

# Seller versus Broker: Timing of Promotion

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**Abstract** Sellers and brokers may differ in preferred timing of costly promotion. Sellers with holding costs are anxious to sell. Sellers with showing costs want a slower approach. The findings indicate that a standard listing contract where the broker chooses promotion timing can be efficient if sellers have no significant holding or showing costs. The efficient listing contract provisions are delineated for duration and fee structure for sellers who have holding and/or showing costs.

## Introduction

As a broker, how do you decide when to initiate costly promotion to protect your interests while still serving the seller? As a seller, how do you know if the broker is timing promotional activity to sell your property in your best interests? These issues are central to a broker-seller relationship, yet little research has been directed toward the timing of promotion.

This study addresses potential conflicts between a seller and a broker on the timing of real estate promotions. The broker may prefer to stagger costly promotion over the life of a listing contract hoping that minimal promotion will attract a buyer. The broker can then collect her commission and spend little on marketing. But does this match well with the seller's interests? On the one hand, anxious sellers may want brokers to aggressively market their property so that it can be sold as soon as possible. In this case, the broker is seen as spending too little too late. On the other hand, sellers with high showing costs may prefer minimal promotion, hoping that only high likelihood buyers will be attracted. In this case, the broker is seen as spending too much too quickly. So what is the appropriate course of action for the broker?

The contribution of this article is to discuss two factors that impact the optimal timing for promotion by brokers and sellers: the nature of the marketing strategy and the type of seller. A search model is presented that explores promotion as a means for a one-time increase in the arrival rate of buyers. In contrast to previous literature where increased broker effort permanently increases the probability of sale, the benefit of a promotional event declines as time passes. The model further incorporates seller holding costs and costs of showing. Finally, the conditions are

specified for when the broker chooses the most efficient timing for promotion and when it may be necessary for the seller and broker to negotiate the timing of the promotion prior to signing a contract.

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## Literature Review

Article 1 of the NAR's code requires that: "When representing a buyer, seller, landlord, tenant, or other client as a broker, REALTORS® pledge themselves to protect and promote the interests of their client." The real estate broker is supposed to only take actions that benefit the principal. However, brokers may prefer to take actions that benefit themselves.

### *The Nature of the Marketing Strategy*

To date, the literature has used search models to study agency problems in the marketing of real estate that fit well with a "push strategy." In traditional marketing, manufacturers use retailers, distributors and/or agents to "push" a product to the end user through promotions and incentives directed at the agent to induce more extensive selling activities. Similarly, a broker uses a push strategy when the focus is to try and sell a property through personal contacts with potential buyers as well as a network of other brokers. In this case, the broker contacts other brokers to show the property, encourages current clients to view the property, etc.,—all activities that push the property to potential buyers who may or may not be seeking that specific type of property. A key assumption of the previous literature is that increases in broker effort result in an increased probability of a match between a buyer and a seller throughout the life of the listing contract.

In contrast, promotion is typically a "pull strategy." The goal of promotion is to attract, or "pull," additional people into the pool of potential buyers for the property. In traditional marketing, pull strategies often involve an advertising campaign that makes potential buyers aware of and interested in the product. For most products and services, advertising is used to build awareness and loyalty for a brand. The effect of any one advertisement decreases over time, which is why most companies have ongoing campaigns for the life of the brand. Real estate differs from this model in one fundamental aspect: a property is a one-time sale to one buyer. Promotion is not used to build awareness and loyalty for a property since a property disappears from the market as soon as it is sold. Once the dollars are spent, the advertisement has run, and the pulled consumers view and reject (or buy) the property, the effect of the promotion is over. This effect of promotion is distinctly different from the broker's effort as described in the literature. While increased broker effort always increases the probability of sale, promotion (*e.g.*, a listing in the Multiple Listing Service (MLS), a spot in a real estate guide or an ad in the local newspaper) adds a temporary base of potential buyers. As a result, promotion, or pull, activities require a modified approach to the standard search model.

*Research on the Impact of Broker Effort (Push)*. The problem of whether a standard listing contract motivates desired broker effort is referred to as moral hazard with hidden actions in game theory. In a game of moral hazard with hidden actions, players start with symmetric information and agree to a contract. Subsequently, one player can take some action that cannot be observed by the uninformed players. For example, after listing with a real estate broker, the seller faces a moral hazard problem for the individual cannot observe the effort level of the broker. The seller may benefit from additional broker effort (sell the real estate at a higher price or more quickly). However, additional effort can be costly to the broker. The broker may be better off avoiding costly effort. A conflict may arise between the seller's best interests and the broker's preference to avoid work or additional expenses.

Early studies examine the effectiveness of standard listing contracts in motivating unobservable broker effort. The incentive effects of flat-fee and percentage commissions are explicitly examined in Zorn and Larsen (1986). They recognize that a moral hazard problem may arise in the choice of price and broker effort. The authors show that both the percentage-commission and flat-fee systems induce the broker to search less intensively than the amount desired by the property owner.

