

Pending Mortgage Reference Point and Valuation Judgment:

An Experimental Approach

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J. Andrew Hansz
Department of Finance and Real Estate
University of Texas, Arlington
Box 19449
Arlington, TX 76019
(817) 272-5843
hansz@uta.edu

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Abstract:

Expert real estate appraisers given identical valuation problems produced statistically different value estimates. The measured variable between experimental groups was an agency-client treatment operationalized as a pending mortgage scenario. This finding is consistent with the view of anchoring as a routinized response to agent-client concerns (Cho and Megbolugbe (1996) and Chinloy, Cho, and Megbolugbe (1997)). Experienced appraisers may develop heuristic behaviors which subconsciously sensitizes them to agency-client considerations. Although further research is warranted, this study provides initial experimental evidence of a causal link between agency-client concerns and valuation bias.

Key words: agency-client, moral hazard, pending mortgage, appraisal bias.

Introduction

Through years of experience and, perhaps, some confrontations with clients, real estate appraisers learn that arriving at a “low” valuation estimate can be a potential problem. A “low” valuation may have implications for a pending mortgage transaction and often prevent a loan application from being completed. Under these circumstances, the appraiser is often contacted by the mortgagor and/or the mortgagee to defend the valuation and/or asked to reconsider the submitted estimate. Implications of these client-agency concerns go beyond the valuation assignment at hand. A “low” valuation estimate may result in the appraiser receiving decreasing amounts of work from a client or removal from a lender’s approved list of appraisers.

Cho and Megbolugbe (1996) and Chinloy, Cho, and Megbolugbe (1997) write about the appraiser’s moral hazard. There are high costs for valuing a property below a pending sale price and the institutional setting of the industry puts a heavy burden of proof on “low” appraised values. Smolen and Hambleton (1997) report on the pervasiveness of client pressure. Roberts and Roberts (1991) pose the theory that client influences may represent the most common cause of appraisal judgment bias.

Survey findings have confirmed that coercive client pressure exists in the appraiser's task environment (Kinnard, Lenk, and Worzala, 1997) and client valuation feedback has a significant impact on the appraiser's role perception (Wolverton and Gallimore, 1999). Hansz and Diaz (2001) found that valuation transaction price feedback influences the valuation process. Feedback that the appraiser’s value estimate was “too low” appeared to be of greatest concern to the study groups. However, it is emphasized that the feedback treatment used in Hansz and Diaz (2001) was simply a transaction price

with no explicit agency-client implications. The authors suggested that agent-client concerns may over-sensitize appraisers to “low” transaction price feedback but further research is warranted.

Through experience and repeated dealings with clients, expert appraisers are sensitized to agency-client issues. Appraisers may develop subconscious production rules (heuristics) which are imbedded in the problem solving schema that places heavy weight on pending mortgage amounts. This subconscious process could lead to systematic error generally referred to as appraisal or valuation bias. A logical extension of the existing research is the question "do agency-client concerns influence valuation judgments?" This current study employs an experimental methodology to investigate a direct causal link between agency-client concerns and valuation bias.

Literature review and research hypothesis

In their ground-breaking work, Newell and Simon (1972) and Simon (1978) develop a theory of human information processing. Unfortunately, the human information processing system, or mind, is less than perfect with vital cognitive shortcomings. Perhaps one of the more important of these limitations is perhaps the capacity and processing speed limitations of short-term memory, where problem solving actually occurs. While long-term memory has abundant capacity, information storage and retrieval can be problematic. Because of these confines, humans develop suboptimal processing functions.

Tversky and Kahneman (1974) studied the coping strategies that humans employ to compensate for an imperfect processing system. Humans develop simplified

production rules, commonly called heuristics, to manage complex problems and information rich task environments. Heuristic development is a natural and important aspect of expertise development but these mental shortcuts may lead to systematic errors.

