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A Comparison of the Appraisal Process for Auction and Private Treaty Residential Sales*

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Abstract

This paper examines residential sale mechanisms from an appraisal perspective and empirically tests for differences in the valuation process for auctioned and private treaty sales. We test the hypothesis that agents use different criteria in preparing the guide prices for auctioned housing, with an element of under pricing in order to aid in the marketing of the property. The empirical tests are undertaken on a sample of auctioned and private treaty sales in Dublin, Ireland for the period of 1997-2004. We find that the evidence is consistent with the hypothesis that agents do adjust valuations for auctions to attract additional potential bidders.

Keywords: Real Estate Auctions, Auction Price Premium,
JEL Classification: D44, L85

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1: Introduction

The issue of sale mechanisms for residential property transactions has attracted increasing attention in recent years. Recent studies have both theoretically and empirically examined a number of aspects of housing sales, including the choice of sale mechanism (e.g. Lusht, 1996), its impact upon the achieved sale price (Mayer, 1998 and Dotzour, et al., 1998), the probability of a successful sale (Ong et al., 2005) and the sale of properties withdrawn or unsold at auction (Ong, 2006). One aspect of pricing behavior in residential markets that has, however, received less attention concerns the appraisal process underlying different sale mechanisms. While there is a large literature to have examined the appraisal process, it has largely examined private treaty sales and has been concerned with revisions to the guide price¹. Using data from Dublin, Ireland, this paper examines whether the choice of sale mechanism impacts upon the final sale price obtained. In addition, it also examines whether the sale mechanism utilized has a material effect on the advertised guide price for the property.

As is the case with markets such as Australia (Lusht, 1996) and New Zealand (Dotzour et al., 1998), English open-outcry auctions are a popular form of sale mechanism in Ireland, particularly at the premium end of the market. This is in contrast to the situation in countries such as the United States (Mayer, 1998) and Singapore (Ong et al., 2005) where auctions are primarily used in the context of foreclosure and bankruptcy sales. Given the existing empirical evidence available from markets such as Australia, and from the general auction theory literature, we would expect to observe that auctioned properties achieve higher sale prices than those sold privately. However, our examination of the published guide prices is based on their use as a marketing tool and can be linked with those papers that have examined

the importance of the number of bidders in relation to both the probability of a successful auction sale and the final price realized. The importance of the number of bidders in obtaining higher prices at auction is shown in early papers on auction theory such as Holt (1979) and Harris & Raviv (1981) as well as in real estate based empirical work such as Lusht (1996). Two recent papers also highlight the importance of the number of bidders in slightly different contexts. Ong (2006) shows that in the context of post auction private treaty sales the number of bidders at the auction, although unsuccessful, did have an impact upon the price obtained, while Ooi et al. (2006) report that the number of bidders impacts upon sale prices in the context of sealed bid auctions. Lusht (1996) notes that if one assumes that bids at an auction are not independent but affiliated then the actual auction process reveals additional information not observed in the case of independent bids. This has the effect of bidders encouraging one another, a case where each bidder's private valuation of the property will be effected by the information conveyed about other bidders' valuation. If one bidder assigns a higher valuation then this may lead to others upwardly revising their assessment and appraisal of the property. According to Milgrom & Weber (1982) English open-outcry auctions will be revenue maximizing relative to sealed bid auctions if the bids are affiliated and the participants are risk neutral. Sealed bid auctions in comparison, will maximize revenue in the case of independent bids and risk-averse bidders.

This paper builds upon evidence presented in a recent paper, Stevenson & Young (2004), which showed that the sale price for auctioned properties in Dublin was statistically significantly higher than the advertised guide price for the property. In contrast, private treaty sale prices were insignificantly different from the quoted guide. While the analysis illustrated that there is a premium over guide in the case of auctions at statistically significant levels, the paper did not control for the fact that auction sales are concentrated at the higher end of the market. Nor does the paper attempt to explain why this premium over guide may exist. Due to the empirical approach adopted in the current paper we also hope to control for general market movements and the possibility that the strong price dynamics in the Irish market

during the sample period may have also contributed to the observed premium. Roche (2001), McQuinn (2004) and Stevenson (2008) all show that actual house prices were at times in excess of fundamentals during much of the time period examined in the current paper. While all three papers show that the majority of the price increases observed can be explained by economic and demographic fundamentals together with the presence of supply constraints in the market during the late nineties (Kenny, 1999, 2003), it does not preclude the presence of speculative behavior driven by extrapolative and myopic expectations on the part of market participants.

The key testable hypothesis in the current paper is concerned with the initial valuation of auctioned properties. To test this we examine the importance of the sale mechanism in terms of the realized sale price and the advertised guide price. In relation to the impact on price it is hypothesized that given the type of properties generally sold at auction in Dublin, and its similarities with markets such as Australia and New Zealand, auctioned properties should sell at a premium in comparison to negotiated sales. In contrast, however, by testing the guide prices it is possible to assess whether any element of underpricing takes place. If the corresponding sale mechanism dummy in the examination of guide prices is negative it would indicate that agents do adjust valuations for auctions to attract additional potential bidders and that any observed auction premium is at least partly related to this under pricing. If these results are found it may be that previous empirical evidence has to some extent over-estimated the importance of the actual auction process in the realization of an auction premium. If, however, the coefficient is either insignificant or positive it would imply that the observed premium in auction sale prices over guides is solely the result of a combination of market conditions and the general characteristics of English auctions². The remainder of the paper is laid out as follows. Section 2 discusses relevant aspects of the existing literature on sale mechanisms. Section 3 details the data used in the empirical analysis, the key findings of which are reported in Section 4. Section 5 provides concluding comments.