Knoll (1988) recognizes that sellers may face an opportunity cost of property ownership that varies directly with the price of the property. As such, the gain from selling the property sooner varies in proportion to the sale price, and this gain motivates the desire for a higher level of brokerage services to increase the probability of sale. Knoll's observation enables him to provide justification for the prevalence of percentage commissions.

Miceli (1989) recognizes that most agency agreements specify a limited duration for which the listing is valid. In a dynamic setting, Miceli argues that the duration of an exclusive listing contract can be used to overcome moral hazard. The limit on the length of the listing contract may more closely align the broker's interests with those of the principal.

Anglin and Arnott (1991) note that observed real estate brokerage listing contracts are much simpler than the incentive contracts that would seem to be optimal from principal/agent theory. Geltner, Kluger and Miller (1992) examine this issue with a simulation analysis to gauge the magnitude of the discrepancy between existing and optimal contracts. They determine that time-incentive listing contracts produce negligible gains over the standard fixed-percentage listing contract.

Prior research has focused primarily on the implications of the broker-seller contract with regard to the push effort put forth by the agent to sell the property. The key factors identified in these studies include consideration of the best timing for the sale, the price of the property and the appropriate incentive for the broker. This study expands this research by looking at the key considerations for a pull promotion strategy.

*Considerations for a Model on Promotion (Pull)*. The model focuses on the impact of promotion, not that of broker effort, on the pool of potential buyers and therefore the probability of sale of the property. Unlike push models of moral hazard with hidden actions, a pull model must be based on observable promotion. An obvious solution is for sellers to simply force the broker to choose the desired timing of promotion. The puzzle this study will try to explain is why this solution is rarely used in practice. Note that standard listing contracts are far more common than that suggested by agency theory (see also Anglin and Arnott, 1991). The prevalence of standard listing contracts with the occasional limitation on contract duration seems inconsistent with the potential issue on the timing of promotion. This study seeks to resolve this inconsistency.

A key consideration in a promotion strategy is how broadly the broker and seller want to define the target market. By nature of the push strategy involved in broker effort, people actively involved in buying a house are the base for the potential buyers. In contrast, promotion may reach more or less interested buyers, depending on the specific promotion used. On one end of the continuum is a mass marketing approach where a firm sells the same product to the whole market, not acknowledging the different needs of buyers. In this approach, almost everyone is considered a member of the target market (Tellis, 1998). A mass marketing strategy pulls in a large pool of potential buyers through wide-reaching media; however, the likelihood of purchase may be low since most of this pool may not be actively in the market for any property, much less the specific property promoted. Examples of this type of promotion in real estate include television and newspaper listings.

At the other end of the continuum is niche marketing where the target market is narrowly defined based on the unique needs and wants for the product. In niche marketing, a firm sells a unique product to a small segment of the market (Tellis, 1998). A niche promotion strategy attracts a smaller pool of potential buyers, yet the probability of purchase is much higher since the product is matched to their specific needs. As a result, niche marketing is often more profitable since it allows the firm to concentrate on a single segment of interested customers, focusing all promotion dollars on the segment most likely to buy the specific property (Churchill and Peter, 1998). The MLS and open houses for other brokers are examples of a niche promotional activity.

Three characteristics of the real estate industry make it particularly appropriate for niche marketing. First, it is highly fragmented, with a lot of brokers and a wide range of properties on the market at any one time. When markets are fragmented, firms are more likely to shift toward niche marketing than mass marketing (Kotler and Armstrong, 1996). Second, potential customers for the real estate industry may have a wide range of actual interest in and intention to purchase a product. The real estate broker does not want to attract consumers with a low need for the product (*i.e.*, just lookers) through her promotion.

These consumers will take time and effort away from more qualified customers and may be more likely to be price sensitive (Krishnamurthi and Raj, 1985). Third, real estate is a search good that is very expensive and high risk. For this type of purchase, a consumer is more likely to rely on sources of information other than advertising, and therefore, advertising (particularly a mass appeal) may be less effective (Assmus, Farley and Lehmann, 1984). As a result, sources that are perceived to be objective, such as the MLS, are more likely to be effective in reaching the interested buyers. Based on these characteristics, the promotional model proposed assumes that niche marketing will be preferred over mass marketing, at least initially, because it will more efficiently reach the target market.

*The Type of Seller: Holding Costs versus Showing Costs.* Sellers may have different needs that make different strategies more or less appealing. Some sellers may face holding costs. For example, a homeowner who has already moved and purchased a new home still has to make payments on the old home. A more likely scenario is that the homeowner could not qualify for a loan on a new home until the old home is sold. Such sellers are clearly motivated to sell their property as soon as possible. These anxious sellers will encourage their brokers to aggressively market the property, and may take the number of people looking at the property as a signal of the broker's effort. Brokers, on the other hand, face the costs of promotion. Brokers know that bringing in more marginal buyers not only increases costs in terms of promotion, but also in terms of effort. An important issue for an anxious seller may be the timing with which the broker will commit to costly promotion of the real estate.