Experimental research in real estate valuation has revealed that expert appraisers do not follow the normative valuation model (see Diaz, 1990a and Diaz, Gallimore, and Levy, 2002) and use heuristic behaviors (for example, see Diaz and Hansz, 2001; Diaz and Wolverton, 1998; and Hansz and Diaz, 2001).¹ For example, a student conducting an appraisal for the first-time approaches the problem methodically, following the normative valuation model closely and examining a large volume of data. In contrast, an expert appraiser knows precisely what valuation techniques to employ and uses a screen strategy to select comparable data once the valuation problem is defined (Diaz, 1990b). The student's systematic approach is thorough, but not economically efficient. The expert's approach is efficient but could produce valuation biases. In addition, the student is naïve to the realities of the "real world" environment while the expert is sensitized to these business realities, including agency-client concerns.

One of the most robust heuristics identified by Tversky and Kahneman was anchoring and adjustment. Anchoring occurs when a reference point is relied upon in solving an ill-defined problem. The reference point is used as a starting point in making an estimate or judgment. The bias occurs because human problem solvers typically fail to make sufficient adjustments from the initial reference point.

A series of experiments were conducted to examine the use of reference points (anchoring and adjustment) by expert appraisers. Diaz (1997) and Diaz and Hansz (1997) found that appraisers anchor on an anonymous expert's valuation opinion in areas

of geographic uncertainty. Diaz and Hansz (2001) evaluated the relative importance of an expert opinion, a pending sales contract, and a pending sales agreement on a neighboring property as potential reference points. Diaz and Wolverton (1998) concluded that expert appraisers anchor on their own previous valuation judgments. Clayton, Geltner, and Hamilton (2001) also found empirical evidence of expert appraisers anchoring on their own previous valuation judgments in a large database of commercial appraisals.

Kinnard, Lenk, and Worzala (1997) and Wolverton and Gallimore (1999) surveyed appraisers to investigate the effects of client valuation feedback on the appraisal process. Kinnard et al. surveyed MAI (Member of the Appraisal Institute) designated appraisers to measure the amount of client pressure they perceived in their task environment. This survey explored the nature and frequency of client pressure. They developed a hypothetical scenario where a client (lender) was requesting an adjustment to a value estimate and the appraisers were asked to change the value. Forty-one percent of the subjects revised the value conclusions when requested to do so by the client. The appraisers' decisions to readjust were significantly and directly related to client size but not related to the size of the adjustment requested. These findings suggest that appraisers feel pressure to support a pending contract sale price as opposed to providing an unbiased opinion of market value.

Wolverton and Gallimore (1999) identified three possible forms of client feedback: environmental perception feedback, coercive feedback, and positive reinforcement of the normative appraisal methods. The survey samples were composed of Appraisal Institute designated appraisers and non-designated appraisers listed on a

national appraisal registry. The appraisers perceived that the *clients* (lenders) typically viewed the appraiser's role in the lending process as that of validating the pending sale price. Generally, appraisers did not perceive *their own* role as validating pending sale prices. However, appraisers receiving high levels of environmental perception and coercive feedback represent a sub-population who was more likely to perceive their role as loan validators and depart from normative training. Conversely, positive reinforcement feedback had a constructive impact on the appraiser's role perception and appraisers receiving high levels of positive reinforcement represent a sub-population who did not abandon their normative training. This study suggested that client feedback did influence appraisers' role perceptions and the type of feedback can discourage or reinforce normative behavior.

Levy and Schuck (1999) conducted in-depth interviews with five senior New Zealand Registered Valuers to investigate client influence on valuations. This study confirmed the anecdotal evidence that client pressure does exist in New Zealand. Furthermore, the authors suggested that the primary factors affecting the degree of client influence included the type of client, characteristics of the valuer and valuation firm, purpose of the valuation, and information endowments of clients and valuers.

Cho and Megbolugbe (1996) and Chinloy, Cho, and Megbolugbe (1997) were concerned with the appraiser's moral hazard and the asymmetric cost function appraisers face with higher costs for appraised values below pending sale prices as compared to appraised values equal to or above pending sale prices. Their theory was tested by examining 600,000 residential mortgages purchased by the secondary mortgage market. Interestingly, they found that 95% of the appraised values were greater than or equal to

the pending sale price although selection bias may also have influenced this sample of originated mortgages. Most loan applications with an appraised value less than the pending transaction price are rejected or renegotiated. Therefore, this data set is partially left-tail truncated.