2: Real Estate Sale Mechanism Literature

The majority of the literature concerned with residential auctions has examined whether houses sell at lower or higher prices in comparison with a private treaty negotiated sale³. A number of studies have illustrated that auctioned properties should sell at a discount in comparison to private treaty sales. These findings are however, contrary to much auction theory and to a large extent are based on the type of market examined. In the case of the United States, for example, most auctioned properties involve foreclosures or bankruptcies at the lower end of the market and sell at discounts (Allen & Swisher, 2000 and Allen, 2001)⁴. In relation to the observed auction discount, Mayer (1995) argues that as private sellers can wait longer they would receive a higher price from a more matched buyer. Mayer refers to the auction discount as the *cost of liquidity*. This argument is also presented by Adams, et al. (1992). Mayer (1995) does however acknowledge that his model assumes that a seller cannot adjust the price in the face of two bidders willing to pay the guide price. Therefore, in booming markets, where this may frequently occur, auctions may provide an opportunity to maximize revenue further as bidders can raise prices in excess of the guide price. This is an important point to recognize given the market conditions prevalent in Dublin during the sample period.

The empirical evidence for markets such as the United States is in many respects contrary to auction theory, which generally highlights the preference of auctions over negotiated transactions. In the case of English auctions with no reserve price, Bulow & Klemperer (1996) show that auctions will be preferable to private treaty sales. Wang (1993) illustrates the optimality of auction sales, even in the case when the cost of auctions is high. In this case auctions remain preferable over private treaties if the marginal revenue curve associated with the bidder's valuation is sufficiently steep. Milgrom (1986) and Wilson (1977) theoretically illustrate that for high quality and more heterogeneous goods auctions will be preferred over private treaty⁵. In many parts of the world, auctions often represent the preferred method of sale for agents at the higher end of the market. Not only may this result in a more

heterogeneous sample of properties and therefore greater uncertainty concerning the valuation, but also as a sale method auctions tend to be used most frequently during booming markets. This can be related back to Mayer's (1995) arguments and to those of Lusht (1996) and Milgrom & Weber (1982) concerning the impact of affiliated bids on auction outcomes. Furthermore, Bulow & Klemperer (1996) show that the competitive nature of auctions will dominate the value of negotiating skills.

In markets similar to Ireland in terms of the type of properties sold through auction, the empirical evidence is broadly supportive of an auction premium. Newell et al. (1993) and Lusht (1996) report such evidence for the Sydney and Melbourne markets respectively, while Dotzour et al. (1998) also provides supporting evidence for Christchurch, New Zealand. Dotzour et al. (1998) also note that in their analysis of submarkets, significant auction premiums were observed only in those areas with above average house prices, while the areas in which no discernable differences were observed are those with below average house prices. In the context of the current paper the heterogeneous nature of the properties generally sold at auction and their high value may also help to explain the observed premium over guide due to enhanced valuation uncertainty.

3: Data and Modeling Framework

The data used in this study consists in its entirety of 2,657 residential prices for the Greater Dublin metropolitan area over the period Quarter 1 1997 through Quarter 3 2004 and in total includes 2,110 auctioned properties and 547 that were sold privately. The sample was based on those properties for which both guide and confirmed sale prices were available. This partly accounts for the relatively small size of the private treaty sample and it does not represent the full extent of the number of private treaty transactions in Dublin during the period under consideration. However, as will be considered shortly, while the sample is comparatively small it is very similar to the sample of auctioned properties in terms of the price at which the properties sold. In this respect, the sample reduces potential selectivity bias in the results. The

sample does include some properties that were initially advertised as being sold through auction, but were either sold privately prior to the auction or alternatively were withdrawn at auction and subsequently sold on a private basis. In the case of those properties that were withdrawn, in each case we have the subsequent private treaty sale price, therefore there is no census bias in this regard. In these cases the guide price was treated as being within the auction sample, as it was prepared as such, while the sale price was viewed as a private treaty observation.

When listing a property for sale and in advertising literature, estate agents provide an estimate of what they think the property will sell for, known as the guide price. This guide price is not a binding commitment for either the seller or the agent as to the final sale price. In particular it should be clearly noted that the guide price and the auction reserve price are not one and the same and that the guide does not influence the reserve. The guide price is rather, the publicly available estimate of the property value as prepared by the estate agent (auction house), and is directly linked with the marketing of the property. It should also be clearly noted that the agents involved in both auction and private treaty sales are the same firms. Therefore, the guide prices are produced by the same firms, the only difference is that the sale mechanism to be adopted will have been decided upon when the guide price is established.

Within the auction setting, guide prices are advertised during the marketing campaign to provide a price indication to potential bidders. Before bidding on the property, potential purchasers must satisfy themselves as to the condition of the property and carry out any condition surveys. As a result, it is relatively easy for an estate agent to monitor interest in the property and recommend a reserve price to the seller that will be used as the minimum acceptable value which the seller will consider. These reserve prices are not disclosed prior to the auction and in most cases are only revealed indirectly by the auctioneer if bidding is proceeding slowly. This price is discreetly disclosed by the auctioneer declaring that the property is 'on the market' after the reserve price point is achieved. As with most English

outcry auctions, if the reserve price is not met, then the seller has the option of withdrawing the property from the market, with custom in Ireland dictating that the right of first negotiation lies with the highest bidder.