Other sellers may face costs of showing the property. Yavas and Colwell (1999) examine a situation in which a seller incurs a cost each time a buyer inspects the real estate. This may be the opportunity cost of time for showing the real estate or may be a more tangible cost such as damage to the real estate while the potential buyer inspects the real estate. Such costs will likely induce the seller to prefer that fewer buyers arrive to inspect the property than the broker would choose. A seller who faces showing costs only wants to attract buyers with an extremely high likelihood of actually making an offer on the property. This type of seller prefers that the broker focus her promotional efforts on a specific segment of potential buyers.

Previous literature has dealt with the question of whether traditional listing contracts give brokers the appropriate incentives to expend costly effort that benefits the seller via a higher selling price or a shorter time on the market. The seller wants to sell quickly at the highest possible price. However, the broker must trade off the gains of a potentially higher commission against the costs. The seller's wants and the broker's tradeoff rarely coincide. Many papers address the interaction of selling time with the marketing mix elements of price, place (brokers) and to some degree product (heterogeneous real estate). None have studied the relationship between selling time and the remaining element of the marketing mix, namely promotion.

## A Model of Real Estate Promotion

The model considers the implications of the nature of the marketing strategy and the type of seller for the timing of promotion. A search model in which promotion serves as a means for a one-time increase in the arrival rate of buyers is used. It examines initial promotion, such as the MLS, as a niche marketing effort designed to bring in those buyers most likely to be interested in a particular property. Later promotions bring in more marginal buyers, similar to a mass marketing approach. In contrast to a push strategy where increased broker effort permanently increases the probability of sale, the benefit of a promotional event declines as time passes.

The model incorporates the type of seller by looking at the implications for sellers with holding costs as well as those with costs of showing. The impact of these factors on whether the broker will choose the most efficient promotional strategy or whether the broker and seller should negotiate the timing of promotion prior to signing a contract is also discussed.

### Assumptions

The players include a seller who can be of three different types (standard, anxious or patient), a buyer who can be from two distinct segments (niche and mass market) and a broker. All players are risk-neutral with common discount factor  $\delta$  per period.

The seller has reservation price  $R$  for the property. The first type of “standard” sellers faces no significant holding or showing costs. For example, this type of seller may be living in the home and showings can be scheduled while the seller is at work. The second type of seller is classified as “anxious” and faces significant holding costs. This type of seller may have moved into a new home and still have costs associated with the old home. A seller is assumed to only face holding costs if the property is up for sale. If the property is not for sale, the seller can rent the property to cover all holding costs. The third type of seller is classified as “patient” and faces significant costs to show the property. This type of seller may be living in the home and is inconvenienced by showings. Let  $\chi$  represent a seller’s cost of holding the property per unit of time and  $c$  denote a seller’s cost to show the property to a prospective buyer.

The first buyer segment consists of buyers actively searching to purchase real estate. This segment is the target market. Let  $f(V)$  be the pdf and  $F(V)$  be the cdf of the distribution of the private valuation of the target-market buyers for the real estate. The value  $(1 - F(R))$  represents the probability that a single target-market buyer’s valuation exceeds the seller’s reservation price for the real estate. Let  $n$  represent the number of target-market buyers who arrive to inspect the real estate. Assume that  $n$  is a continuous function of time ( $t$ ). The flow rate  $n$  decreases at a decreasing rate with  $t$ , i.e.,  $n_t < 0$  and  $n_{tt} > 0$ . Let  $N$  represent the lump sum cost of promotion to the target market. For example, buyers actively seeking a new home can be reached through a MLS. Assume  $n$  increases with  $N$  over all  $t$ .

The second buyer segment consists of buyers who are not actively searching to purchase real estate. This segment is the mass market. Let  $g(V)$  be the pdf and  $G(V)$  be the cdf of the distribution of the valuation of the mass-market buyers for the real estate. Let  $m$  represent the number of mass-market buyers who arrive to inspect the real estate. Assume that  $m$  is a continuous function of time ( $t$ ). The flow rate  $m$  decreases at a decreasing rate with  $t$ , *i.e.*,  $m_t < 0$  and  $m_{tt} > 0$ . Let  $M$  represent the lump sum cost of promotion to the mass market. Such promotion may include costly advertising in real estate brochures, a newspaper or local television. Assume  $m$  increases with  $M$  over all  $t$ .