Hansz and Diaz (2001) investigated the role of transaction price feedback in a series of experiments. Expert appraisers were asked to value a hypothetical property. After documenting their value, a treatment group was presented with current sales information on the property just appraised. The treatment groups received written information that they were either “too high” or “too low” on the first appraisal and were asked to proceed to a second, unrelated valuation case. A control group received no feedback on the first valuation and proceeded directly to the second, unrelated valuation case.

Appraisers who received the “too high” feedback in their first valuation judgment made statistically similar value estimates on the second, unrelated property as the no feedback control group. However, appraisers receiving feedback that they had been “too low” in their first valuation judgment made adjustments to their valuation strategy and produced significantly different value estimates on the second property, when compared with the control group.

Why the asymmetric response to the transaction price feedback? The authors propose that appraisers maybe over-sensitized to the “too low” feedback. In other words, an appraised value that was “too high” was not necessarily viewed as a problem by the appraisers. But feedback indicating that the initial valuation was “too low” apparently caused these appraisers to recalibrate their valuation processes.

This present study continues to extend the existing literature through an experimental examination of agency-client concerns on valuation judgment. Survey work (Kinnard, Lenk, and Worzala, 1997; Wolverton and Gallimore 1999) and in-depth interviews (Levy and Schuck, 1999) have established the pervasiveness of client pressure in the appraiser's task environment. Cho and Megbolugbe (1996) and Chinloy, Cho, and Megbolugbe (1997) found empirical evidence of an asymmetric cost function leading to systematic upward bias in appraised values. Hansz and Diaz (2001) provided initial evidence that transaction price feedback may influence valuation judgment; however, no agency-client implications were introduced into the experiment. This current study uses an explicit agency-client treatment to investigate a direct causal relationship between agency-client concerns and valuation judgment. The research hypothesis for this study is:

Agency-client concerns (operationalized as a pending mortgage scenario) will bias the valuation process. Expert appraisers receiving the agency-client treatment will systematically produce higher valuations than the control group not receiving the agency-client treatment.

Methods

The methodology employed to investigate the research hypothesis was similar to that used in Diaz and Hansz (2001), a one-factor fixed effects experiment. The experimental factor (independent variable) was an agency-client treatment. Participants were given identical valuation tasks. The exception for research purposes was that a treatment group was given additional information regarding a pending mortgage loan scenario. The following section provides an overview of the measurement instrument, treatment, and sampling procedures.

Measurement instrument. The valuation task was to appraise an unimproved parcel of vacant industrial land. Vacant land was selected as the subject property because only one of the three traditional valuation approaches, the sales comparison approach, is typically used to value unimproved land. This simplified the valuation case by eliminating the need for cost and income data. This case to be evaluated is similar to the valuation cases used in Hansz and Diaz (2001).

The valuation case was thirteen pages and included maps and photographs. An introductory problem statement explained that the subject property was an unimproved industrial parcel located in Pennsylvania. The appraisers were instructed to read the case carefully and determine the market value of the land.

Information on five comparable sales was provided for basis of comparison to the subject property. Comparable sales ranged from \$70,022 to \$100,435 on a price per acre basis (mean price of \$85,029 per acre). Although the information in the case was based on an actual market, the comparable sale data had been manipulated to eliminate any obvious trends or adjustments. No cues would lead the appraiser to either the high or low ends of the comparable sale price range. This valuation problem was intentionally ill-defined so the appraisers would have to use judgment.

Treatment. A treatment was needed to simulate client pressure in the experimental setting. It was necessary for the treatment to imply the need of achieving a certain appraised value for lending purposes. Through experience, appraisers are sensitized to the “costs” associated with valuing a property below a required pending mortgage amount. In an experimental setting, the participant may not be concerned about “real life” economic implications. However, if appraisers developed routinized responses

to agency-client concerns, it is anticipated that the experimental treatment will influence valuation judgment.