Properties sold through auction typically have a 5-week marketing period, with 3 to 4 weeks of advertising followed by private viewings the week prior to the auction⁶. If a property is sold at auction the purchaser must provide a non-refundable deposit of 10% of the successful bid. The purchaser must also sign contracts agreeing the sale will be closed within 6 weeks of the auction date. In comparison, for private treaty sales the deposit is refundable up until the contracts agreeing the sale are signed, typically between 4 to 6 weeks after the price is agreed. Also, public auction results are generally available (except in rare instances) and published in newspapers and other media outlets. Private treaty sale results are generally known by the selling agents, the buyer, the seller, and parties involved in the closing of the sale. Fees, commissions and transaction costs are identical irrespective of the sale method.

4: Empirical Analysis

An important issue in the analysis of sale mechanisms is that of selectivity bias. As papers such as Lusht (1996) and Dotzour et al. (1998) note, a simple hedonic specification including a sale mechanism dummy implicitly assumes that the choice of sale mechanism is exogenous. If however, the decision as to sell the property through auction or private treaty is endogenous, sample selection bias may be present. The issue of sample selection bias is addressed in a broader context in terms of hedonic models in papers such as Haurin & Hendershott (1991) and Jud & Seaks (1994). In relation to the current study, selectivity bias may be induced if the decision on the mechanism adopted is associated with omitted price affecting variables. This can lead to differences in the prices being wrongly attributed to the sale mechanism used, rather than the missing variable. As with studies such as Lusht (1996) and Dotzour et al. (1998) we adopt a two-stage estimation procedure in the form of Lee

(1982). Initially we estimate a probit model designed to model the choice of sale mechanism, and then incorporate a selectivity variable obtained from the probit estimation, into the hedonic models. In the context of the current paper this may arise through the fact that the majority of properties sold through auction in Ireland are at the premium end of the market. This can be illustrated by the data reported in Figure 1, which reports the percentage of properties sold using the auction method across price-based percentiles. The properties are divided into percentiles on an annual basis with aggregate figures then compiled in order to avoid bias due to market movements. Figure 1 clearly shows that auctions are predominantly used at the higher end of the market in terms of value. At the lower percentiles auctions comprise a very low percentage of sales, indeed for the lower six bands auctions make up less than 10% of sales. This figure, however, rises rapidly and to a point where over 60% of sales are conducted using auctions in the highest decile⁷.

Before a more detailed discussion of the methodological approach adopted is provided, it is important to note the summary statistics of the data, as reported in Table 1. While in general auctions dominate the premium end of the market, the data used in this paper has, to a degree inadvertently, reduced this potential bias. The data used is based on those properties for which both guide and sale prices were available. The private treaty sample is largely in the same price range as the auction properties, reducing the effects of the potential selectivity bias. As can be seen the average and median sale prices are similar and the spread of the prices are similar, as shown through the minimum and maximum prices observed. However, there is a marked difference in the guide prices for the two mechanisms and the presence of a premium over guide can be clearly seen in the context of auctioned homes.

To further consider the initial evidence regarding the difference between the guide and sale prices in the cases of the two sale mechanisms we replicate the methodology adopted by Stevenson & Young (2004). This methodological approach was based on the following OLS model:

$$\ln(\text{sale price})_t = \alpha + \beta_1 \ln(\text{guide price})_t + \varepsilon_t \quad (1)$$

The null hypothesis is that the beta coefficient is equal to unity, indicating an insignificant difference between the quoted guide price and the achieved sale price. This would therefore imply the absence of an auction premium. We test for this using the Wald test. We also test for the equality of the means of the different series. The results, reported in Table 2, show that in the case of private treaty sales the Wald Test F-statistic is insignificant, thereby indicating an insignificant difference between the guide and sale price. In addition, the t-test examining the equality of the means of the guide and sale prices in the private treaty sample was insignificant. However, in contrast, the results with respect to the auction sales reveal both tests to be significant at conventional levels. The Wald test is significant at a 95% level illustrating that the coefficient with respect to the guide price is significantly less than the sale price. Furthermore, the simple t-test on the equality of the mean is also significant, in this instance at the 99% level. These findings confirm those of Stevenson & Young (2004) and provide the base empirical evidence that whereas the guide and sale prices in the case of private treaty transactions are not significantly different from each other, the guide prices for properties sold through auction are significantly less than the sale prices achieved. Whereas this analysis provides the necessary base evidence it merely indicates that that an auction premium is present. It does not however imply whether at least part of the observed premium is due to different approaches being adopted with respect to the appraisal of the property.

The same basic pricing variables are utilized in both the probit and OLS hedonic models. The models are estimated in log form. The primary characteristics obtained at an individual property level are the number of bedrooms, number of bathrooms and whether the property had parking facilities. While it would perhaps have been preferable to have a more detailed estimate of square footage, the bedroom variable should hopefully provide an adequate proxy.

