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# Do Real Estate Contingency Clauses Affect Selling Price and Time-on-the-Market?

## Abstract

Real estate contracts often contain a wide variety of contingency clauses. These third-party approvals are often outside the seller's control and can lengthen the-time-on-the-market (TOM) and reduce the surety of close. To compensate for these undesirable attributes, buyers typically offer higher purchase prices. This study examines the factors affecting contract contingencies and the effect of contract contingencies on TOM and selling price. Using transactions from Miami-Dade County in south Florida, we find that the presence of contingency clauses is significantly related to market conditions, TOM, list price premiums, distressed transactions, brokerage characteristics, home occupancy status, size, and age. Contingency clauses have differential effects on price premia that range from -3.7% to +2.2%. However, when considering TOM, contingency clauses have significant price premia ranging from -3.3% to +2.4%.

JEL-Codes: R300, R310, L850.

Keywords: contingency clauses, price premia, real estate contracts, time-on-the-market, selling price.

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## 1) Introduction

Contingency clauses are present in every residential real estate contract, between the listing agent and the seller, and if there is an offer on a property, between the seller and the interested buyer. In the listing contract, the buyer's agent has contingency provisions stating the commission owed to the listing and selling agents, the duration of the listing contract, and special provisions such as monies owed to agents should a seller find a buyer without agent help. Many studies have examined commission incentives and contract duration and their effect on agent effort, selling price, and time-on-the-market (TOM).[1] The second type of residential real estate contract is the purchase contract, which is the agreement between the seller and buyer and establishes the selling price, time of sale, and other conditions necessary to consummate the sale. Local and state Realtor® associations approve most residential real estate purchase (or "sale") contracts. These contracts have easily selected options to make the contract contingent upon a home inspection, financing, and a clear wood infestation report. Buyers and sellers can modify the standard contract to accommodate their individual circumstances.[2] Sellers who accept contingencies that increase the uncertainty of a sale or time to closing want to be compensated through higher prices or by allowing the seller to continue searching for better offers. Buyers submitting offers with such contingencies are often likely to be rejected, but buyers can increase the likelihood of acceptance by offering higher prices.[3] The current study focuses on specific contingency clauses in purchase contracts.

[1] See Benjamin, Jud, and Sirmans (2000) and Micelli, Pancak, and Sirmans (2000) for a review of the research in the brokerage literature and how the agent-seller relationship can be improved.

[2] Sellers of foreclosed properties, for example, often favor contracts with no contingencies, which expedites property closings. They are frequently willing to discount the selling price to achieve a quick sale. Likewise, sellers of properties with high market demand are less likely to accept contingencies that may delay a property's closing or make it less likely to close.

[3] For example, a buyer who needs to sell an existing home prior to closing on a new home may pay a premium for a home in high demand or, alternatively, may purchase a home from a seller with few good offers.

There are many different types of contingencies, but the risk-reward tradeoff applies in every situation. A buyer desiring contingencies that lower their risk must be willing to pay a higher price to compensate the seller for the risk transfer to their side of the transaction. Previous research on contingency clauses finds strong evidence of a risk-reward tradeoff between buyers and sellers based on contingency clauses. For example, by Allen, Shilling, and Sirmans (1986) find that sellers receive substantial price premiums for "difficult" sales where there is a reduced probability of closing, a longer potential TOM, or when they have to make financing or selling concessions. Similarly, Shilling et al. (1992) find that sellers require a higher selling price some contingency clauses that benefit the buyer at the seller's expense. Also, all-cash financing clauses that increase the surety of closing a sale reduce the selling price (Asabere, Huffman, and Mehdian, 1992; Lusht and Hansz, 1994; Forgey et al., 1994; Clauretie and Danashvary, 2007). A buyer may ask for a selling price concession (SPC), where the seller pays some of the financing or closing costs normally paid by the buyer. The question is whether seller-paid concessions are fully capitalized into the selling price. Studies by Asabere and Huffman (AH) (1997), Johnson et al. (2000), and Winkler and Gordon (2015) suggest that full capitalization can depend on the type of SPC (discount points, closing costs, etc.), the type of loan (conventional versus FHA), and type of sale (REO versus non-foreclosure).

Numerous studies have examined property price and TOM effects of financing and SPC clauses, however, studies of other common contingencies clauses are scarce. Shilling et al. (1992) is most similar to the our study, however, their study has a considerably smaller sample and examine only three types of contingency clauses. Also, the price regressions include directly include time-on-the-market as an explanatory variable instead of using an instrumental variables approach to control for a potential endogeneity problem.The current study examines six common contingency clauses sought by buyers: (a) required third-party approval to complete the sale, (b) a backup contract from another interested buyer should the inititial buyer's purchase contract fail, (c) a pending inspection of the seller's property, (d) a sale of the buyer's property, (e) the closing of the sale of a buyer's property, a lease option on the sell'er

property.[4] These represent all contingency clause types coded for the contingency clause variable in the empirical data set.[5]

Our findings suggest that contingency clauses are related to TOM. Pending property inspection and backup purchase contingency clause properties shorten TOM, while a sale of the buyer's property lengthens TOM. Also, contingency clauses affect property prices. When holding constant time-on-the-market, third-party approvals result in a 3.3% price discount, presumably due to the uncertainty of gaining third-party approval for the sale. Backup contracts sell for a 2.2% premium; these properties have more than one interested party, which likely explains the premium paid by the buyer. Sellers accepting a sale of a buyer's property contingency clause receive an average price discount of 2.1%.

## 2) Literature Review

The literature on contingency clauses in residential real estate purchase contracts has been confined primarily to financing and seller-paid concessions. However, the effects of contingency clauses are related to a broader literature on seller motivation, time-on-the-market, and likelihood of sale. For example, motivated sellers indicate their intentions through pricing and contract clauses, such as paying costs typically paid by the buyer (e.g., financing and closing costs). Similarly, sellers may accept contractual provisions that potentially lengthen TOM by waiting for the sale or close of a buyer's property, which may also affect the probability of sale.

An early study by Allen, Shilling, and Sirmans (1986) examined the price effect of multiple contingencies, which they labeled "difficult" contracts. They find that these "difficult" contracts include

[4] A sale of other property contingency clause is removed when the property is "accepted" or when all parties have signed the purchase contract. A close of other property clause requires not only that the property be sold, but also that the closing has occurred, property ownership is transferred, and the funds are paid to the seller.
[5] Other contingency clauses that are not coded as a type of contingency may be written into individual purchase contracts, however, they are not available in the MLS data set.

sellers having (a) to wait for the sale of a buyer's house, (b) a short time to accept the buyer's offer, (c) financing partially paid by them, or (d) strict conditions on the buyer's financing costs, led to an 11% price premium. Shilling et al. (1992) examine three purchase-contracting (contingency) variables in a hedonic pricing model: (a) the seller pays closing costs, discount points, and /or makes repairs for the buyer, (b) the buyer must sell an existing residence (subject to resale contingency clause), (c) the seller has one day or less to decide wither to accept the buyer's offer. The study reports that sellers receive a premium for the resale contingency clause and the short time frame for the seller to decide whether to accept the buyer's offer. However, the payment of seller-paid expenses variable is unexpectedly not statistically significant.

Most studies that have examined purchase contract contingency clauses have focused on cash offers and selling price concessions. Asabere and Huffman (1993) investigate whether sellers receive a premium when having to wait for a sale. They find that the seller receives a premium of 0.08% per day beyond an average 60-day settlement period. Financing contingency clauses are standard and include all-cash offers from the buyer and seller-paid clauses where the discount points, closing costs, and prepaid expenses are usually paid by the buyer instead of the property seller. Asabere, Huffman, and Mehdian (1992) conclude that all-cash house transactions are associated with a 13% discount relative to transactions involving financing terms. The all-cash offer removes all financing contingencies and, in essence, the cash price represents the sellers "certainty-equivalent price." Lusht and Hansz (1994) and Forgey et al. (1994) report a similar discount of 16% for cash sales with a different sample of row homes, and they find that the discount is not affected by other extraneous influences such as owner-occupancy, 18-month resale, days to close, and days on the market. Clauretie and Danashvary (2007) report a smaller cash discount of about 2% after correcting for spatial price interdependence and TOM endogeneity, while Winkler and Gordon (2015) show a cash discount of 6.4%. Asabere and Huffman (1997) examine the impact of home sellers who pay closing costs or the discount points of a home buyer's loan and conclude that closing cost

concessions do not produce capitalization effects, although the price effects are less certain. The authors further conclude that discount point concessions on conventional loans are capitalized into house prices. However, the premiums disappear for FHA and VA loans.[6]

Johnson et al. (2000) noted that sellers are concerned about the sales price net of total seller-paid concessions (SPCs). However, when discount points and closing costs are combined, they find that total SPCs are fully capitalized into the selling price. Winkler and Gordon (2015) also report that SPCs are fully capitalized into the selling prices of foreclosed properties but also report a 6.7% to 15.0% price premium for foreclosed property prices, with a 19.5% longer time on the market. They also find that buyers of foreclosed properties with SPCs receive an extra cash discount of 11.4% above the typical cash discount of 6.4%.