This study adopts a common assumption from the marketing literature that the expected benefit-cost ratio of niche promotion exceeds that of mass promotion. Thus, niche promotion precedes mass promotion. This assumption is not necessary to the results. The only requirement is that some form of promotion has a superior expected benefit-cost ratio to some other form of promotion. However, the relevant terminology of niche versus mass promotion from marketing is used to make the presentation clear. Assume that niche promotion reaches only target-market buyers and that it exhausts the available pool of buyers in the target market. There is no dependence of  $n$  on  $M$ . This is a realistic assumption in the real estate market as buyers actively searching can be reached by a broker through the individual's own contacts with target-market buyers as well as through their network with other brokers (including a MLS). As niche promotion precedes mass promotion, mass promotion can only reach buyers in the mass market. There is no dependence of  $m$  on  $N$ . This is also realistic to the real estate market as pull strategies such as newspaper advertising are primarily intended to reach buyers who are not actively on the market.

Assume that a target-market buyer is more likely to purchase a property than a mass-market buyer. This means that:

$$F(R) < G(R). \tag{1}$$

Assume the brokerage market is competitive. A listing contract of duration  $T$  specifies that the broker is paid a fixed-percentage commission rate  $s$  of the selling price to be paid to the real estate broker at time of sale. The assumption of a fixed-percentage commission rate is consistent with previous literature and actual practice. A standard listing contract has fixed duration  $\bar{T}$  and fixed-percentage commission  $\bar{s}$ . Once the listing contract expires, the seller is free to negotiate a new listing contract with either the same or a new broker. Consistent with listing contracts common in the real estate industry, assume that the broker pays for promotion. If the listing contract expires, the broker receives no compensation or reimbursement for promotional expenses.

The broker, as the seller's representative, faces the benefit-cost tradeoff of promotion. Assume that the expected benefit of both niche and mass promotion

exceeds the respective costs. If the seller and the broker are the same person (the broker is selling her own property), then assume the expected benefit of both niche and mass promotion exceeds both the respective costs of promotion and any seller holding and/or showing costs. Otherwise, promotion is too expensive and no buyers will arrive to inspect the real estate. Thus, the real estate will go unsold.

The available pool of buyers includes those readily available in the target market and those that must be pulled into the pool with mass promotion. Let  $t_N$  be the time to niche promote and  $t_M$  be the time to mass promote. Thus,  $\int_{t_N}^{t'} n(N, t_M, t) dt \equiv \eta(t_M, t')$  is the expected number of target-market buyers who will arrive to inspect the property between the time niche promotion begins and time  $t'$ . Similarly,  $\int_{t_M}^{t'} m(M, t_M, t) dt \equiv \mu(t_N, t')$  is the expected number of mass-market buyers who will arrive to inspect the property between the time mass promotion begins and time  $t'$ . Assume that no buyers of either segment will arrive to inspect the real estate if their respective promotional activity is not conducted within the duration of the listing contract. Thus,  $\eta(t_N, T < t_N) = 0$  and  $\mu(t_M, T < t_M) = 0$ .

### A General Model

If there is a sale at time  $t'$ , the seller's payoff is a benefit (the discounted excess of the individual's share of selling price ( $P$ ) over the reservation price) less any holding and/or showing costs. A seller who faces both holding and showing costs has discounted utility ( $U(\chi, c)$ ) given by:

$$U(\chi, c) = [(1 - s)P - R]\delta^{t'} - \int_0^{t'} [\chi + c(n + m)]\delta^t dt. \quad (2)$$

The broker's discounted income ( $I$ ) is the individual's discounted share of selling price less the costs of promotion. This is represented as:

$$I = sP\delta^{t'} - N\delta^{t_N} - M\delta^{t_M}. \quad (3)$$

The seller's problem is to maximize their expected utility ( $E[U(\chi, c)]$ ) by choice of the duration of the listing contract. This is represented as:

$$\max_T E[U(\chi, c)] = \int_0^T F^n G^m [((1 - s)P - R)(1 - F^n G^m) - \chi - c(n + m)]\delta^t dt, \quad (4)$$



subject to the broker's timing of promotion:

$$\begin{aligned}
 t_N, t_M &= \arg \max E[I] \\
 &= \int_0^T F^\eta G^\mu [sP(1 - F^n G^m) - N\delta^N - M\delta^M] \delta^t dt, \quad (5)
 \end{aligned}$$

where  $\eta = \eta(t_N, T)$ ,  $\mu = \mu(t_N, T)$ ,  $F^\eta G^\mu$  is the probability that the real estate goes unsold by time  $t$ ,  $n = n(N, t_M, t)$ ,  $m = m(M, t_M, t)$ , and  $(1 - F^n G^m)$  is the probability that the real estate will sell between  $t$  and  $t + dt$ .