The remaining variables divide the properties by both type and submarket. In relation to location the Greater Dublin area is divided into the Central City, South City, North City, South County and Periphery. The inner city is defined by the postcodes (zip codes) D1, D2, D7 and D8. The remaining areas within the City of Dublin are divided based on the River Liffey into North and South. South County Dublin contains all areas within the County of Dublin south of the River Liffey. The peripheral grouping contains all areas in County Dublin not in South County Dublin and also those properties in neighboring countries that can be viewed as part of the greater metropolitan area, including Wicklow, Kildare, Meath and Louth. Property type variables are included for the following types: detached, semi-detached house, bungalow, terrace/mews and apartment. The location dummy excluded is the north city, while bungalows are the excluded property type. Time dummies are also included. While sufficient observations are available to use quarterly dummies, annual ones are used throughout, as the aim of the paper is not concerned with the estimation of hedonic indices. Therefore, eight annual time dummies are used, with the earliest, 1997, excluded in each estimation.

For the hedonic estimation two additional issues are addressed. The first is that a dummy variable is included in the estimation to specify the sale mechanism used. It takes the value of unity if the property was sold at auction and zero if conducted through a private treaty. Ong et al. (2005) illustrate that the agency used may contribute to the probability of a sale occurring and thus is a potentially important variable in the pricing equation. Dummy variables for the six largest agents in the Dublin, who account for over 70% of sales, are included in the model, with the missing variable relating to all remaining agencies⁸. The results from the probit model on sale mechanism choice are displayed in Table 3. The significant χ^2 statistic indicates a significant log-likelihood value. More broadly speaking one interesting finding from the probit model is the relative lack of significant coefficients. Of the property fundamental variables only the parking facilities dummy and that for the apartment property type are significant at conventional levels, while the location variables are all insignificant. It

is of note however, that the time variables for 2001 through 2004 are all negative and significant, implying a trend away from the use of auctions in the Dublin market. Potential reasons behind the falling popularity of auctions as a preferred sale mechanism are an increasing risk of no-sale (Parlane, 2003) and growing public concerns over pricing practices by auctioneers. The selectivity variable derived from the probit model is the inverse of the Mills ratio (Lee, 1982), and is added to the pricing equations reported in Table 4. The lack of significance for either the auction or private treaty samples would indicate that an estimation of the OLS hedonic model without correction is appropriate.

The hedonic models are reported in Tables 5 and 6 for the sale price and guide prices respectively. We would expect the coefficients with respect to property characteristics such as the number of bedrooms and bathrooms and the availability of parking facilities to be positive and significant. The reported coefficients are broadly in line with expectations and are broadly similar for both sale and guide prices. The area proxies, bathrooms and bedrooms, are both positive and significant. While the parking dummy variable is negative it is not significant at conventional levels. For the location and property type variable groupings positive and significant coefficients are reported for apartments, detached properties, South City Dublin and South County Dublin, in line with expectations. As one would expect, detached properties report higher prices, while the increase in the apartment market in Dublin during the sample period can also explain the reported findings for that variable. The south of Dublin, both City and County, is the most affluent district of the metropolitan area, therefore it would be expected that a positive coefficient would be found. Likewise, significant negative responses are observed in both estimations for the peripheral locational markets and the central city. The results with regard to the agencies do have to bear careful interpretation. Whilst it may appear to indicate the relative success of certain agencies the fact that significant positive coefficients are reported for not only prices but also guides for agencies 3 through 6 merely would imply that they tend to operate in higher value submarkets.

While the coefficients are in line with expectations and similar across the two samples, the sale mechanism dummy differs significantly. Based upon the underlying hypothesis of this paper, a positive sale mechanism coefficient indicating an auction premium is expected, consistent with empirical evidence from similar markets such as Australia (Lusht, 1996) and New Zealand (Dotzour et al., 1998). In contrast, if under pricing of the guide price occurs in order to aid in the marketing of an auction property, it would be hypothesized a negative coefficient be reported with respect to the hedonic estimation of guide prices. With regard to sale prices, a positive coefficient is indeed reported. Given the nature of the auction market in Ireland, this is not that surprising and is consistent with prior empirical evidence.

However, the key hypothesis to be tested in this paper concerns the guide price estimation. In this case the sale mechanism dummy is not only negative but also statistically significant. This supports the view that at least some of the premium over guide is due to underpricing by agencies to attract enhanced interest in properties and to increase the number of potential bidders. It should however be noted that if agents are under pricing guides for auction sales they are acting in the best interest of their client through the attraction of more bidders to the auction room. Given that the role of the auction firm is maximize revenue for their client, and that as papers such as Holt (1979), Lusht (1996) and Ong (2006) have all highlighted the positive impact that the number of bidders has on the auction process, the resulting sale would suggest that auction houses are acting in an optimal manner. If this does increase the number of bids, it is then likely to further enhance the relative attractiveness of auctions as a sale mechanism.

In order to provide more information concerning the appraisal process we estimate hedonic models, based on the same specification as previously used, for the private treaty sub-sample. The coefficients obtained from these models, which are reported in the appendix, are then applied to the auction sample. This allows us to obtain an estimate of the guide and sale prices for the auction sample under a private treaty scenario. The results reveal an average

'corrected' guide price of €485,679.66 and an average 'corrected' sale price of €505,356.80, resulting in an average premium of €19,677.14. This figure shows a considerably lower premium over guide, even if just simply compared with the figures contained in Table 1, which reported an actual average premium of €179,749. Furthermore, the observed guide prices for auctioned properties are on average €13,710.94 lower than the hypothetical private treaty estimates. This would add further weight to the argument that agents deliberately undervalue the properties being marketed for sale at auction. With respect to the sale prices we observe an average premium of €95,966.61 of auction transactions over their estimated private treaty sale price.