Several studies have investigated factors that affect the probability of sale related to contract clauses. Shilling, Benjamin, and Sirmans (1990) support the importance of seller motivation. The authors found that foreclosed property sellers almost always seek to sell quickly and make their decisions based on the net proceeds of the transaction after all costs are considered. Springer (1996) finds evidence that more motivated sellers, including sellers of foreclosure properties, tend to sell at lower prices. Because of the seller's willingness to sell at a lower price, the TOM is also lower for foreclosed properties. In general, more motivated sellers sell their homes more quickly and at lower prices. Glower, Haurin, and Hendershot (1998) find that the listing price is not significantly different for motivated sellers, but the price at which they are actually willing to sell the property is frequently lower, resulting in lower selling prices and shorter TOM. Johnson, Benefield, and Wiley (2007) investigate the factors that affect the probability of a property transaction successfully closing and report that marketing time (time-on-the-market), seller motivation, quality indicators, and new properties increase the likelihood of a sale. Although the study did not

[6] Clauretie (1999) finds some errors in the calculations and assumptions in the Asabere and Huffman (1997) study, but after addressing his concerns, the authors report that their initial findings remain largely unchanged.

examine any contractual clauses, it did note the higher cost for sellers in financial distress and those needing to purchase another property with the proceeds of the sale. These circumstances are associated with contingency clauses in purchase contracts.

### 3) Contingency Clauses and Housing Prices

Contingency clauses require sellers and buyers to adhere to specific provisions for a real estate property transaction. Shilling et al. (1992) develop that shows that variations in contract terms can affect the home price through a buye'sr utility function. By introducing more protective clauses into the sales contract that protect the buyer, it lowers the number of default states in which the buyer forfeits the deposit.[7]

Fundamentally, contingency clauses can affect a property's net selling price, probability of closing, and time to closing; all of these are relevant to examining the opportunity loss to the seller. Also, these clauses can affect the "under contract" for sellers when they are unable to sell the property to another prospective buyer during the time the first purchase contract is in effect. Therefore, contract value added ($CVA$) is defined as the agreed-upon net price received by the seller relative to the seller's reservation price ($R$) as stipulated in the purchase contract less the potential loss of the property's sale to another seller because the property is already under contract.

Suppose a seller engages in a purchase contract with a buyer to sell a property at price net sales price $S_1^n$; the contract stipulates a home closing at time $T_1$.[8] The probability of completing the sale and closing on the property is $p_1$.[9] Assuming that the seller has no prospects to receive a scueesful bid on the seller's

[7] However, in some states, the protection offered by the escrow deposit is limited because state laws make it relatively easy to back out of a purchase agreement without losing the escrow deposit. Also, some states do not permit the seller to continue to market a property while the property remains under contract, requiring the seller to take the buyer to court, largely defeating the purpose of an escrow deposit.

[8] $T_1$and $T_2$are expressed as a fraction of a year.

[9] In this case, $0 < p_1 < 1$, $s_1^n - \bar{R} \geq 0$, and $T_1 > 0$, and $r > 0$.

property during the period the property is under contract from the first successful bidder, the contract added value is:

$$CVA = [p_1(s_1^n - \bar{R})e^{-rT_1}] \quad (1)$$

Equation (1) represents the present value of the expected net selling price above the seller's reservation price. When a contingency clause potentially precludes the sale to another party at net selling price $S_2^n$at time $T_2$ assuming probability $p_2$, the $CVA$ is:

$$CVA = [p_1(s_1^n - \bar{R})e^{-rT_1}] - [p_f p_2(s_2^n - \bar{R})e^{-rT_2}] \quad (2)$$

where $p_f$is the probability of a foregone bid on the seller's property because the seller accepted the earlier purchase contract with a buyer to sell a property at price net sales price $S_1^n$; the contract stipulates a home closing at time $T_1$. If the later bidder is expected to offer the same bid as the first and with equal probability of closing the sale, so that $s_1^n = s_2^n = s$ and $p_1 = p_2 = p$, Equation (3) simplifies to:[10]

$$CVA = pe^{-rT_1}(s - \bar{R})[1 - p_f e^{-r(T_2 - T_1)}] \quad (3)$$

Because the influence of the present value terms in Equation (3) is usually small, the $CVA$ is principally affected by the probability of losing the opportunity to receive a second purchase contract bid while the property is under contract from the first successful bidder, $p_f$, and the net selling price and reservation price spread.[11] The $CVA$ approach can be applied to different kinds of contingency clauses. A contingency clause lengthening the time to closing increases the probabilility of foregoing another acceptable bid, $p_f$, which lowers the $CVA$. The seller would respond by expecting the buyer to agree to a higher selling price ($s_1^n$). Also, lengthening the time until closing increases $T_1$, decreasing the $CVA$. Again, the seller would need to raise the selling price so to achieve the same $CVA$. Also, implicit in $s_1^n$is

[10] Note that the present value term, $e^{-rT_2}$, can be rewritten as $e^{-r(T_2 - T_1)}$.

[11] Note that if $p_f = 0$, $CVA = pe^{-rT_1}(s - \bar{R})$, and in addition, if we assume that $T_1 = T_2 = 0$, $CVA = 0$.

the reduction in the selling price because of expenses. Any additional costs associated with a buyer contingency clause would need to be offset by a higher gross selling price.

Third-Party Approval

A purchase contract requiring third-party approval occurs when a seller is unable to accept an offer without another party's approval. For example, the sale of a property in a trust sometimes requires the approval of the trustee.[12] A more common reason for a third-party authorization occurs when the proceeds from the sale of the property are inadequate to repay the property's loan balance, and in that case, the lender must approve the contract. These "short sale" transactions are usually made at a price discount relative to non-distressed sales.[13] Also, short sales require more documentation than usual. Short sales typically take a long time to close, increasing the probability of foregoing another acceptable bid, $p_f$, and lengthening the time until close, $T_1$, decreasing the $CVA$. However, because the seller is unable to respond to a lower $CVA$ and the bank accepts loss to avoid a worse economic scenario of foreclosure. Therefore, the home is sold at a discount.

The likelihood of a third-party approval should be higher when the market for selling houses is weak and the housing inventory is high and, therefore, when the average TOM is longer. Also, a third-party approval should be more likely to occur when a seller has an urgency to sell, such as when a property has been on the market for a long time or when a house is occupied, and a seller is unable to move until the property is sold. As a result, the seller suffers financial hardship, and there is more uncertainty for the

[12] If a property has a deed listing multiple parties, the purchase contract typically requires approval by the other owners.

[13] Banks will often allow short sales when the property is likely otherwise to be in foreclosure, where the lender usually receives less than from a short sale. Short sales can take longer to close because a broker price option (BPO) is ordered, and the broker provides the bank with the estimate of the home value. Another negotiator might be assigned, and all the information is reviewed. The bank may counteroffer which can delay closing further. Short sales approval time ranges from a couple of weeks to several months.

buyer, who has no guarantee that the transaction will close. Third-party approval is less likely to occur for foreclosure (REO) properties because the owner is usually a bank or asset management company. Agents who work with third-party approval properties may require higher commissions to compensate for the additional time and documentation needed to sell these properties.[14]

Pending Inspection

Buyers usually expect a home inspection prior to closing on a property, with the closing of the property sometimes contingent on the outcome of the inspection. Buyers and sellers often negotiate regarding what needs to be fixed and who will pay for the improvements. This clause causes buyers to have more confidence that they are purchasing a property without major defects and thus, should be willing to offer a higher price. Sellers who agree to pending inspection clauses may be aware that their properties have few defects or have already been remedied. Sellers who are unwilling to accept inspection contingencies should expect to receive lower offers.[15] The expectation is that properties with pending inspection clauses should close more quickly, reducing $T_1$, an increasing the probability of a successful sale, $p_1$. Also, the expected shorter time to closing should reduce $p_f$, the probability of a foregone sale to another potential buyer while the property is under contract with the first successful bidder. Nonetheless, the seller is likely aware of the exceptional condition of the property likely has a higher reservation price, $\bar{R}$, and therefore, the selling price ($s_1^n$) may not be affected.