The analysis begins with two preliminary questions. First, should the broker conduct niche or mass promotion first? Second, when should the broker start the first promotion? By assumption, the expected benefit-cost ratio of niche promotion exceeds that of mass promotion. Thus, the broker will always start niche promotion at or before the time she starts mass promotion. Equation (5) clearly shows that the real estate will never be sold without some type of promotional activity. The broker receives no income if there is not some type of promotion. Thus, the broker always chooses to start niche promotion immediately and:

$$t_N = 0. \quad (6)$$

The real issue becomes: When should the broker start mass promotion? Given Equation (6), the seller's problem represented by Equations (4) and (5) reduces to:

$$\begin{aligned}
 \max_T E[U(\chi, c)] &= \int_0^T F^{\eta_0} G^\mu [((1 - s)P - R)(1 - F^{\eta_0} G^m) \\
 &\quad - \chi - c(n_0 + m)] \delta^t dt, \quad (7)
 \end{aligned}$$

subject to the broker's timing of promotion:

$$\begin{aligned}
 t_M &= \arg \max E[I] \\
 &= \int_0^T F^{\eta_0} G^\mu [sP(1 - F^{\eta_0} G^m) - M\delta^M] \delta^t dt - N. \quad (8)
 \end{aligned}$$

where  $\eta_0 = \eta(t_N = 0, T)$  and  $n_0 = n(N, t_N = 0, t)$ .

As a benchmark, the first-best solution is examined. The first-best can be achieved when the seller and broker is the same person (as in Zorn and Larsen, 1986). In the case of a seller/broker, the listing contract is of an infinite duration because the seller/broker owns and brokers the property until the time of sale (as in Anglin, 1994; and Geltner, Kluger and Miller, 1991). The seller/broker seeks to maximize his/her expected utility by choice of when he/she will extend the costs niche promotion or mass promotion is conducted.

The seller/broker's problem is:

$$\begin{aligned} \max_{t_M} E[U(\chi, c)] &= \int_0^{t_M} F^{\eta_0}[(P - R)(1 - F^{\eta_0}) - \chi - cn_0] \delta^t dt \\ &+ \int_{t_M}^{\infty} F^{\eta_0} G^{\mu}[(P - R)(1 - F^{\eta_0} G^{\mu}) \\ &- \chi - c(n_0 + m) - M\delta^{t_M}] \delta^t dt - N, \end{aligned} \quad (9)$$

where  $\int_0^{t_M} F^{\eta_0}[(P - R)(1 - F^{\eta_0}) - \chi - cn_0] \delta^t dt \equiv E[U_{0 \leq t < t_M}(\chi, c)]$  is the expected utility of a seller/broker who faces holding and showing costs during the period  $0 \leq t_M < t$  and  $\int_{t_M}^{\infty} F^{\eta_0} G^{\mu}[(P - R)(1 - F^{\eta_0} G^{\mu}) - \chi - c(n_0 + m) - M\delta^{t_M}] \delta^t dt \equiv E[U_{t_M \leq t < \infty}(\chi, c)]$  is expected utility during the period  $t_M \leq t \leq \infty$ .

The seller/broker will choose not to start mass promotion immediately if:

$$\begin{aligned} \frac{\partial E[U(\chi, c)]}{\partial t_M} \Big|_{t_M=0} &= \frac{\partial E[U_{0 \leq t < t}(\chi, c)]}{\partial t_M} \Big|_{t_M=0} \\ &+ \frac{\partial E[U_{t_M \leq t < \infty}(\chi, c)]}{\partial t_M} \Big|_{t_M=0} > 0. \end{aligned} \quad (10)$$

As  $t_M$  increases, it is clear from Equation (9) that  $E[U_{0 \leq t < t}(\chi, c)]$  increases and  $E[U_{t_M \leq t < \infty}(\chi, c)]$  decreases. Thus, the condition of Equation (10) can be met if:

$$\frac{\partial E[U_{0 \leq t < t}(\chi, c)]}{\partial t_M} \Big|_{t_M=0} > \left| \frac{\partial E[U_{t_M \leq t < \infty}(\chi, c)]}{\partial t_M} \Big|_{t_M=0} \right|. \quad (11)$$

The inequality of Equation (11) will hold if the probability of a purchase by a target-market buyer at time  $t = 0$ ,  $(1 - F^{\eta_0(N, z_N=0, t=0)})$ , is sufficiently large. A sufficiently large probability of a purchase by a target-market buyer at time  $t = 0$

means that the additional expected benefit of mass promotion is less than the additional expected cost of mass promotion at time  $t = 0$ .

The seller/broker's expected utility due to niche promotion declines over time:

$$\frac{\partial E[U_{0 \leq t_M < t}]}{\partial t} = \int_0^{t_M} F^{n_0} \ln F \left[ \frac{\partial \eta}{\partial t} [\cdot] - \frac{\partial n_0}{\partial t} [F^{n_0}(P - R) + c] \right] \delta^t dt < 0.$$

Thus, there exists some optimal time for the seller/broker who faces holding and showing costs to start mass promotion ( $t_M^*(\chi, c)$ ) given by:

$$t_M^* = t_M : \frac{\partial E[U(\chi, c)]}{\partial t_M} = 0. \tag{12}$$

In the first-best solution, the seller/broker will choose to start mass promotion at the time that the number of target-market buyers arriving to inspect the real estate has declined to the point that it is cost effective to promote to the mass-market buyers.