In addition, based on the estimates for each individual property it is possible to consider whether a higher observed guide discount for auction properties, compared to the 'corrected' guide, results in a higher sale price premium. The difference between the actual and corrected guide prices is calculated, with a similar calculation undertaken for the sale prices. On an absolute basis a correlation of 0.8687 is recorded. The dataset available only allows this form of analysis as factors such as the number of bidders are not available. It is therefore impossible to state more clearly that the use of discounted guide prices does lead to greater advantageous conditions in the auction process. However, the results would imply that a larger discount on valuation does contribute to a higher sale premium⁹.

The empirical evidence presented thus far would imply the presence of affects arising both from the peculiarities of the open-outcry auction system and the use of deliberate underpricing with respect to guide prices as major contributory factors in the existence of a premium in auction sales. As noted in Section 3, papers such as Milgrom (1986) and Wilson (1977) illustrated that auctions will be the preferred sale mechanism in the case of higher quality and more heterogeneous products. While housing markets would generally fit this description, this effect may be even more pronounced with respect to higher worth properties. Therefore to investigate this issue we re-run the different hedonic models using samples split

on the basis of sale price. We split both the private treaty and auction samples based on a €500,000 cut-off. Table 7 reports the hedonic estimations for the sale prices. With respect to the sample in excess of €500,000 the sale mechanism dummy is significant, as with the overall sample. In contrast, the dummy is not significant for the lower valued properties. This is consistent with the theoretical framework of Milgrom (1986) and Wilson (1977) in that the advantages of the auction sale mechanism are more pronounced for higher valued properties. It would also be expected that the higher valued properties are more heterogeneous in nature. In addition, with the lower value sample potential buyers are more likely to encounter issues with respect to affordability constraints that may limit their ability to increase their bid within the auction process.

Table 8 repeats this analysis with respect to the guide prices. These results support the initial findings for the full sample, with a significant sale mechanism dummy. This implies that the underpricing observed in the previous initial analysis is consistent across different price ranges. However, these findings highlight an interesting phenomenon. While the use of lower guide prices for auction properties does appear to aid in producing a significant premium on sale prices in the higher price range, this is not the case for properties in the lower price range. Valuers, however, still effectively discount their guide valuations in an attempt to aid the marketing process regardless of the price category at which the property is likely to sell. While this may initially lead to a conclusion that the use of under pricing across all price ranges is not an optimal strategy for auctioneers to pursue, a number of issues should be noted. In particular, while under pricing the guide doesn't lead to a significant improvement in the realized sale price, it does not lead to a lower one. The coefficient reported is still positive, although insignificant. Unless an auction house was able to accurately determine an effective cut-off point in terms of the price range at which point under pricing achieved its aim, then it is not actually damaging either the auctioneer or the seller by continuing to under price properties for advertising purposes¹⁰.

5: Conclusion

This paper has examined the role of agents appraisal methods in the context of the sale mechanism selected; showing that the difference between the advertised guide price and final sale price for residential properties in Dublin was different at a statistically significant level. This was in contrast to the results found in relation to private treaty sales. A number of possible reasons may explain the divergences observed. Specifically we test the possibility that agents used different criteria in preparing the guide prices for auctioned housing, with under pricing used in order to aid in the marketing of the property through the attraction of additional bidders to the auction.

The empirical findings would support this hypothesis. Not only do we confirm the results from similar markets in that auctioned properties tend to sell at a premium, but in addition we also report a significant difference in guide prices. We find that the sale mechanism dummy in the analysis of guide prices is negative and statistically significant at conventional levels. These findings are also supported by the analysis of the 'corrected' guide and sale prices for the auction sample. This supports the view that at least some of the premium over guide is due to deliberate under pricing by agencies to attract enhanced interest in properties and to increase the number of potential bidders. However, while we find that the use of underpricing is consistent across different price brackets, the existence of a significant premium on sale prices is not. While a significantly higher sale price is not evident, this does not necessarily imply that auctioneers should however cease from the practice of under pricing guide prices, as there is no evidence that it negatively impacts the realized sale price.

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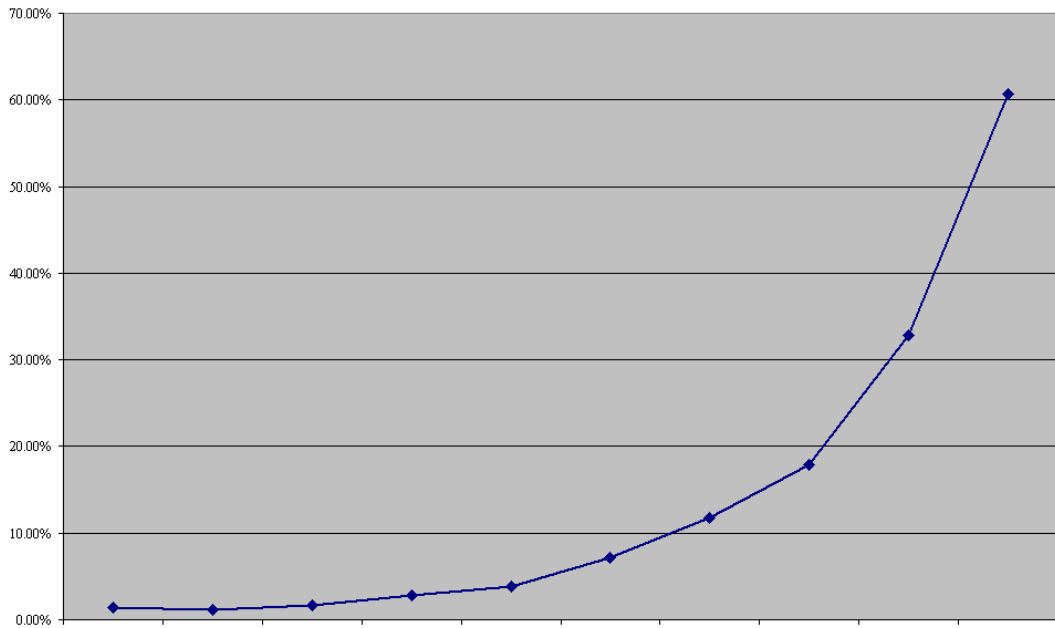
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Tables & Figures