Pending inspection contingency clause properties may have defining, observable characteristics. These properties should have fewer defects and, therefore, a shorter TOM, and they may also have a price premium. A short seller wants to sell the property quickly and has limited money and time to repair

[14] The seller does not benefit from the sale price being higher and may not be as motivated during negotiations. The exception to this would be those sellers that realize that they may ultimately pay taxes on any forgiven debt amounts.

[15] Sellers of home foreclosures (REOs) are often willing to trade off lower sales prices for more certain and faster sales, and they frequently do not accept pending inspection clauses in purchase contracts.

deficiencies. Therefore, pending inspections should be less likely to occur for short sale properties where the seller has often reduced the price below market. A pending inspection may be less common when agents handle both sides of the transaction as there may be an element of trust that is not present with separate agents. More productive and experienced agents may be drawn to pending inspection clause transactions because of a quicker time to closing and fewer problems. A large housing supply market is often associated with a long TOM and should increase the chance of a pending inspection.

Sale of Other Property

A contingency clause that requires the sale of another property likely lengthens the time until closing. During this time, the property cannot be sold to another potential buyer. Therefore, the probability of foregoing another acceptable bid ($p_f$) increases and the time until close, ($T_1$) is lengthened, both of these decrease the $CVA$. Also, because of the uncertainty associated with the selling of another property, the probability of a successful closing, $p_1$, should be lower. Therefore, sellers entering into a purchase agreement with this clause would probably increase their contracted selling price ($s_1^n$). Because of the unique circumstances when a seller would be willing to accept this clause, it is more likely that the selling and listing agent are the same. Also, more productive agents may avoid these clauses because of the greater likelihood of lost time and not closing the deal.

Close of Another Property

Although sometimes used interchangeably, the closing on another property, usually the buyer's personal residencie, is different than the sale of another property. A close of other property clause requires not only that the property be sold, but also that property ownership is transferred to the buyer in exchange for funds paid to the seller.The closing of a buyer's property contingency clause is likely to take longer and may be riskier for the seller if the buyer does not already have a party that has signed a

contract. However, it is likely that the buyer already has a signed purchase contract and is waiting for the closing. Therefore, the seller's risk (probability of sale) and time to closing should be shorter compared to the sale of buyer's property clause. Nonetheless, uncertainty increases for the seller's property with the precondition that closings occur on the buyer's property, and the time to close should lengthen as well. Therefore, the probability of foregoing another acceptable bid ($p_f$) increases and the time until close, ($T_1$) is lengthened compared to a transaction without this contingency clause. In addition, probability of a successful closing, $p_1$, is lower because of the uncertainty of closing on the buyer's house. Therefore, the $CVA$ decreases unless the increasse the contracted selling price ($s_1^n$). Therefore, the expectation is a higher contracted selling price and a longer TOM.

Backup Contract

A backup contract may signal a particularly desirable ("hot") property that has less time on the market (and until closing), decreasing $T_1$ and increasing $CVA$. Also, the first purchase contract holder does not want to lose the property to a backup buyer, and the probability of completing the sale ($p_1$) increases. Because the second successful bidder is already known and a backup purchase contract exists, $p_f$=1. However, $s_2^n$is not known, only $s_2^n - \bar{R} > 0$. However, the backup contract and strong interest in the property should result in an increase in $s_1^n$. Backup contract properties are less likely to be a short sale or foreclosure. Also, sellers who have more desirable properties may choose agents who provide more personalized service even though the commission may be higher. Owners of these properties likely receive more potential offers, and therefore, it is less likely that the listing and selling agent will be the same. More productive listing agents often list more houses by suggesting lower selling prices, and this strategy is not necessary for more desirable properties.

Lease Clause

A lease clause is leasing of the property to the buyer, with an option for the buyer to purchase the property anytime during the lease at the terms specified in the purchase contract. If the buyer does not purchase the property, the lease terminates early without penalty. However, the buyer typically has an option money deposit (OMD) held in escrow, which is applied to reduce the selling price if the buyer decides to purchase the property, but which is forfeited if the buyer chooses not to purchase the property during the lease term.[16]

The expected net selling price is complex for leases clauses; it is affected by negotiated OMD and rental payments. The time to closing on the purchase contract with the lease contingency clause should be longer than a non-contingency purchase contract closing, and if it falls through, the time to closing is extended to find a suitable buyer. Therefore, the the time until close, ($T_1$) is lengthened, and the probability of foregoing another acceptable bid ($p_f$) increases. In addition, probability of a successful closing, $p_1$, is much lower because the contract give the buyer the option to purchase the property, and the potential buyer may decide not to purchase the property. Nonetheless, the seller may not increase the selling price, $s_1^n$, in an effort to convert the lease to a purchase. Instead, the seller may increase lease payments which helps to encourage the lessee to purchase the property.

## 4) Methodology

We examine the effects of contingent contracts on selling prices using a hedonic pricing model approach. Rosen (1974) develops a model of product differentiation based on implicit prices of house attributes revealed to potential buyers from observed houses with differentiated characteristics.[17]

[16] In addition, the contract may or may not permit the seller to show the property to other interested buyers, and the seller can accept backup offers until the buyer decides to purchase the property.

[17] Rosen's work has its foundation from the theory of consumer behavior by Houthakker (1952), Becker (1965), Lancaster (1966), and Muth (1966).

Shilling et al. (1992) suggest that the appropriate characteristics to be included in a hedonic price function model should be extended to include characteristics of a repurchase contract agreement rather than just characteristics which pertain to consumption of the good itself. Therefore, their empirical models include dummy variables to capture the effect of the contingency clauses. The regression model used in this study uses a similar approach as follows::

$$\ln(SP_i) = \boldsymbol{\beta}\mathbf{X}_i + \boldsymbol{\phi}\mathbf{CT} + \varepsilon_i \quad (5)$$

where $\ln(SP_i)$ is the natural logarithm of the selling price for property *i*, $\mathbf{CT}$ is a matrix of contingency contract variables, and $\mathbf{X}_i$is a matrix of variables representing property characteristics, occupancy status, cash financing, type of sale (short sale, foreclosure, and non-foreclosure), and fixed effects representing the location's zip code, and month and year of sale. The property and brokerage characteristics are as previously defined. Matrix $\boldsymbol{\phi}$ is the vector of contingency contracts coefficients of variables in matrix $\mathbf{CT}$, and $\boldsymbol{\beta}$ is a set of parameter estimates for the variables in matrix $\mathbf{X}$. The disturbance term is $\varepsilon_i$.

The determinants of the contingency clauses are examined using a probit model. Using an index function approach, the outcome of a discrete choice, whether to have a contingency clause, reflects an underlying regression (Greene, 1997). The seller and purchaser make a marginal benefit - marginal cost calculation. The marginal benefit and marginal cost are not directly observable, but the difference between the marginal benefit and cost is defined as an unobservable response variable $z_i^*$ defined by a regression relationship $z_i^* = f(\gamma' H_i) + \mu_i$, where the error term is independently normally distributed with a mean of 0 and a variance of 1. If the purchase contract excludes a particular contingency clause, the dummy variable is $z_i = 0$ and $z_i^* \leq 0$. If the purchase includes a particular contingency clause, is $z_i = 1$ and $z_i^* > 0$ $\beta' x_i$ is E($z_i^*$ |$x_i$) instead of E($z_i$ |$x_i$) as in the linear probability model. The operational probit model estimates the likelihood of categorization as a specific contingency clause transaction, or a non-contingency transaction as follows:

$$z_i = \boldsymbol{\gamma}' \mathbf{H}_i + \mu_i \quad (6)$$

The coefficient vector is $\boldsymbol{\gamma}'$; the explanatory variable matrix is $\mathbf{H}_i$with variables explaining the presence of a specific clause such as market-level supply-demand housing conditions, the urgency of sellers to close on their property, house size and age, and brokerage characteristics. The average monthly days-on-the-market captures housing market conditions, and the urgency of sellers to close on their properties is captured by days on the market of the specific property, the list price premium, occupancy, and whether the property is a distress sale such as foreclosure or short sale. Brokerage characteristics include transaction broker commission, whether the selling agent is the listing agent, and the number of listing agent's properties that the agent or other agents sell.