Two different treatment statements were randomly assigned to treatment subgroups A and B. The treatment for subgroup A was as follows:

“The intended use of this appraisal is for lending purposes (mortgage loan). The lender has emphasized that the borrower (owner) is requesting \$262,000 mortgage loan and the lender’s underwriting criteria will not allow a loan-to-value ratio of greater than 70% for vacant industrial land (strictly followed).”

This treatment simply implied a value of approximately \$374,000 or \$93,500 per acre was required to achieve a loan-to-value ratio of 70% ($\$262,000 / \$374,000$). This implied value was within a reasonable valuation range considering the \$70,000 to \$100,000 per acre range in the comparable sales data but was significantly higher than the \$85,000 per acre average.

Kinnard, Lenk, and Worzala (1997) noted that the amount of revenue and the percent of the appraiser’s total revenue provided by a client may be important factors in considering the strength of the client influencing a valuation judgment. A second treatment, similar to the first, was developed with additional client revenue and size implications. The treatment for subgroup B was as follows:

“The large regional lender (client) who has ordered this valuation has historically provided 30% to 40% of your firm’s total business income over the past seven years. However, during the past 12-months, this client has dramatically reduced business to your firm (you estimate the client now represents less than 10% of your revenue) and this is the first assignment from this client in over three months. The client has emphasized that the borrower (owner) is requesting to borrow \$262,000 mortgage loan and the lender’s underwriting criteria will not allow a loan-to-value ratio of greater than 70% for vacant industrial land (strictly followed).”

It was anticipated that the treatments for both subgroups would influence valuation judgments. However, the additional client implications of treatment for subgroup B may generate even greater motivation to anchor on the pending mortgage reference point.

Sampling procedures. A sample of expert appraisers was taken from two advanced level appraisal review classes held in Dallas, Texas in January and August 2001. This particular appraisal review class was populated by appraisers pursuing the Appraisal Institute's MAI designation and preparing to take the general comprehensive examination. Typically, these appraisers had completed all MAI educational requirements, passed several formal appraisal work experience peer reviews, and completed a commercial property demonstration appraisal report. The comprehensive examination is the final requirement before achieving the MAI designation and the purpose of this seminar was to prepare for this rigorous examination. Participants in this seminar were generally highly motivated, well educated, and experienced appraisers.

The experiment began with a cover letter and a one-page questionnaire concerning experience/education (number of years, types of valuation assignments, designations and certifications, etc.) and familiarity with the Pennsylvania property market. On June 2, 2002, 100 cases with cover letters, questionnaires, and return postage, were mailed to a random sample. A reminder postcard was mailed in late June and 25 responses returned by July 15, 2002. The next section provides an overview of the responding sample.

Sample characteristics

Table 1 contains an overview of the sample profile including demographic, employment, and education characteristics. Most participants were employed as appraisers full-time. Two respondents indicated significant 'other' employment and described their positions as supervisory in nature and a review appraiser.

(PLACE TABLE 1 APPROXIMATELY HERE)

The respondents primarily worked in the commercial (as opposed to residential) real estate markets (98%) with mortgage lenders (Commercial Banks, Savings & Loans, etc.) the most typical clients (49%). The 'other' category (15%) included private investors. The nature of their assignments were typically 'valuations' (76%) followed by the 'other' category (17%), which was primarily 'due diligence' work. The average number years of real estate experience was 16 years with 13 years of appraisal experience.

Quan and Quigley (1991) and Geltner (1993) find that geographic unfamiliarity increases problem uncertainty and the likelihood of reference point influence. The appraisers indicated that they covered primarily a local and regional geographic area. Two questions were posed to screen for geographic familiarity with Pennsylvania land values. Two appraisers stated they work in Pennsylvania and had knowledge of land values. These respondents were eliminated from the study. Remaining participants had the same case data with no additional market specific knowledge.