Figure 1: Percentage of Properties Sold at Auction by Price Percentile

Notes: Figure 1 reports the percentage of auction sales across price percentiles. To avoid distortions in the figures due to market movements the percentiles are estimated on an annual basis and then aggregated.

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Table 1: Summary Statistics

	Auctioned Properties	Private Treaty Sales
Panel A: Guide Prices		
Average Price	421,970	611,319
Median Price	327,500	440,000
Maximum Price	4,000,000	4,400,000
Panel B: Sale Prices		
Average Price	601,719	634,200
Median Price	436,000	475,000
Maximum Price	7,800,000	7,500,000

Notes: Table 1 reports the summary statistics for the auction and private treaty samples.

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Table 2: Comparison of Sale and Quoting Prices

Panel A: Private Treaty Sales		
Constant	0.1726	1.1033
Quoting Price	0.9885	82.9740***
Wald Test (F-Statistic)	0.9276	
T-test for Equality of Means	0.3037	
Panel B: Auction Sales		
Constant	0.3777	5.2460***
Quoting Price	0.9863	176.1158***
Wald Test (F-Statistic)	6.0216**	
T-test for Equality of Means	10.3916***	

Notes: Table 2 reports the findings from the model represented in Equation (1). The guide prices are regressed against the dependent variable of the achieved sale price. The Wald test is used to test whether the beta coefficient with respect to the valuation price is significantly different from unity. * indicates significance at a 90% level, ** at a 95% level and *** at a 99% level.

Table 3: Probit Model for Selectivity Bias

	Coefficient	T-Statistic
Constant	2.0846	6.2624***
Bedrooms	0.0784	1.4005
Bathrooms	-0.0501	-0.7400
Parking	0.5734	3.7339***
1998	0.6323	1.6292
1999	0.5694	1.4835
2000	0.5038	1.0946
2001	-1.1511	-4.4150***
2002	-1.1816	-4.6648***
2003	-1.0846	-4.1024***
2004	-1.0372	-3.7314***
Apartment	-1.6764	-5.1618***
Detached	-0.4077	-1.6402
Semi Detached	-0.2656	-1.0839
Terrace/Mews	-0.1302	-0.5102
Central City	0.1434	0.5163
South City	0.2263	1.1299
South County Dublin	0.1973	0.9050
Periphery	0.2357	0.8462
Log Likelihood	-390.6414	
Restricted Log Likelihood	-536.6910	
χ^2 statistic (18 df)	292.0991***	

Notes: Table 3 reports the results from the probit model testing for selectivity bias. The dependent variable is the sale mechanism dummy. * indicates significance at 10%, ** at 5% and *** at 1%.

Table 4: Price Equations

	Auction Sales		Private Treaty Sales	
	Coefficient	T-Statistic	Coefficient	T-Statistic
Constant	11.3512	213.8416***	10.8818	8.1076***
Bathrooms	0.05610	5.3197***	0.2345	3.9318***
Bedrooms	0.1947	21.5155***	0.1891	3.3161***
Parking	0.0068	0.3225	0.0943	0.4886
1998	0.2050	6.4311***	1.1374	2.4830**
1999	0.4489	13.5744***	0.8326	1.9117*
2000	0.5866	15.4467***	0.8237	1.6115
2001	0.7330	16.0711***	1.0866	2.8861***
2002	1.0285	23.0459***	1.2673	3.2876***
2003	1.1432	23.1105***	1.1829	3.2059***
2004	1.3747	28.6616***	1.3499	3.7636***
Apartment	0.1554	2.0609**	0.2381	0.3315
Detached	0.3053	10.4432***	0.4061	1.6261
Semi Detached	0.0263	0.9036	0.2604	1.1290
Terrace/Mews	-0.1114	-2.5984***	0.3288	1.4350
Central City	0.2268	8.5416***	-0.1141	-0.5258
South City	0.1431	5.0213***	-0.0447	-0.2466
South County Dublin	-0.1134	-3.0808***	-0.0524	-0.2707
Periphery	-0.0195	-0.4297	-0.6154	-2.3408**
Agent 1	0.0102	0.2476	0.1011	0.5519
Agent 2	0.0580	1.7561*	0.0835	0.4178
Agent 3	0.1924	3.7276***	0.0366	0.2217
Agent 4	0.1746	5.3349***	0.1658	0.8138
Agent 5	0.0625	2.2361**	-0.0328	-0.2438
Agent 6	0.2245	0.8182	0.0326	0.2310
Selectivity Variable	-0.0119	-0.4270	0.2882	0.2282
R ² adjusted	0.6541		0.5041	

Notes: Table 4 contains the hedonic estimations with the inclusion of the selectivity variable obtained from the estimation reported in Table 3. * indicates significance at 10%, ** at 5% and *** at 1%.