When a property takes longer to sell, the seller incurs more holding costs. Sellers should willing to incur these costs only when a longer TOM is compensated through a higher selling price. Many studies have examined the determinants of TOM which includes select property characteristics, occupancy, brokerage, degree of overpricing, cash financing, distressed sales, and location and time.[18]

The research question of whether contingency clauses shorten TOM is empirically investigated by modeling TOM using three parametric accelerated time failure models (AFT), the lognormal AFT, Weibull,

[18] Yavas and Yang (1995) suggest that housing markets are relatively efficient and that while differences in amenities do affect selling prices, they do not affect TOM. Similarly, Daneshvary and Clauretie (2013) also show that amenities do not appear to significantly affect TOM. However, house size and TOM are positively related, indicating that larger homes take longer to sell. This relation could exist because larger properties have more unique features (more heterogeneous) or because there are fewer buyers due to lesser affordability. Market condition measures such as time of year and the supply of housing also influence time-on-the-market (Yavas and Yang, 1995; Anglin, Rutherford, and Springer, 2003). Studies also suggest that house vacancy (or, conversely, occupancy) influences time-on-the-market (Daneshvary and Clauretie, 2013). Yavas and Yang (1995) further find that market conditions and brokerage variables are significant in the TOM model but do not influence the selling price. Brokerage effects on TOM include broker effort (Sirmans, Turnbull, and Benjamin, 1991) and the agent's skill and expertise (Yang and Yavas, 1995; Jud, Seaks, and Winkler, 1996). More recently, Daneshvary, Clauretie, and Kader (2011) employ agent skill and expertise measures in their pricing model. These measures include brokerage commission rates, a property listed and sold by the same agent, and the number of listings relative to the average. Yavas and Yang (1995) and Anglin, Rutherford, and Springer (2003) find that seasonality, housing supply listed on the market, and measures of market conditions, affect time-on-the-market. Anglin, Rutherford, and Springer (2003) and Allen, Rutherford, and Thomson (2009) similarly find that increased overpricing leads to a longer TOM.

and Generalized Gamma. The Generalized Gamma model is the most flexible. Manning, Basu, and Mullahy (2005) use the generalized Gamma distribution, describing alternative weighting approaches for the generalized linear model. The generalized Gamma probability density function has parameters $\kappa$, μ, and σ: $f(y;\kappa,\mu,\sigma)=\frac{\gamma^{\gamma}}{\sigma\sqrt{\gamma\Gamma(\gamma)}}\exp[z\sqrt{\gamma}-u] \quad y\geq 0$ where $\gamma=|\kappa|^{-2}$, $z=\text{sign}(\kappa)\{\ln(y)-\mu\}/\sigma$, and $u=\gamma\exp(|\kappa|z)$. This equation can be interpreted as a standard normal ($z$) scale distribution of the logarithmic-transformed $y$ variable as $\mathrm{d}z=\left(\frac{1}{\sigma y}\right)\mathrm{d}y$. Replacing the parameter $\mu$ by $x'\beta=\beta_0+\beta_1 x_1$, where $x$ is the covariate matrix that includes the intercept, the $\beta$ coefficients are estimated. The generalized Gamma model is stated as a linear accelerated failure-time (AFT) model with $TOM_i$ denoting the survival time:

$$\ln(TOM_i)=\boldsymbol{\beta}\mathbf{K}_i+\boldsymbol{\phi}\mathbf{CT}+z_i \tag{7}$$

The vector of regression coefficients is $\boldsymbol{\beta}$, and $\mathbf{K}_i$is the matrix of explanatory covariates. The matrix of regression coefficients is $\boldsymbol{\phi}$, and $\mathbf{CT}$ is the accompanying regression matrix of contingency clause structural variables; $z_i$ is the disturbance term. Matrix $\mathbf{K}$ has variables capturing the effects of property characteristics, occupancy, brokerage characteristics, degree of overpricing, cash financing, type of sale (short sale, foreclosure, and non-foreclosure), and fixed effects representing the address zip code, and month and year of sale.[19] The AFT model coefficients are interpreted similarly to the least-squares semi-logarithmic model. Property characteristics include house square feet, house age, and lot size as continuous variables, and structural variables representing new construction, type of view (water, garden, golf course, pool, and other view), tile roof, spa, inground pool, carport, and garage. Brokerage characteristics consist of the transaction broker commission (%), the number of listing agent's properties sold, and whether the listing agent sells the property too.

[19] Time on the market is calculated using Corelogic days on the market for listed properties from the original list date to the close date.

The distribution of the disturbance term determines the appropriate regression model. The gamma distribution is the most flexible of the parametric duration models, and kappa (κ) and sigma (σ) statistical tests indicate the appropriateness of specific parametric duration models. The model log-likelihood, Akaike Information Criteria (AIC), and the Bayesian Information Criterion (BIC) are measures for selecting the preferred model.[20]

Higher prices may occur when sellers are willing to wait longer for a sale. Also, some contingencies such as backup contracts may entice buyers to close more quickly, while other contingencies, such as contracts contingent on a sale or closing of a buyer's property, may lengthen TOM. A regression specification that includes TOM as an independent control holds constant these effects. However, ordinary least squares regression requires that explanatory variables are independent of the regression's error term; this condition is not met with TOM as an explanatory variable, as it is endogenous. Instrumental variables estimation can address the endogeneity problem by introducing one or more variables to explain TOM which are uncorrelated with the regression error term. The instrument for TOM is the number of listings sold per year by the listing agent. The historical record of the number of a listing agent's properties sold indicates market strategy success and the listing agent's methods that will likely be employed to sell the seller's property. Sellers wanting a quicker sale, even at a lower price, would choose agents with a history of having more of their listings sold. These listing agents may more often sell their clients' properties consistent with the sellers' desire for a shorter TOM. The instrument also captures general housing market conditions. Empirical tests are conducted to test the instrument's efficacy.

[20] The Weibull AFT model is commonly used in TOM duration models in real estate. The Weibull is appropriate for modeling data with monotone hazard rates that increase or decrease exponentially over time, whereas the exponential distribution assumes a constant hazard. Manning, Basu, and Mullahy (2005) indicate that the lognormal TOM specification might be favored if kappa (κ) = 0 while the Weibull model might be preferred if kappa (κ) = 1. If κ = 1 with the additional constraint that sigma (σ) = 0, the exponential is preferred.

An instrumental variable regression is utilized when time-on-the-market is in the hedonic price regression as follows:

$$\ln(SP_i) = \mathbf{\beta X} + \mathbf{\phi CT} + \psi \ln(\widehat{TOM_i}) + \varepsilon_i \quad (8)$$

The regression coefficient for days-on-the-market is $\psi$, and the other terms are as defined in equation (5). Both the first and second steps are estimated using instrumental variables (IV) to minimize error.[21]

An important question is whether contingency property transactions have latent (or unobservable) characteristics that influence the selling price which would bias the regression coefficient. Therefore, a test for sample selection bias is conducted on the price regression, the second step of the Heckman (1979) sample selection methodology.[22]

## 5) Data

The data for the study is from the Miami-Dade County metropolitan area. According to the Census Bureau, Miami-Dade's population was 2.7 million in 2019. It is the most populated county in Florida and is highly urbanized with 34 incorporated cities. The population has an ethnic base of 76% white, 16% African-American, and 8% of other ethnicities. About 20.2% of persons are under the age of 18 years, while 17% of the population is age 65 or older. Of residents 25 years or older, 30% have achieved a bachelor's degree or higher. However, 13.5% of families live below the poverty line compared to 9.9% in

[21] The two-stage least squares (2SLS) and instrumental variables regression approaches provide the same coefficient estimates assuming that all variables are correctly included in the first-stage regression. However, the 2SLS standard errors are not identical and need adjustment. In the first stage regression, predicted values of time (days) on the market ($\widehat{TOM_i}$), from equation (6), are estimated for use in the second stage least squares price regression, equation (8). Equation (6) is estimated using all of the independent variables in equations (6) and (8). The IV methodology produces an unbiased estimate of the coefficient in the second-stage regression.

