2001.

Lewis, D. and R. Anderson “Is Franchising More Cost Efficient? The Case of the Residential Real Estate Brokerage Industry,” *Journal of Real Estate Economics*, Vol. 27, No. 3: 545-560, 1999.

Marsh G. A. and L. V. Zumpano “Agency Theory and the Changing Role of the Real Estate Broker: Conflicts and Possible Solutions,” *Journal of Real Estate Research*, Vol. 3, No. 2, 1988.

Miller N. G. “Telecommunications Technology and Real Estate: Some Additional Perspectives,” *Real Estate Finance*, summer, Vol. 13, No. 2: 18-25, 1996.

Miller, N.G. and P.J. Shedd, “Do Antitrust Laws Apply to the Real Estate Brokerage Industry?” *American Business Law Journal*, Vol. 17/3, Fall, 1979.

Muhanna, Waleed A. (2000), E-Commerce in the Real Estate Brokerage Industry, *Journal of Real Estate Practice and Education*, 3(1), 1-16.

NAR Membership Survey, 1999, <http://nar.realtor.com>.

Roth, K., “The 2000 National Association of Realtors Profile of Home Buyers and Sellers,” National Association of Realtors, www.nar.realtor.com, 2000.

The 1999 National Association of Realtors Membership Survey, *National Association of Realtors*, 1999. The 2001 National Survey of 800 Adults conducted on February 5-6, 2001 on Behalf of the National Association of Realtors.

Turnbull, G. K. “Real Estate Brokers, Nonprice Competition and the Housing Market,” *Real Estate Economics*, fall, Vol. 24, No. 3: 293-304, 1996.

Worzala, E.M. and A. M. McCarthy, “Landlords, Tenants and E-commerce: Will the Retail Industry Change Significantly?” *Journal of Real Estate Literature*, forthcoming.

www.1ownerhomes.com

www.4Sale-ByOwner.com

www.coldwellbanker.com

www.cyberhomes.com

www.e-realtor.net.

www.FIZBODepot.com

www.FSBOFreedom.com

www.homeadvisor.com

www.homebytes.com

www.homefair.com

www.homes.com

www.homeshark.com

www.homesthatclick.com

www.homestore.com

www.iown.com

www.ipix.com

www.ired.com

www.newhomenetwork.com

www.onerealtorplace.com

www.owners.com

www.realestatevillage.com

www.realtor.com

www.valueyourhome.com

www.ziprealty.com

Wachter, S.M., "Residential Real Estate Brokerage: Rate Uniformity and Moral Hazard," *Research in Law and Economics series*, Greenwich, CT and London JAI Press, Vol. 10: 189-210, 1987.

Yavas, A. and P. Colwell, "Buyer Brokerage: Incentive and Efficiency Implications," *Journal of Real Estate Finance and Economics*, Vol. 18, No. 3: 259-277, 1999.

Yinger, J. (1981), A Search Model of Real Estate Broker Behavior, *American Economic Review*, 71(4), 591-604.

Zumpano, L.V., Elder, H.W. Elder and G.E. Crellin (1993), The Market for Residential Real Estate Brokerage Services: Costs of Production and Economies of Scale, *Journal of Real Estate Finance and Economics*, 6(3), 237-250.