Most respondents held a Bachelor or Master's degree as the highest level of formal education. Over one-third of all respondents had achieved the Appraisal Institute's MAI designation in the time period between attending the review course and

the distribution of this experiment. No one held the SRA designation. Approximately half of the respondents indicated that they held appraisal state certifications. This response was suspect as many participants wrote, for example, just “MAI” although most MAI appraisers are also certified in at least one state. It was perhaps easier for the respondents to write the highest appraisal credential rather than listing all certifications and designations.

Twenty-three expert appraisers qualified to participate in this study. In summary, the respondents had on average over a decade of appraisal experience, were well educated with most holding a Bachelor or Master’s degree, and over one-third had achieved the MAI designation. Their most typical assignment was a valuation analysis of a commercial property and the most typical client was a mortgage lender. This sample was comprised of experienced appraisers with no significant differences between control and treatment groups in terms of education levels and experience.

Results

The value estimates are displayed in Table 2. The eleven responses from the control group ranged from \$70,000 to \$100,000 per acre with a mean of \$87,423 per acre. The twelve treatment group responses ranged from \$85,000 to \$110,000 per acre with a mean of \$93,792 per acre. The difference between the control group mean and the treatment group mean is \$6,368.30. The following section will examine whether this difference is statistically significant.

(PLACE TABLE 2 APPROXIMATELY HERE)

Statistical examination of the research hypothesis. All test statistics were derived from *SPSS for MS Windows Release 10.1* software. Table 3 is a summary of the statistical analysis. The statistical tests used were the parametric Student's t-test and the non-parametric analogs to Student's t-test, the Mann-Whitney and Wilcoxon tests. The parametric t-test requires that all groups come from normal populations with the same variance. The Levene Test was employed to test for equality of variances between groups. The null hypothesis of equal group variances was not rejected.

The Mann-Whitney and Wilcoxon tests were used as checks on the parametric t-test. The non-parametric Mann-Whitney and Wilcoxon tests make no assumptions regarding the characteristics of the sample population's distribution. The Mann-Whitney U test statistic and the Wilcoxon W test statistic were converted into Z-scores to calculate and interpret the appropriate significance level. Also, significance levels are reported as 1-tailed tests because the test hypotheses specify the direction of the expected deviation.

(PLACE TABLE 3 APPROXIMATELY HERE)

The research hypothesis results in the following test hypotheses:

$$H_0: C - T \geq 0; \quad H_a: C - T < 0;$$

Examining the parametric t-test first, the null hypothesis ($C - T \geq 0$) was rejected at the 5% confidence level with a significance level of 3.2%. For the non-parametric test, the null hypothesis was rejected at the 10% confidence level with a significance level of 6.7%.

Qualitative examination of responses - control group versus treatment group.

The treatment implied a required value estimate of \$93,500 per acre or greater to fulfill

lending underwriting requirements. The control group had two of 11 observations (or 18% of all control respondents) greater than \$93,500 per acre. The treatment group (both subgroups A and B) had six of 12 observations (or 50% of all treatment respondents) greater than \$93,500 per acre. Additionally, several treatment group respondents reporting appraised value below \$93,500 per acre wrote comments indicating concern for the pending loan. Others highlighted loan-to-value ratios very close to the required 70% and one respondent wrote that the loan should be approved despite their own \$90,000 per acre value estimate. It was clear that the pending mortgage reference point was carefully considered, even by the respondents with appraised values below \$93,500 per acre.

Qualitative examination of responses - treatment subgroups A and B. Treatment subgroup A had five responses with an average appraised value of \$93,200 per acre. Treatment subgroup B, with the additional client size and revenue implications, had seven responses with an average appraised value of \$94,214 per acre. Although interesting to note, this difference was certainly not statistically different. Also, the two highest appraised values (\$110,000 and \$102,500 per acre) were found in treatment subgroup B. These observations were particularly interesting because the comparable sales data ranged in value from \$70,000 to \$100,000 per acre. Perhaps the additional client implications provided motivation to push the upper limit beyond the highest per acre transaction price.