[22] Heckman's sample selection bias approach uses a two-step procedure. In the first step, the inverse Mills ratio (IMR) variable from the probit model is estimated and saved. In the second stage, the inverse mills variable is included in the least squares and 2SLS regressions. A sample selection bias exists if the inverse mills ratio (IMR) coefficient is statistically significant; in that case, the IMR coefficient corrects for the sample selection problem. A statistically insignificant suggests that there is insufficient evidence that a sample selection bias problem is present, and therefore, the second stage price (or IV) regression do not require the correction procedure.

the State of Florida. The median household income is $51,347 (in 2019 dollars), and average owner-occupied housing value is $465,988 compared to $337,955 in the State of Florida.

The data for this study is compiled from several local Multiple Listing Services, the county assessor's office, and CoreLogic. Duplicate transactions were eliminated as some properties are listed in more than one Multiple Listing Service. The data set spans 2000 to June 2020; contingency clause information is unavailable until 2015. The data from 2015 to June 2020 consists of 164,726 transactions for all types of housing ownership, with 76,158 of these defined as single-family home transactions. Because the contingency clause field is relatively new, about 22.2% left the field blank, and these are excluded because it is unclear if missing data reflects no contingency clause, or whether the agent did not complete the information in the field. Therefore, missing contingency clause are not included in the final sample. All contingency clauses that are recorded in the contingency are included to assure completeness. After removing the blank contingency field transactions, the observation count is 59,245. Missing data in other required fields results in 15,850 dropped observations and a final data set of 43,395.

## 6) Results

Table 1 shows the descriptive statistics of the sample. The average closing price is about $430,000 with an average size of 1,970 square feet. However, contingency transaction properties are about 12.2% less expensive than non-contingency properties but have only 4.4% less square footage. The list price premium, defined as the percentage that the list price is above the expected selling price, is 2.8% for those with a contingency and 4.2% for no contingency properties. On average, houses are 42 years old for contingency and non-contingency samples, and closings occurred in about 64 days for properties without a contingency versus 57 days with a contingency. Agents completing the contingency information reported no contingencies (47%), pending inspection (30.1%), third-party approval (15.1%), backup contract (4.5%), sale of other property (1.8%), close of other property (0.7%), and lease option (.1%). Also,

while about 28% of non-contingency properties sell for cash, only 17% of contingency properties sold are cash sales. REOs (foreclosures) are more likely to sell without contingencies, and short sales are more likely to have contingencies.

Tables 2 and 3 compare the subsamples of contingencies. Pending inspection houses averaged a TOM of 53 days compared to longer TOMs of other contingency clause subsamples, including sale of other property (69 days), close of other property (67 days), and lease option (65 days). The average selling price for third-party approval properties is the lowest among the contingency contract transactions at $387,755 compared to $459,906 for backup contract properties. Many contingency contract transactions have higher occupancy rates, including backup contract (72.9%), sale of other property (76.3%), close of other property (74.6%), and lease option (74.5%). Other variables that varied considerably include the same listing and selling agent, and the number of agents' listing sold.[23]

The probit model marginal effects are shown in Table 4. As the average market TOM increases, the probability of a third-party approval or pending inspection contingency clause increases, and the probability of a backup or lease option contingency decreases. For third-party approvals, the increase is about 1% for every 10 days of increased time on the market. List premiums are strongly inversely related to third-party approvals because third-party approval properties should be priced attractively. Larger houses increase the chance of a backup contract or sale of other property clause transaction. Suppose the listing agent also sells a property. In that case, the probability that the sale is a pending inspection contingency property decreases by 6.3%, and it decreases by 0.7% for backup contract contingencies, while increasing in probability by 0.5% for the sale of other property. The selection of listing agents is also related to the contingency provision type. As agent productivity increases, the probability of a third-party approval decreases, presumably because more productive agents do not want to list properties requiring

[23] Although the average listing agents' properties sold averages 94, it ranges from 28 (Sale of Other Property) to 118 (Pending Inspections), obscuring the great variability of this variable among the types of contingencies.

third-party approval because of the time commitment to sell these properties. Likewise, more productive agents have less probability of having contingencies for a backup contract, a sale of other property, and a close of other property.

The time-on-the-market duration model findings are reported in Table 5. Three parametric models are shown in the table. Kappa is 0.38, indicating that the generalized Gamma model is preferred to the lognormal AFT and Weibull models based on functional form. The generalized Gamma model has the highest loglikelihood, and the lowest AIC and BIC statistics, indicating that it is the preferred duration model. Holding constant extraneous influences captured by the independent variables, pending inspection contingency properties sell 16.4% more quickly, and backup contract properties in about 11.4% fewer days. However, the sale of other property contingency transactions requires 13.6% more time to sell. As expected, larger houses increase time-on-the-market, new construction homes sell 3.3% quicker than existing homes, and foreclosed homes sell in about 7.4% fewer days. Agents offered higher commission sell homes 3% more quickly for an additional 1% of commission, listing agents that sell their own listings sell them in 6.3% fewer days, and TOM declines for more productive listing agents.

Table 6 reports the findings of the OLS and instrumental variables (IV) price models.[24] These models include month, year, and location fixed effects; clustered location standard errors are utilized and are robust to heteroscedasticity and intergroup correlation. The OLS model explains 85% of the variation. The instrumental variable (IV) model includes time-on-the-market, an endogenous variable, and the

[24] Prior to estimating coefficients in the price model, a test of sample selection bias is conducted using by applying the Heckman procedure with a probit model; the dependent variable is a binary variable indicating the presence of a contingency clause. The test is to determine if using the reduced sample size of agents that report the contingencies is appropriate, and if the sample is representative of the broader sample of transactions. The data set for this test requires adding the additional observations of agents not reporting a contingency clause. The first step probit model of contingencies provides the inverse Mills ratio which enters the second step hedonic pricing model. A test of rho (sample selection coefficient) and a Wald test of independence of the probit and linear regressions indicates that there is not a sample selection problem. Therefore, the coefficients in the price model should be unbiased with regard to a contingency clause sample selection problem.

natural log of the number of listing agents' properties sold is selected as the TOM instrument.[25] Test for weak- and under-identification confirm the appropriateness of the agent productivity instrument.[26] The loglikelihood, Akaike Information Criterion, and Bayesian Information Criterion are shown in Table 5 to compare the models.

The OLS model indicates that third-party approval contingency properties sell for 3.7% less while closing on other contingency clause properties sell at a 2.2% premium.[27] The other contingency clauses are not statistically significant. The other regression coefficients are largely as anticipated. A 10% larger house increases the selling price by 4.7%, and house price decreases with age. New construction offers a 1% price premium, and homes with a view sell at higher prices, ranging from 14.2% for a golf course view to 3.6% for a garden view. When time-on-the-market is considered, third-party approval properties sell for 3.3% less.

The IV model findings in the far-right column include time on the market. The findings indicate that the selling price increases with TOM, consistent with most previous research, supporting the expectation that sellers should be able to receive a higher price by extending their marketing time. Third-party approval contingency properties sell for 3.3% less, holding constant the effects of TOM. Sellers receive a 2.4% premium for a buyer's pending inspection contingency clause. Comparing the OLS and IV model results, the shorter TOM of pending inspection properties appears to explain the price premium. A 2.1%

[25] Previous empirical work supports the use of brokerage variables as instruments for explaining TOM. More productive agents have a lower TOM, and their productivity is also related to market conditions.

[26] A series of tests examine under-identification and weak identification. The under-identification test is whether the excluded instruments are correlated with endogenous regressors. The Kleibergen-Paap LM statistic is 24.17; the test indicates that the model is heteroscedastic-robust, and rejection of the null hypothesis indicates that the model is not under-identified. The weak identification test, the Kleibergen-Paap Wald F statistic, is 62.83, and the Stock-Yogo weak identification critical value for the 10% maximal IV size threshold is 16.38; the findings shows that the instruments are strongly correlated with the TOM endogenous variable. The price model including the contingency clause interaction terms has Kleibergen-Paap LM and F statistics of 23.58 and 59.79, respectively, also indicating no evidence of under identification or weak identification.

[27] Binary coefficients are transformed to a percentage price change using the equation $y = (e^x - 1) * 100$, where $x$ is the binary coefficient and $y$ is the percentage price change

price discount occurs for closing of other property contingency clauses in the IV model only, consistent with a longer TOM for these properties, and therefore, a lower time-adjusted price. The other contingency clauses are not statistically significant. The inclusion of TOM has a modest effect on most other model coefficients with some exceptions. For example, a 10% larger house increases price by 3.9% compared to 4.7% in the OLS model, and a 10% older house reduces price by 0.36% compared to 0.45% in the OLS model.