As the optimal time to start mass promotion ( $t_M^*(\chi, c)$ ) of Equation (12) results in the highest possible shareable surplus between the seller and broker, Equation (12) is also the socially efficient choice of the time to start mass promotion.

### The Model with No Seller Holding or Showing Costs

Consider the “standard” type of seller who incurs no costs for either holding the property over time or showing the property to prospective buyers. Let  $E[U]$  represent the expected utility of a seller with no holding or showing costs, the socially efficient solution of Equation (12) reduces to the seller/broker choosing the optimal time to start mass promotion ( $t_M^*$ ) as:

$$t_M^* = t_M : \frac{\partial e[U]}{\partial t_M} = 0. \tag{13}$$

In a competitive brokerage market, the standard fixed-percentage commission must be Pareto efficient. If not, then some broker would have an incentive to offer better terms to the sellers. The efficient solution of Equation (13) offers the maximum

surplus ( $P - R$ ) that the seller and broker can share. As the broker's commission ( $sP$ ) is some fraction of the surplus, the seller may be able to choose terms of the listing contract that make them better off while the broker is no worse off. In the case of a "standard" seller, the broker bears the cost of promotional activities but only receives a portion of the benefit of promotion. There are two possibilities for the seller to fashion a contract that induces the broker to internalize the full benefit of promotion. The seller can direct the timing of promotion or choose the duration of the listing contract. Propositions 1 and 2 address the conditions under which a standard listing contract may be efficient when the seller has no costs associated with selling the property.

*Proposition 1: If a seller faces no holding or showing costs, a listing contract where the seller chooses the timing of promotional activities neither serves the best interests of the seller nor is it socially efficient.*

Proof: A seller who directs the timing of promotion (represented by  $t_M^S$ ) would maximize the expected utility:

$$\max_{t_M} e[U] = [(1 - s)P - R] \int_0^{\infty} F^{n_0} G^{\mu} (1 - F^{n_0} G^m) \delta^t dt. \quad (14)$$

Given any standard fixed-percentage commission rate  $\bar{s}$ , Equation (14) shows that the seller will direct mass promotion to start immediately ( $t_M^S = 0$ ) because the individual faces no costs of doing so and would choose to avoid waiting costs. Clearly, the seller wants  $[(1 - \bar{s})P - R]$  to be as large as possible. The optimal  $\bar{s}$  for the seller is achievable when the difference between shareable surplus and broker costs are the highest. Given common discount rates, the difference is at its maximum when mass promotion is started at the time  $t_M^*$  given by Equation (13). Sellers would like to sign listing contracts that specify the optimal  $\bar{s}$  and allows them to direct the start of promotion. However, brokers know that sellers will want to start promotion immediately. Competitive brokers will not be willing to accept the seller's optimal  $\bar{s}$  since brokers would expect losses given the additional costs of allowing sellers to choose the timing of promotion. The end result is that the expected payoff to the seller who can choose the timing of promotion is less than optimal.

Next, the situation in which the seller can choose the duration of the listing contract is discussed.

*Proposition 2: If a seller faces no holding or showing costs, a listing contract where the broker chooses the timing of promotional activities and the seller chooses the duration of the contract is socially efficient and best serves the interest of both the*

*seller and broker. If sellers have the same waiting costs, then a standard listing contract is socially efficient.*

Proof: The broker chooses to maximize expected income ( $E[I]$ ) given the seller's choice of contract duration. This is represented as:

$$\max_{t_M} E[I] = \int_0^T F^{\eta_0} G^\mu [sP(1 - F^{\eta_0} G^m) - M\delta^{t_M}] \delta^t dt - N. \quad (15)$$

Assuming Equation (10) holds and the listing contract is of unlimited duration, the broker's choice of the timing of mass promotion ( $t_M^B$ ) is given by:

$$t_M^B = t_M : \frac{\partial E[I]}{\partial t_M} = 0. \quad (16)$$

If the duration of the listing contract is long enough, Equations (13) and (16) show that the broker would choose to start mass promotion after the socially efficient time  $t_M^*$  since  $sP < P - R$ .

The shortest duration of a listing contract that just allows the broker to recover the cost of mass promotion is given by:

$$T : sP \int_{t_M}^T f^{\eta_0} G^\mu (1 - F^{\eta_0} G^m) \delta^t dt = M. \quad (17)$$

Under the conditions of Equation (17), the seller can force the broker to start mass promotion at  $t_M = 0$ . The key for the seller is to choose a listing contract duration ( $T^*$ ) greater than the shortest duration and less than infinity that yields the same efficient solution as in Equation (13):

$$T^* = T : t_M^B = t_M^*. \quad (18)$$

Since the broker faces the costs of promotion, the seller can choose the duration of the listing contract such that the broker's choice of the timing of promotion from Equation (16) will exactly match the socially efficient outcome of Equation (13). The seller will not choose a shorter duration than the one that matches the efficient outcome because the seller must necessarily be worse off because a higher commission rate is paid to competitive brokers who expect higher

costs of promotion. The seller is better off choosing duration to match the efficient outcome while the broker is no worse off. The final result is that both parties are best off if the broker chooses the timing of promotion and the seller chooses the duration of the listing contract to match the efficient outcome.