Conclusion

Expert appraisers given identical valuation problems produced statistically different valuation estimates. The only difference among the experimental groups was an agency-client treatment operationalized as a pending mortgage scenario.

These findings are consistent with the view of anchoring as a routinized response to agency-client concerns (see Cho and Megbolugbe, (1996) and Chinloy, Cho, and Megbolugbe, (1997)). Expert appraisers may develop a heuristic which subconsciously sensitizes them to agency-client considerations. Appraisers with the pending mortgage information did trend toward the pending mortgage reference point and the higher end of the valuation range. Although further research is certainly warranted, this study provides initial experimental evidence of a direct causal relationship between agency-client concerns and valuation bias.

How robust are these results? Appropriately, no absolute claims of external validity of results are warranted from this single study. Additionally, participants were purely volunteers with no economic incentives or consequences. However, it is hypothesized that economic incentives may strengthen the anchoring tendency and studies are currently underway that introduce compensation into the experimental setting.

ENDNOTE

¹See Appraisal Institute (2001) page 51 for a description of the normative valuation model. Diaz, Gallimore, and Levy (2002) compare the normative valuation model to actual appraisal behavior. This research is reviewed in Diaz (2002).

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Table 1: Sample Profile – Overview

Group:	Control	Treat.	Total
Appraisers	11	12	23
Currently employed as an appraiser?	91%	96%	98%
Percentage work commercial?	99%	96%	98%
<u>Clients:</u>			
Mortgages Lenders	53%	45%	49%
Insurance Companies & Pension Funds	2%	1%	1%
Tax Appeal/Condemnation/Government	22%	27%	25%
Accountants or Attorneys	9%	11%	10%
Other	15%	16%	15%
<u>What is the nature of your assignments?</u>			
Valuations	80%	73%	76%
Feasibility Studies	2%	3%	3%
Consulting Work	2%	8%	5%
Other	16%	17%	17%
How many years of RE experience? (in years)	16	15	16
How many years of appraisal experience? (yrs.)	12	14	13
<u>What geographic area do you cover?</u>			
Local	18%	50%	35%
Regional	73%	42%	57%
National	9%	8%	9%
Any recent assignments in PA? (yes)	0%	0%	0%
Familiar with industrial land values in NE? (yes)	0%	0%	0%
<u>Highest level of formal education:</u>			
High School/Some College	0%	8%	4%
Bachelor's Degree	45%	58%	52%
Graduate Degree	55%	33%	43%
<u>Appraisal designations and certification:</u>			
MAI	36%	33%	35%
SRA	0%	0%	0%
State Certification	55%	50%	52%

Note: Total includes both the control and treatment groups. Some question responses may not total to 100% in all cases due to rounding and incomplete responses.

Table 2: Value Estimates

Group:	Control ("C")	Treatment ("T")
	\$100,000	\$100,000a
	\$95,000	\$95,000a
	\$90,000	\$95,000a
	\$90,000	\$90,000a
	\$90,000	\$86,000a
	\$90,000	\$110,000b
	\$90,000	\$102,500b
	\$86,657	\$95,000b
	\$80,000	\$90,000b
	\$80,000	\$90,000b
	\$70,000	\$87,000b
	-	\$85,000b
Number of Responses	11	12
Mean	\$87,423	\$93,792
Standard Deviation	\$8,143	\$7,439
Maximum	\$100,000	\$110,000
Minimum	\$70,000	\$85,000

Table 3: Summary of Statistical Test Results – Parametric and Non-parametric

Comparison	C vs. T
Levene's Test:	
F statistic	.012
Significance level	.915
Parametric t-test:	
T statistic	-1.960
Sig. Level (1-tailed)	.0315
Non-parametric tests:	
Mann-Whitney U	41.5
Wilcoxon W	107.5
Z	-1.545
Asymptotic Sig. (1-tailed)	.0610
Exact Sig. (1-tailed)	.0670