## 7) Implications and Conclusions

This study examines six standard contingency clauses often found in residential real estate purchase contracts and their relation to time-on-the-market and closing prices. The six contingency clauses are third-party approvals required by the seller, pending inspections of a seller's property, a backup contract on the seller's property, closing on other property, sale of other property, and a lease/purchase option for the buyer.

The probability of a contract with a particular contingency clause is related to TOM, occupancy, overpricing, and brokerage variables. The probability of a third-party approval or sale of another property contingency clause increases with TOM. The probability decreases for pending inspection properties and backup contract clause properties. The former properties may be less likely to have defects delaying the closing. In contrast, the latter properties appear to increase the buyer's urgency to close on a property instead of losing it to the backup bidder. Occupancy increases the probability of all contingency clauses except for pending inspections; these sellers may not have as much urgency to sell. Sellers appear to be seeking a higher closing price for properties with specific clauses, including pending inspections, backup contract, close of another property, and lease options; a higher list price premium signals a higher desired price. More productive agents usually want a quicker sale. Therefore, they are less likely to have

contingency clauses for third-party approval, backup contract, sale of another property, and close of another property. Conversely, listing agents that sell their own listings often know their sellers' needs and motivations better, which may explain why they more often have the sale of another property and the close of another property contingency clauses in their purchase contracts, while they less often have clauses for pending inspections and backup contracts which are often in high demand.

The pricing results of this study are consistent with risk and return tradeoff for buyers and sellers, most often when factoring in time-on-the-market. Third-party approvals are less certain and require more steps to complete a sale, resulting in a $14,180 average price discount. Conversely, a pending inspection clause reduces a buyer's risk but produces a 2.4% price premium, or $10,313 for the average home. The backup contract contingency clause is related to enhanced demand for a property. Buyers are willing to pay a 2.2% premium to secure the high-demand property they have chosen; the increase is about $9,453 based on the average property price. The sale of other property clause appears to have substantial risk for the seller, but the discount is 2.1% when considering the longer TOM; the average price discount is $9,023.

This study has important implications for buyers and sellers of residential real estate. Sellers of properties with low demand can compensate by accepting contingencies such as the sale of the buyer's property. A seller with strong buyer demand that takes advantage of backup contracts may receive a price premium by adding this clause to the interested buyer's purchase contract. Also, a seller with a property in excellent condition may extract a price premium for a pending inspection clause.

A limitation is that complex contingencies cannot be recorded as a separate data item in real estate contracts and, therefore, cannot be easily extracted from MLS data. As an example, the lease option is relatively small, and more information is needed to understand its valuation. More studies should be

conducted to ensure that the findings reported in this study are consistent across other geographic areas and property classifications.

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## Table 1. Descriptive Statistics

| | Full Sample | | No Contingency Sample | | Any Contingency Sample | |
|---|---|---|---|---|---|---|
| **Variable** | **Mean** | **Std. dev.** | **Mean** | **Std. dev.** | **Mean** | **Std. dev.** |
| Property TOM (days) | 60.094 | 75.904 | 63.964 | 79.854 | 56.558 | 71.926 |
| Market TOM (days) | 60.094 | 4.871 | 60.002 | 4.891 | 60.177 | 4.851 |
| Property closing price | 429,689.700 | 505,469.800 | 458,944.100 | 613,374.900 | 402,965.000 | 379,111.900 |
| List price premium (%) | 3.493 | 22.624 | 4.232 | 24.025 | 2.817 | 21.241 |
| Any contingency (binary) | 0.523 | 0.499 | - | - | 1.000 | - |
| Third-party approval (binary) | 0.151 | 0.358 | - | - | 0.289 | 0.454 |
| Pending inspection (binary) | 0.301 | 0.459 | - | - | 0.576 | 0.494 |
| Backup contract (binary) | 0.045 | 0.207 | - | - | 0.086 | 0.280 |
| Sale of other property (binary) | 0.018 | 0.132 | - | - | 0.034 | 0.181 |
| Closing on other property (binary) | 0.007 | 0.082 | - | - | 0.013 | 0.113 |
| Lease option contingency (binary) | 0.001 | 0.034 | - | - | 0.002 | 0.047 |
| House heated square feet | 1,968.499 | 926.176 | 2,014.269 | 1,018.384 | 1,926.687 | 830.891 |
| House age | 42.485 | 22.681 | 42.417 | 22.982 | 42.547 | 22.403 |
| Bedrooms | 3.478 | 0.885 | 3.497 | 0.887 | 3.460 | 0.882 |
| Bathrooms | 2.398 | 1.004 | 2.435 | 1.072 | 2.363 | 0.935 |
| New construction (binary) | 0.124 | 0.329 | 0.124 | 0.329 | 0.124 | 0.330 |
| Occupied house (binary) | 0.600 | 0.490 | 0.583 | 0.493 | 0.616 | 0.486 |
| Spa (binary) | 0.038 | 0.191 | 0.040 | 0.195 | 0.037 | 0.188 |
| Water view (binary) | 0.089 | 0.284 | 0.089 | 0.285 | 0.088 | 0.283 |
| Garden view (binary) | 0.343 | 0.475 | 0.339 | 0.473 | 0.346 | 0.476 |
| Golf course view (binary) | 0.005 | 0.068 | 0.005 | 0.068 | 0.005 | 0.068 |
| Pool view (binary) | 0.108 | 0.311 | 0.112 | 0.315 | 0.105 | 0.307 |
| Other view (binary) | 0.177 | 0.381 | 0.172 | 0.378 | 0.180 | 0.384 |
| Tile roof (binary) | 0.448 | 0.497 | 0.457 | 0.498 | 0.439 | 0.496 |
| Boat dock (binary) | 0.016 | 0.125 | 0.019 | 0.136 | 0.013 | 0.115 |
| Inground pool (binary) | 0.233 | 0.423 | 0.240 | 0.427 | 0.227 | 0.419 |
| Acres | 0.209 | 0.170 | 0.213 | 0.176 | 0.205 | 0.164 |
| Carport (binary) | 0.149 | 0.356 | 0.149 | 0.356 | 0.148 | 0.355 |
| Garage (binary) | 0.561 | 0.496 | 0.565 | 0.496 | 0.558 | 0.497 |
| Cash sold terms (binary) | 0.226 | 0.418 | 0.277 | 0.447 | 0.180 | 0.384 |
| Short sale (binary) | 0.008 | 0.088 | 0.005 | 0.073 | 0.010 | 0.100 |
| Foreclosure (binary) | 0.038 | 0.190 | 0.044 | 0.204 | 0.032 | 0.177 |
| Transaction broker commission (%) | 2.819 | 0.386 | 2.816 | 0.412 | 2.822 | 0.362 |
| Same selling and listing agent (binary) | 0.170 | 0.375 | 0.184 | 0.387 | 0.157 | 0.364 |
| Num. Listing agent's properties sold | 94.369 | 228.508 | 95.652 | 211.144 | 93.196 | 243.289 |
| N = | 43,395 | | 20,717 | | 22,678 | |

## Table 2. Descriptive Statistics by Contingency Contract

| | Third-Party Approval | | Pending Inspections | | Backup Contract | |
|---|---|---|---|---|---|---|
| **Variable** | **Mean** | **Std. dev.** | **Mean** | **Std. dev.** | **Mean** | **Std. dev.** |
| Property TOM (days) | 61.439 | 76.008 | 52.751 | 69.717 | 58.812 | 70.235 |
| Market TOM (days) | 60.230 | 5.005 | 60.189 | 4.769 | 59.833 | 4.708 |
| Property closing price | 387,755.100 | 349,894.900 | 400,792.600 | 393,471.200 | 459,906.600 | 404,234.100 |
| List price premium (%) | -0.156 | 22.789 | 3.713 | 20.629 | 5.306 | 18.912 |
| House heated square feet | 1,924.407 | 826.303 | 1,900.011 | 820.936 | 2,035.185 | 882.075 |
| House age | 42.388 | 22.415 | 42.952 | 22.295 | 43.552 | 22.221 |
| Occupied house (binary) | 0.632 | 0.482 | 0.579 | 0.494 | 0.729 | 0.445 |
| Short sale (binary) | 0.025 | 0.157 | 0.004 | 0.059 | 0.005 | 0.068 |
| Foreclosure (binary) | 0.023 | 0.150 | 0.042 | 0.202 | 0.009 | 0.096 |
| Transaction broker commission (%) | 2.844 | 0.334 | 2.809 | 0.370 | 2.851 | 0.368 |
| Same selling and listing agent (binary) | 0.188 | 0.391 | 0.138 | 0.345 | 0.152 | 0.359 |
| Num. Listing agent's properties sold | 67.671 | 120.598 | 117.977 | 303.986 | 48.004 | 91.197 |
| N = | 6,565 | | 13,058 | | 1,941 | |