By assumption, all sellers have the same waiting cost (discount factor). All sellers choose the same  $T^*$  as specified by Equation (18). A listing contract of fixed duration  $\bar{T} = T^*$  is efficient for these sellers. A standard listing contract will thus specify a standard fixed-percentage commission such that:

$$\bar{s} = \frac{N + M\delta^{\bar{T}}}{P \int_0^{\bar{T}} F^{\eta_0} G^\mu (1 - F^{\eta_0} G^m) \delta^t dt} \quad (19)$$

The fixed duration  $\bar{T}$  and fixed-percentage commission  $\bar{s}$  specify the characteristics of a standard listing contract necessary for an efficient solution to the problem faced by sellers without holding or showing costs.

Interestingly, any listing contract between a seller with no transaction costs and a broker can be efficient only if the broker chooses the time to mass promote. In this case, it is the seller's incentives that are inconsistent with an efficient outcome. A seller with waiting costs can achieve the efficient outcome by choosing the appropriate listing contract duration. If sellers have the same waiting costs then standard listing contracts are efficient if the broker chooses the timing of promotion.

The first type of standard sellers who face no significant holding or showing costs appears to be most common in the real estate market. Thus, the findings may partially explain why the preponderance of standard listing contracts allow brokers to choose when advertising and promotional activities will take place during customary time-spans of listing contracts.

### The Model with Seller Holding Costs

Having established that standard listing contracts work well for standard sellers, this section examines whether standard listing contracts serve the best interests of "non-standard" sellers who face either holding or showing costs.

Letting  $E[U(\chi)]$  represent the expected utility of a seller who incurs a cost for holding the real estate pending a potential sale, the socially efficient solution of Equation (12) reduces to the seller/broker choosing the optimal time to start mass promotion ( $t_M^*(\chi)$ ) as:

$$t_M^*(\chi) = t_M : \frac{\partial E[U(\chi)]}{\partial t_M} = 0. \quad (20)$$

The intuition would be that an anxious seller would prefer promotion that stimulates as much buyer interest in the real estate as possible. On the other hand, a broker would prefer to delay mass promotion until some of the readily available target-market buyers have considered purchasing the real estate. In the case of an anxious seller, the broker pays the direct costs of promotion while the seller pays indirect costs if a delay in promotional activities forces him into costly holding of the real estate. Similar to the case of a standard seller, an anxious seller can choose the duration of the listing contract to induce the broker to internalize the full benefit of promotion and the indirect holding costs faced by the seller. However, this choice will also increase the expected costs of promotion to the broker. Brokers will not be willing to accept standard listing contracts because the higher expected costs of promotion will necessarily lead to expected losses. The seller must employ a second instrument, namely an increase in the broker commission, in order to achieve an efficient solution. Thus:

*Proposition 3: A standard listing contract alone does not best serve the interests of a seller who faces holding costs. However, a standard listing contract supplemented by additional incentives to the broker can be socially efficient and best serve the interest of both the seller and broker. The seller chooses the listing contract duration that maximizes shareable surplus and then pays the broker an additional amount that just covers the expected additional cost of mass promotion.*

**Proof:** If the duration of the listing contract is long enough, Equations (16) and (20) show that the broker would choose to start mass promotion after the efficient time since  $sP < P - R$  and the broker does not face holding costs as the seller does. As in Proposition 2, a seller who faces holding costs can choose the duration of the listing contract ( $T_\chi^*$ ) such that the broker's choice of the timing of promotion from Equation (16) will exactly match the efficient outcome of Equation (20).

In this case, however, the duration  $T_\chi^*$  forces the broker to start mass promotion at time  $t_M^*(\chi)$ , which is earlier than what would result from the duration of a standard listing contract. This increases the broker's expected cost. Thus, a competitive broker cannot accept the fixed-percentage commission rate associated with a standard listing contract ( $\bar{s}$ ) because there will be losses. The efficient outcome is achievable only if the seller offers the broker additional compensation

or incentives beyond a standard listing contract. The seller must satisfy the broker's income constraint of Equation (8). Given competitive brokers, this constraint will be satisfied as an equality. The commission rate ( $s^*$ ) consistent with the listing contract duration that best serves the interests of a seller who faces holding costs is given by:

$$s^* = \frac{N + M\delta^{\bar{s}M(\lambda)}}{P \int_0^{T^*} F^{n_0} G^\mu (1 - F^{n_0} G^m) \delta^t dt} \quad (21)$$

The standard listing contract specified the fixed-percentage commission rate given by Equation (19). Thus, the seller who faces holding costs is better off choosing contract duration  $T^*$  and paying the broker an additional amount equal to  $(s^* - \bar{s})P$ . The increase in the commission rate from  $\bar{s}$  to  $s^*$  increases the broker's income just enough to cover the increase in the expected cost of mass promotion. As  $s^*$  maximizes shareable surplus, the standard listing contract supplemented by additional incentives achieves efficiency.

