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Focal points and bargaining in housing markets ☆

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ABSTRACT

Are focal points important for determining the outcome of high-stakes negotiations? We investigate this question by examining the role that round numbers play as focal points in negotiations in the housing market. Using a large dataset on home transactions in the U.S., we document sharp spikes in the distribution of final negotiated house prices at round numbers, especially those divisible by $50,000. The patterns cannot be easily explained by simple stories of convenience rounding or by list prices. We conclude that round numbers can serve as focal points, even in settings with very high stakes.

1. Introduction

Nobel Prize winner Thomas Schelling introduced the concept of a focal point and described its role in coordination, bargaining and game theory in his seminal book *The Strategy of Conflict* (1960). A focal point is defined to be an outcome that is often chosen as the "resting place" of a negotiation because it is somehow natural or special.

In relating the concept of a focal point to explicit numerical bargaining Schelling states: "*In bargains that involve numerical magnitudes, for example, there seems to be a strong magnetism in mathematical simplicity. A trivial illustration is the tendency for the outcomes to be expressed in 'round numbers'; the salesman who works out the arithmetic for his 'rock-bottom' price on the automobile at $2,507.63 is fairly pleading to be relieved of $7.63.*" While the intuition that Schelling presents in his statement above is clear, there is surprisingly little empirical evidence of whether, and how round numbers serve as focal points in real-world bargaining situations.

Experimental literatures in both bargaining (see Roth, 1995) and negotiations (see Tsay and Bazerman, 2009) reveal that there is substantial room for social and cultural influences to affect bargaining outcomes. The experimental bargaining literature has revealed that perceptions of fairness appear to matter and that outcomes often center on 50/50 "fair splits" of the available rewards. While a desire for fairness appears to be part of the explanation for these patterns, many authors have shown that reliance on even splits also appears to have a strategic element related to the focal nature of these outcomes (Roth, 1985; Janssen, 2006; Andreoni and Bernheim, 2009). Janssen (2006), in particular, argues that there may be too much emphasis in the literature on fairness and that there should be more work to systematically understand the modal

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responses that form focal points in bargaining situations. We see this as a particularly relevant point for understanding real-world bargaining, since, in contrast to experimental settings, it is generally difficult to know the size of the total surplus in real-world negotiations. Schelling's arguments suggest the possibility that round numbers may serve the focal-point role when it is unclear what a fair split of the surplus should be.

In this paper we explore the role of round-numbered focal points for bargaining in a high-stakes environment by investigating negotiated prices in the U.S. housing market. We define a focal point very simply as a negotiated outcome that occurs more frequently than would be expected. The standard way to describe "expected" prices in the housing market has been Rosen's (1974) "hedonic model" which has guided empirical estimation of housing prices and implicit prices of housing characteristics for forty years. The model captures the notion that houses are heterogeneous goods that consist of a bundle of characteristics. When the housing market is sufficiently thick, then the housing price is determined by the combined value of the implicit or shadow prices of the individual characteristics of houses in the market that are revealed by trades between buyers and sellers. In this stylized setting, the bargaining that takes place between buyers and sellers in the real world is noticeably absent.[1] However, anyone who has purchased a house knows that thousands of dollars of "surplus" is bargained over, often with the aid of real estate agents. An important question is: does this bargaining process end up revealing the "true" value of a house given the assumptions of an efficient and thick market underlying the traditional hedonic model, or do house prices systematically reflect the influence of focal points in the negotiation process?[2]

To investigate the role of round-number focal points in the housing market, we acquired an extensive housing dataset of over 11 million housing transactions that took place between 1998 and 2009. The data were compiled from county assessor offices in 331 counties in 30 states and provide the final transaction price for each single-family house sold during this period. These counties represent approximately 45% of the population in the United States. We also acquired a small housing dataset for Chicago, Illinois, that provides not only the final transaction price, but also the price at which the houses were originally listed on the multiple listing service (MLS). These extensive data allow us to take Janssen's (2006) more "modal" approach in understanding bargaining and focal points seriously in this important market.

Using these housing data we tested the hypothesis that the focal nature of round numbers would lead to an increased mass of final negotiated prices at salient round numbers. We find strong confirmation for this hypothesis. Looking at simple histograms of the transaction-price distribution we find that there are spikes in the distribution at round numbers. The spikes are especially large at prices divisible by 50,000 and are also quite sizeable at those divisible by 25,000. For example, we find that there are approximately 21% more houses whose final sales price falls between $500,000 and $504,999 than would have been expected assuming a smooth distribution of housing values. Similarly, we find that there are six times more houses with a final sales price between $1,000,000 and $1,004,999 than there are houses with a final sales price between $1,005,000 and $1,009,999. We refine our histogram approach by looking at very small bins of housing transactions and show that the excess mass can be attributed to a large number of transactions right at the salient 50,000 and 25,000 round-number marks.

Given that there are transaction costs to negotiations, some degree of rounding in the process of negotiations is natural and efficient. We would not necessarily expect parties to negotiate over precise dollar amounts in increments of dollars or even perhaps hundreds of dollars. Indeed, convenience rounding likely explains the fact that the overwhelming majority of prices end on $1000 marks. However, the frequency of round-number pricing observed in the housing market cannot be fully explained with this sort of simple convenience-rounding story. In particular, we observe especially pronounced spikes at $25,000 and $50,000 marks, which cannot be explained by convenience rounding unless we believe that transaction costs are so large that negotiations occur in $50,000 increments even for houses worth $300,000 or $400,000. Instead, the patterns observed here strongly suggest that houses where negotiations might reasonably end in the neighborhood of a salient round number, are especially likely to end right on the round number. In fact, we document that most of the excess mass in the distribution of prices at $50,000 marks is drawn from within $10,000 of those prices. We also find some asymmetry in how salient, round-number prices, draw mass in the distribution of prices around them, contrary to a simple story of convenience rounding.

We argue that this excess mass is due to the round numbers serving as focal points in a bargaining situation. However, one might worry that institutional features of the housing market—and not focal points—may be the cause of this effect. For example, an alternative hypothesis is that our findings are a result of the listing prices that sellers set in this market. Using our smaller Chicago, IL dataset, we are able to explore this alternative hypothesis directly. We show that nearly all of the houses whose final sales price was right at a round number (e.g. $400,000) had a list price when the house went under contract of a larger number ($419,000, $429,000, $439,000, etc.). Homes with list prices of $419,000 were much more likely to be negotiated down to $400,000 than other final values (e.g. $395,000 or $405,000). Thus, the excess mass that we find at round numbers does not appear to be caused by list prices, but rather is driven by the negotiation process stopping at round numbers.

Our data run from 1998 to 2008 covering the housing boom in the U.S. and ending just as the housing market began to crash. When we analyze the patterns over time, we see that the extra mass spikes at $50k focal prices was present in each

[1] See Palmquist (2005) for more detail on the hedonic model applied to housing markets. Also, see Harding et al. (2003) for an attempt at introducing bargaining power into the hedonic model.

[2] See Kuminoff and Pope (2014) for a discussion of the hedonic model and the assumptions needed to identify willingness-to-pay using housing data.