## Table 3. Descriptive Statistics by Contingency Contract

| | Sale of Other Property | | Close of Other Property | | Lease Option | |
|---|---|---|---|---|---|---|
| **Variable** | **Mean** | **Std. dev.** | **Mean** | **Std. dev.** | **Mean** | **Std. dev.** |
| Property TOM (days) | 69.010 | 73.747 | 67.698 | 71.943 | 65.157 | 55.272 |
| Market TOM (days) | 60.353 | 5.222 | 60.491 | 4.966 | 58.857 | 3.841 |
| Property closing price | 406,280.600 | 268,018.900 | 447,570.400 | 387,482.100 | 442,019.900 | 433,434.800 |
| List price premium %) | 4.993 | 20.908 | 6.303 | 21.056 | 8.445 | 18.298 |
| House heated square feet | 2,053.383 | 829.118 | 2,092.868 | 869.316 | 2,051.882 | 1,114.492 |
| House age | 37.036 | 23.166 | 36.207 | 22.866 | 40.431 | 24.663 |
| Occupied house (binary) | 0.763 | 0.426 | 0.746 | 0.436 | 0.745 | 0.440 |
| Short sale (binary) | 0.009 | 0.095 | - | - | - | - |
| Foreclosure sale - REO (binary) | 0.004 | 0.062 | 0.003 | 0.058 | 0.039 | 0.196 |
| Transaction broker commission (%) | 2.798 | 0.397 | 2.813 | 0.402 | 2.843 | 0.394 |
| Same selling and listing agent (binary) | 0.210 | 0.407 | 0.163 | 0.370 | 0.314 | 0.469 |
| Num. Listing agent's properties sold | 27.628 | 50.855 | 35.749 | 56.349 | 73.843 | 109.512 |
| N = | 768 | | 295 | | 51 | |

**Table 4. Probit, Marginal Effects of Third-Party Approval, Pending Inspections, and Backup Contract**

| | Third-Party Approval | | | Pending Inspections | | | Backup Contract | | |
|---|---|---|---|---|---|---|---|---|---|
| **Variable** | **Coeff.** | **T-Value** | | **Coeff.** | **T-Value** | | **Coeff.** | | **T-Value** |
| Market TOM (days) | 0.0010 | 2.51 | ** | 0.0014 | 2.77 | ** | -0.0005 | ** | -1.98 |
| Property TOM (days) | 0.0001 | 2.36 | ** | -0.0003 | -6.84 | *** | 0.0000 | ** | -2.45 |
| List price premium (%) | -0.0011 | -9.08 | *** | 0.0003 | 2.23 | ** | 0.0001 | * | 1.69 |
| Occupied house | 0.0103 | 2.50 | ** | -0.0124 | -3.43 | *** | 0.0201 | *** | 8.81 |
| House heated square feet | 0.0000 | 0.13 | | 0.0000 | -1.56 | | 0.0000 | *** | 3.85 |
| House heated sq. feet squared. | 0.0000 | -2.37 | ** | 0.0000 | -0.56 | | 0.0000 | *** | -3.80 |
| House age | 0.0007 | 1.60 | | 0.0010 | 2.07 | ** | 0.0006 | ** | 2.14 |
| House age squared | 0.0000 | -1.89 | ** | 0.0000 | -2.01 | ** | 0.0000 | | -1.48 |
| Short sale | 0.2262 | 12.21 | *** | -0.1754 | -5.71 | *** | -0.0280 | ** | -2.20 |
| Foreclosure sale - REO | -0.0420 | -3.12 | *** | -0.0024 | -0.16 | | -0.0317 | *** | -3.50 |
| Transaction broker commission (%) | 0.0259 | 5.77 | *** | -0.0097 | -1.07 | | 0.0074 | ** | 2.14 |
| Same selling/listing agent | 0.0083 | 1.58 | | -0.0633 | -8.01 | *** | -0.0073 | ** | -2.42 |
| Num. listing agent's properties sold | -0.0001 | -8.87 | *** | 0.0001 | 10.62 | *** | -0.0001 | *** | -3.62 |
| N | 43,395 | | | 43,395 | | | 43,395 | | |
| Logliklihood | -18,095.92 | | | -26,237.54 | | | -7,745.09 | | |
| Wald Chi-square | 804.67*** | | | 533.46*** | | | 423.35*** | | |

| | Sale of Other Property | | | Close of Other Property | | | Lease Option | | |
|---|---|---|---|---|---|---|---|---|---|
| **Variable** | **Coeff.** | **T-Value** | | **Coeff.** | **T-Value** | | **Coeff.** | | **T-Value** |
| Market TOM (days) | 0.0002 | 1.02 | | 0.0001 | 1.39 | | -0.0001 | ** | -2.12 |
| Property TOM (days) | 0.0000 | 2.31 | ** | 0.0000 | 1.01 | | 0.0000 | | 0.32 |
| List price premium (%) | 0.0001 | 1.28 | | 0.0000 | 1.92 | ** | 0.0000 | * | 1.73 |
| Occupied house | 0.0103 | 6.82 | *** | 0.0035 | 3.69 | *** | 0.0008 | * | 1.91 |
| House heated square feet | 0.0000 | 2.24 | ** | 0.0000 | 1.58 | | 0.0000 | | -0.51 |
| House heated sq. feet squared | 0.0000 | -2.40 | ** | 0.0000 | -1.25 | | 0.0000 | | 0.68 |
| House age | -0.0004 | -3.02 | *** | -0.0001 | -1.84 | * | 0.0000 | | -1.58 |
| House age squared | 0.0000 | 1.81 | * | 0.0000 | 0.90 | | 0.0000 | | 1.58 |
| Transaction broker commission (%) | -0.0036 | -1.76 | * | -0.0007 | -0.62 | | 0.0001 | | 0.12 |
| Same selling/listing agent | 0.0052 | 3.21 | *** | -0.0001 | -0.06 | | 0.0010 | ** | 2.39 |
| Num. listing agent's properties sold | -0.0001 | -6.45 | *** | 0.0000 | -4.97 | *** | 0.0000 | | -0.21 |
| N | 43,395 | | | 43,395 | | | 43,395 | | |
| Logliklihood | -3,696.71 | | | -1,717.08 | | | -385.34 | | |
| Wald Chi-square | 256.91*** | | | 104.12*** | | | 41.14*** | | |

The dependent variable is binary for the type of contingency contract. The independent variables are as described in the first column. All models include month (n = 11), year (n = 5), and zip code address (n = 76) fixed effects dummy variables. Clustered zip code standard errors as shown are robust to heteroscedasticity and arbitrary intragroup correlation. Statistical significance levels indicated by * (10%), ** (5%), and *** (1%).