Proposition 3 shows that an anxious seller must either offer a higher commission rate than the standard listing contract or must devise some additional compensation scheme to encourage the broker to start mass promotion at the efficient time. This finding may partially explain a recommendation on realtor.com that states, "If you haven't had much traffic through your house and you're in a hurry to sell, you may want to add the offer of a bonus to the selling broker, in addition to their commission. An example of the wording for such an offer may be 'to the broker who brings a successful offer before Christmas.'"

### The Model with Seller Showing Costs

Letting  $E[U(c)]$  represent the expected utility of a seller who incurs a cost for showing the real estate to prospective buyers, the socially efficient solution of Equation (12) reduces to the seller/broker choosing the optimal time to start mass promotion as:

$$t_M^* = t_M : \frac{\partial E[U(c)]}{\partial t_M} = 0. \quad (22)$$

*Proposition 4: If the seller's showing costs are small relative to his waiting costs then a standard listing contract is socially efficient and*



*best serves the interests of both the seller and broker. If the seller's showing costs are relatively large then a standard listing contract does not best serve the interests of the seller. This type of seller should offer a smaller fixed-percentage commission rate than that of a standard listing contract.*

**Proof:** Equations (16) and (22) show that the broker will choose to start mass promotion before the efficient time since the broker does not face showing costs as the seller does.

If  $c$  is small relative to the effect of discounting and  $t_M^S < t_M^B$  as in Proposition 2, then the seller can force the broker to choose to start mass promotion at the optimal time by choosing an appropriate listing contract duration as in Equation (18). The seller can choose the duration of the listing contract such that the broker's choice of the timing of promotion from Equation (16) will exactly match the efficient outcome of Equation (22).

If  $c$  is relatively large and  $t_M^S \geq t_M^B$ , then the broker will choose to start mass promotion before that desired by the seller. A seller's choice of listing contract duration cannot address this problem. Equation (16) suggests that this type of seller should offer a lower fixed-percentage commission rate than that consistent with a standard listing contract as an incentive for the broker to delay mass promotion. The seller could specify the time to start mass promotion in the listing contract, but it would still be in the seller's best interest to offer the lower commission rate associated with the later start time for mass promotion. Thus, a seller with significant showing costs will always offer the broker a smaller fixed-percentage commission rate than that of a standard listing contract.

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## Conclusion

Our paper makes three important contributions to the real estate literature. First, it differentiates between push and pull strategies in selling a property, developing promotion as a tool for a pull strategy and describing the unique characteristics for promotion in the real estate industry. Second, it describes three segments of sellers for a real estate transaction: patient sellers with significant showing costs, anxious sellers with significant holding costs and sellers with neither significant showing nor holding costs. Finally, it demonstrates the implications for the duration and fee structure of the listing contract based on seller segment and desired promotional timing.

The standard listing contract where the broker chooses the timing of promotion is efficient only if the seller has neither significant holding costs nor showing costs. In this case, the broker makes the efficient tradeoff between the benefits and costs of promotion. However, neither anxious sellers nor sellers with costs of showing the property are served well by standard listing contracts, and it may be

necessary for the seller and broker to negotiate the special terms of promotion prior to signing a listing contract.

There are significant opportunities for future research in promotion for the real estate industry. A key issue is how promotion interacts with other elements in the marketing plan. Promotion may impact the perception of the asking price by the buyer and therefore affect subsequent negotiations by signaling that push efforts have been unsuccessful. This seeming lack of success may be attributed to an anxious seller, an inflated selling price or a weakness in demand for that type of property. All of these factors would lead a buyer to lower the offer price. Thus, promotion may help sell the house more quickly, but the final price may be lower than optimum due to a perceived signal by the buyer that the seller is vulnerable in price negotiations. Alternatively, a lower price may result from bringing in marginal buyers who may be more price sensitive. These potential interactions impact the timing of promotion in a real estate transaction.

Further research is also needed about the more effective types of promotion. Certain promotions, such as advertising in local papers, may be more likely to bring in target-market buyers than broader promotions such as promoting through a television listing. Also, in-home promotions such as detailed information sheets that the buyers can take with them may act to extend the life of the promotion with the buyer pool attracted.

Finally, the types of sellers used in the model have not been considered in research on broker effort. Expansion of existing models to consider the implications of the types of sellers on broker effort and contracts provides a potential area for future research.

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