Table 5: OLS Model on Sale Prices

	Coefficient	T-Statistic
Constant	11.0363	59.0537***
Sale Mechanism Dummy	0.3157	1.6966*
Bathrooms	0.0632	6.1347***
Bedrooms	0.1935	21.8465***
Parking	-0.0011	-0.0545
1998	0.2061	6.4962***
1999	0.4493	13.6379**
2000	0.5864	15.4927***
2001	0.7754	18.8449***
2002	1.0603	26.6946***
2003	1.1523	25.1562***
2004	1.3819	30.9389***
Apartment	0.1597	2.1608**
Detached	0.3071	10.7193***
Semi Detached	-0.0093	-0.3368
Terrace/Mews	0.0250	0.8658
Central City	-0.0978	-2.3448**
South City	0.2186	8.3698***
South County Dublin	0.1435	5.1247***
Periphery	-0.1236	-3.4012***
Agent 1	0.0008	0.0194
Agent 2	0.0175	0.4348
Agent 3	0.0609	1.8862*
Agent 4	0.1837	3.7102***
Agent 5	0.1606	5.0647***
Agent 6	0.0604	2.2216**
Selectivity Variable	-0.0384	-0.1989
R ² adjusted	0.6458	

Notes: Table 5 reports the OLS hedonic model on sale prices. The sale mechanism dummy is based upon properties that actually sold at auction or private treaty. Any property advertised as being sold through auction but eventually was transferred through private negotiation is classified as a private treaty sale. * indicates significance at 10%, ** at 5% and *** at 1%.

Table 6: OLS Model on Guide Prices

	Coefficient	T-Statistic
Constant	11.2220	223.2416***
Sale Mechanism Dummy	-0.1374	-6.6110***
Bathrooms	0.0761	8.0699***
Bedrooms	0.1915	23.6771***
Parking	0.0148	0.8608
1998	0.2169	7.4641***
1999	0.4537	15.0015***
2000	0.5990	17.2526***
2001	0.7851	23.3664***
2002	1.0239	33.4757***
2003	1.1498	30.0726***
2004	1.3265	34.7499***
Apartment	0.0775	1.5454
Detached	0.2928	11.2430***
Semi Detached	-0.0130	-0.5148
Terrace/Mews	0.0185	0.6982
Central City	-0.0754	-1.9704**
South City	0.2321	9.7141***
South County Dublin	0.1633	6.3695***
Periphery	-0.1049	-3.1440***
Agent 1	0.0022	0.0559
Agent 2	0.0028	0.0768
Agent 3	0.0626	2.1126**
Agent 4	0.1802	3.9636***
Agent 5	0.1770	6.0782***
Agent 6	0.0760	3.0451***
Selectivity Variable	0.0508	1.1943
R ² adjusted	0.6892	

Notes: Table 6 reports the OLS hedonic model on guide prices. The sale mechanism dummy is based upon the mechanism the properties were initially advertised as being sold through. Therefore, any property advertised as being sold through auction but that eventually was sold through private negotiation is classified as an auction valuation. * indicates significance at 10%, ** at 5% and *** at 1%.

Table 7: OLS Model on Sale Prices

	Less than €500,000	More than €500,000
Constant	11.3910***	13.0266***
Sale Mechanism Dummy	0.1769	0.1908***
Bathrooms	0.0707***	0.0308**
Bedrooms	0.1356***	0.1108***
Parking	0.0192	0.0262
1998	0.1600***	0.0638
1999	0.3423***	0.1618**
2000	0.4359***	0.1752**
2001	0.5247***	0.2441***
2002	0.6891***	0.3261***
2003	0.7162***	0.4317***
2004	0.9958***	0.5837***
Apartment	0.1039*	-0.080
Detached	0.1066***	0.2288***
Semi Detached	-0.0076	-0.0300
Terrace/Mews	-0.0242	0.0380
Central City	-0.0057	-0.1742**
South City	0.1295***	0.1577***
South County Dublin	0.1281***	0.0531
Periphery	-0.1266***	-0.1081*
Agent 1	0.0192	-0.0276
Agent 2	0.0701**	-0.0435
Agent 3	0.0527*	0.0746
Agent 4	0.1469***	0.1106
Agent 5	0.1061***	0.1029**
Agent 6	0.0600***	0.0770*
Selectivity Variable	-0.0918	0.6586*
R ² adjusted	0.4677	0.2734

Notes: Table 7 reports the OLS hedonic model on sale prices with the sample split by value. The sale mechanism dummy is based upon properties that actually sold at auction or private treaty. Any property advertised as being sold through auction but eventually was transferred through private negotiation is classified as a private treaty sale. * indicates significance at 10%, ** at 5% and *** at 1%.