**Table 5. Duration Models of Time on-the Market and Contract Contingencies**
**Dependent Variable = Ln(Time on the Market)**

| | Lognormal AFT | | | Weibull AFT | | | Generalized Gamma | | |
|---|---|---|---|---|---|---|---|---|---|
| **Variable** | **Coeff.** | | **T-Value** | **Coeff.** | | **T-Value** | **Coeff.** | | **T-Value** |
| Intercept | 2.909 | *** | 33.19 | 3.327 | *** | 39.76 | 3.057 | *** | 36.26 |
| Third-party approval | -0.024 | | -1.33 | -0.002 | | -0.12 | -0.013 | | -0.80 |
| Pending inspection | -0.172 | *** | -10.84 | -0.142 | *** | -8.70 | -0.164 | *** | -10.29 |
| Backup contract | -0.116 | *** | -3.97 | -0.108 | *** | -4.27 | -0.114 | *** | -4.30 |
| Sale of other property | 0.152 | *** | 4.11 | 0.102 | *** | 2.79 | 0.136 | *** | 3.84 |
| Closing on other property | 0.060 | | 1.08 | 0.027 | | 0.53 | 0.057 | | 1.10 |
| Lease option contingency | 0.221 | | 1.40 | 0.072 | | 0.55 | 0.163 | | 1.10 |
| House heated square feet | 0.000 | *** | 11.44 | 0.000 | *** | 12.99 | 0.000 | *** | 12.59 |
| House heated sq. feet sqrd. | 0.000 | *** | -7.06 | 0.000 | *** | -9.59 | 0.000 | *** | -8.35 |
| House age | -0.010 | *** | -5.33 | -0.010 | *** | -6.35 | -0.010 | *** | -5.80 |
| House age squared | 0.000 | *** | 4.74 | 0.000 | *** | 5.35 | 0.000 | *** | 4.99 |
| Bedrooms | 0.026 | ** | 2.47 | 0.019 | * | 1.73 | 0.024 | ** | 2.33 |
| Bathrooms | -0.001 | | -0.12 | -0.012 | | -1.03 | -0.005 | | -0.48 |
| New construction | -0.037 | ** | -2.05 | -0.041 | ** | -2.27 | -0.033 | * | -1.87 |
| Occupied house | -0.002 | | -0.11 | 0.018 | | 1.05 | 0.005 | | 0.27 |
| Spa | -0.023 | | -0.75 | -0.050 | * | -1.89 | -0.035 | | -1.31 |
| Water view | 0.058 | *** | 2.77 | 0.053 | *** | 2.71 | 0.058 | *** | 3.07 |
| Garden view | -0.005 | | -0.38 | -0.005 | | -0.35 | -0.004 | | -0.27 |
| Golf course view | 0.109 | | 1.16 | 0.050 | | 0.61 | 0.110 | | 1.29 |
| Pool view | -0.006 | | -0.28 | -0.018 | | -0.86 | -0.013 | | -0.64 |
| Other view | -0.005 | | -0.34 | -0.002 | | -0.10 | -0.004 | | -0.28 |
| Tile roof | 0.030 | * | 1.76 | 0.007 | | 0.40 | 0.024 | | 1.38 |
| Boat dock | -0.031 | | -0.74 | -0.001 | | -0.03 | -0.018 | | -0.47 |
| Inground pool | -0.046 | ** | -2.00 | -0.040 | ** | -1.96 | -0.046 | ** | -2.20 |
| Acres | 0.209 | *** | 3.82 | 0.251 | *** | 4.56 | 0.229 | *** | 4.24 |
| Carport | -0.020 | | -1.13 | -0.025 | | -1.56 | -0.020 | | -1.20 |
| Garage | 0.008 | | 0.41 | -0.003 | | -0.18 | 0.003 | | 0.18 |
| Cash sold terms | -0.123 | *** | -6.02 | -0.055 | *** | -2.66 | -0.102 | *** | -5.25 |
| Short sale | -0.013 | | -0.12 | 0.178 | | 1.29 | 0.046 | | 0.43 |
| Foreclosure sale - REO | -0.030 | | -1.10 | -0.123 | *** | -3.52 | -0.074 | ** | -2.48 |
| Transaction broker commission (%) | 0.015 | | 1.02 | 0.060 | *** | 3.43 | 0.031 | * | 1.94 |
| Same selling and listing agent | -0.092 | *** | -5.01 | -0.030 | * | -1.68 | -0.063 | *** | -3.56 |
| Num. Listing agent's properties sold | 0.000 | *** | -4.07 | 0.000 | *** | -6.09 | 0.000 | *** | -5.27 |
| List price premium (%) | 0.003 | *** | 7.27 | 0.002 | *** | 3.70 | 0.003 | *** | 6.26 |
| Month/year fixed effects | YES | | | YES | | | YES | | |
| Address zip code fixed effects | YES | | | YES | | | YES | | |
| ln(Sigma) | 0.14 | *** | 26.21 | | | | 0.11 | *** | 18.00 |
| Sigma | 1.15 | | | | | | 1.11 | | |
| Ln(Rho) | | | | -0.04 | *** | -5.82 | | | |
| Rho | | | | 0.96 | | | | | |
| Kappa | | | | | | | 0.38 | *** | 13.43 |
| N | 43,395 | | | 43,395 | | | 43,395 | | |
| Logliklihood | -67,708.25 | | | -68,347.86 | | | -67,272.83 | | |
| AIC | 135,516.50 | | | 136,795.70 | | | 134,647.70 | | |
| BIC | 135,950.40 | | | 137,229.60 | | | 135,090.20 | | |

Note: The dependent variable is the natural logarithm of time-on-the-market (TOM) in days. The independent variables are as described in the first column; binary variables are noted in Table 1. All models include month (n = 11), year (n = 5), and zip code address (n = 76) fixed effects dummy variables. Clustered zip code standard errors as shown are robust to heteroscedasticity and arbitrary intragroup correlation. Statistical significance levels indicated by * (10%), ** (5%), and *** (1%).

**Table 6. Regressions of Property Selling' Price and Contract Clauses**
**Dependent Variable = Ln(Selling Price)**

| | OLS Model | | IV Model | |
|---|---|---|---|---|
| **Variable** | **Coeff.** | **T-Value** | **Coeff.** | **T-Value** |
| Intercept | 8.905 *** | 46.22 | 9.006 *** | 45.46 |
| Ln(Time-on-the-market) | - | - | 0.135 *** | 3.55 |
| Third-party approval | -0.038 *** | -9.70 | -0.033 *** | -7.39 |
| Pending inspection | 0.000 | 0.02 | 0.024 *** | 2.71 |
| Backup contract | 0.008 | 1.06 | 0.022 ** | 2.38 |
| Sale of other property | 0.000 | -0.03 | -0.021 | -1.60 |
| Closing on other property | 0.022 * | 1.77 | 0.012 | 0.82 |
| Lease option contingency | 0.021 | 0.74 | -0.010 | -0.28 |
| Ln(House heated square feet) | 0.473 *** | 18.22 | 0.393 *** | 11.39 |
| Ln(House age) | -0.045 *** | -5.83 | -0.036 *** | -4.47 |
| Ln(Bedrooms) | 0.063 *** | 3.25 | 0.052 *** | 2.69 |
| Ln(Bathrooms) | 0.123 *** | 8.44 | 0.126 *** | 8.79 |
| New construction | 0.010 *** | 2.65 | 0.016 *** | 3.29 |
| Spa | 0.084 *** | 8.18 | 0.082 *** | 8.57 |
| Water view | 0.046 *** | 4.03 | 0.038 *** | 3.32 |
| Garden view | 0.035 *** | 5.90 | 0.035 *** | 5.46 |
| Golf course view | 0.133 *** | 3.19 | 0.116 ** | 2.45 |
| Pool view | 0.052 *** | 6.92 | 0.051 *** | 7.23 |
| Other view | 0.007 | 1.54 | 0.007 | 1.45 |
| Tile roof | 0.028 *** | 2.69 | 0.024 ** | 2.42 |
| Boat dock | 0.331 *** | 5.65 | 0.332 *** | 5.82 |
| Inground pool | 0.109 *** | 11.28 | 0.114 *** | 11.83 |
| Ln(Acres) | 0.046 *** | 2.93 | 0.045 *** | 3.02 |
| Carport | 0.030 *** | 7.05 | 0.031 *** | 6.48 |
| Garage | 0.062 *** | 7.66 | 0.062 *** | 6.99 |
| Occupied house | 0.036 *** | 7.39 | 0.035 *** | 5.97 |
| Cash sold terms | -0.145 *** | -7.93 | -0.128 *** | -6.94 |
| Short sale | -0.177 *** | -8.87 | -0.175 *** | -6.57 |
| Foreclosure sale - REO | -0.106 *** | -13.34 | -0.099 *** | -12.09 |
| R-squared | 0.85 | | - | |
| Logliklihood | 2,761.31 | | -5,085.24 | |
| AIC | -5,436.63 | | 10,258.48 | |
| BIC | -5,063.47 | | 10,640.31 | |
| N | 43,395 | | 43,395 | |

Note: The dependent variable is the natural logarithm of the property selling price. The independent variables are described in the first column; binary variables are noted in Table 1. All models include month (n = 11), year (n = 5), and zip code address (n = 76) fixed effects dummy variables. Clustered zip code standard errors as shown are robust to heteroscedasticity and arbitrary intragroup correlation. The endogenous regressor is ln(TOM), and the instrument is the natural log of the number of listing agents' properties sold. Statistical significance levels indicated by * (10%), ** (5%), and *** (1%).