Table 8: OLS Model on Guide Prices

	Less than €500,000	More than €500,000
Constant	11.3883***	12.2576***
Sale Mechanism Dummy	-0.1018***	-0.1753***
Bathrooms	0.0819***	0.0552***
Bedrooms	0.1461***	0.1105***
Parking	0.0291*	0.0019
1998	0.1764***	0.1403*
1999	0.3641***	0.2408***
2000	0.4755***	0.2723***
2001	0.5677***	0.4438***
2002	0.7153***	0.5124***
2003	0.8196***	0.6306***
2004	0.9945***	0.7342***
Apartment	0.0783*	0.0997
Detached	0.1420***	0.2257***
Semi Detached	-0.0065	-0.0349
Terrace/Mews	-0.0205	0.0170
Central City	-0.0076	-0.1107
South City	0.1441***	0.2014***
South County Dublin	0.1204***	0.1245***
Periphery	-0.1187***	-0.0771
Agent 1	-0.0159	0.0210
Agent 2	0.0428	-0.0421
Agent 3	0.0357	0.1019**
Agent 4	0.1404***	0.1337**
Agent 5	0.1355***	0.1465***
Agent 6	0.0548**	0.1248***
Selectivity Variable	0.0398	0.1599*
R ² adjusted		

Notes: Table 8 reports the OLS hedonic model on guide prices with the sample split by value. The sale mechanism dummy is based upon the mechanism the properties were initially advertised as being sold through. Therefore, any property advertised as being sold through auction but that eventually was sold through private negotiation is classified as an auction valuation. * indicates significance at 10%, ** at 5% and *** at 1%.

Appendix:
Table A1: Private Treaty Hedonic Coefficients

	Guide Prices	Sale Prices
Constant	10.8872***	10.8683***
Bathrooms	0.4803***	0.4843***
Bedrooms	0.4623***	0.4547***
Parking	0.0720	0.1263
1998	1.3682***	1.4519***
1999	0.8955**	0.8269*
2000	0.6479	0.7442
2001	1.1475***	1.1496***
2002	1.3226***	1.3746***
2003	1.1751***	1.2466***
2004	1.4204***	1.4253***
Apartment	0.3263	0.3908
Detached	0.4137*	0.4663**
Semi Detached	0.2085	0.2370
Terrace/Mews	0.2421	0.2888
Central City	-0.0657	-0.1237
South City	-0.0257	-0.0757
South County Dublin	-0.0068	-0.0896
Periphery	-0.6384**	-0.7039***
Agent 1	0.0887	0.1233
Agent 2	-0.0133	0.0539
Agent 3	0.0488	0.1069
Agent 4	0.2027	0.2366
Agent 5	-0.0148	-0.0207
Agent 6	0.0451	0.0733
R ² adjusted	0.5566	0.5496

Notes: Table A1 reports the OLS hedonic model on guide and sale prices for the private treaty sample.
 * indicates significance at 10%, ** at 5% and *** at 1%.

Endnotes:

¹ Some recent contributions to this literature include: Ben-Shahar (2002), Ford et al. (2005), Glower et al. (1998), Herrin et al. (2004) and Knight (2002). Ong (2006) in his examination of post-auction private treaty transactions to some extent undertakes a similar analysis. The empirical analysis is based upon the bid differential between the last bid before the property was withdrawn and the final negotiated sale price.

² It should be noted that the paper does not attempt to model the actual premium, the difference between the sale and guide price. The authors are currently working on an extension of this current paper with a revised and expanded dataset to more comprehensively consider the key significant factors in the size of the premium observed.

³ A further strand of literature has examined the probability of a successful transaction. Studies to have examined this issue include: DeBoer et al. (1992), Maher (1989), Mayer (1995) and Ong et al. (2006).

⁴ Ashenfelter & Genesove (1992) is one of the few US studies to provide evidence of an auction premium. The authors examined the condominium market in New Jersey by comparing sale prices between identical units. The paper found evidence that those properties that were sold at auction sold on average for 13% more than those properties that were subsequently sold privately. These results do not necessarily imply that auctioned properties sell for more than those properties that were never placed before an auction since all of the private sales examined in this paper were initially offered at auction and then subsequently sold. These findings can also be viewed in the context of studies that suggest that prices decline as the auction process progresses (Lusht, 1994 and Ashenfelter, 1989). Bernhardt & Scoones (1994) attempt to explain this anomaly in the context that bidders with higher private valuations tend to dominate the initial run of auctions. As the auction continues to later lots, potential buyers with initially lower valuations start to enter and dominate the bidding process. Mayer (1998) finds little evidence of sequencing effects on sale prices. The author however notes that this may be due in part to the use of hedonic methods in previous studies. He notes that auctioneers frequently place more desirable properties at the beginning of the auction to maximize interest, and that a hedonic specification may not fully capture these qualities. Furthermore, the sample in the Mayer paper is relatively diverse in comparison to studies such as Ashenfelter & Genesove (1992).

⁵ See also papers such as Harris & Raviv (1981) and McAfee & McMillan (1988)

⁶ Ideally the empirical analysis would have controlled for differences in marketing time. As noted the convention with regard to auction sales is that a property is first advertised usually at least five weeks prior to the date of the auction. In contrast, the average marketing period for private treaty sales during the sample period is 19 days. Given the pace of market movements the observed premium may be due at least in part to general market conditions and to the use of what are effectively stale valuations in the empirical analysis of auctions. However, reliable information was not available at an individual property level. The difference in average marketing period of two weeks is though unlikely to alter the empirical results to a substantial extent.

⁷ While Lusht (1996) and Dotzour et al. (1998) are concerned with a similar form of potential bias regarding premium properties tending to be sold through auction, Mayer (1998) notes that the bias of selection is also present, although from an opposite perspective, in the United States.

⁸ For confidentiality reasons the brokers are not named and are instead referred to Agency 1 through 6.

⁹ The authors would like to thank one of the anonymous referee's for suggesting this approach.

¹⁰ The authors would like to thank one of the anonymous referee's for making this observation.