

Mass Appraisal — Hedonic Modeling

Last month, we featured a story on the rapidly evolving Chinese Drywall litigation. I implicitly promised that this month we'd move back to real estate investment and economics issues. However, the current issue of The Appraisal Journal featured a major article by our good friend, Dr. Peter Colwell (and his co-authors John Heller and Dr. Joseph Trefzger) titled "Expert Testimony: Regression Analysis and Other Systematic Methodologies". For many years, Greenfield has used statistically-based mass appraisal models in our work, and are frequently called upon to explain to the Courts how mass appraisal can be used efficiently and effectively in class actions and other mass torts. With that in mind, it is useful and timely to review and expand on this important AJ paper.

What is mass appraisal?

The Uniform Standards of Professional Appraisal Practice (USPAP) defines mass appraisal as "...the process of valuing a universe of properties as of a given date using standard methodology, employing common data, and allowing for statistical testing." Tax assessors have always performed mass appraisal, even though in earlier days they employed fairly methodical and inefficient practices to compile a mass data base of taxable property values in a jurisdiction. When a highway department or other eminent domain authority wants to put in a new road or widen an existing one, they generally employ some of the tools and techniques of mass appraisal in order to fairly and evenly value all of the various properties which will need to be "taken" for the new project.

With the advent of computers, most mass appraisal exercises are now properly referred to as "computer aided mass appraisal", or CAM for short, although the use of computers has become so common that the simple term "mass appraisal" implies some sort of computer aided exercise. The most frequent method used is some form of multiple regression, typically called the "hedonic regression model". "Hedonic" refers to enjoyment or utility, and it is a method of valuing those components of each property for which the market would give value. While that seems complicated at first blush, in practice it is actually fairly simple. Appraisers recognize that the value of a property — say a house — can be measured by the value of its various components. A home in a given neighborhood can usually be valued knowing just a few things, such as the square footage of the house, the size of the lot, the number of bathrooms, the condition/quality of the structure, and the home's age. Some amenities such as fireplaces and garages frequently contribute value, but this generally a localized issue. (For example, a fireplace contributes value in Connecticut, but not in Phoenix.) Once you know how much value the market places on these items, the total equals the value of the whole property. Note that in such an analysis, the appraiser recognizes that idiosyncratic items — unique to the specific property — usually aren't valued very much by the market or can be accounted for under the condition/quality category.

If an appraiser wants to value one home, he or she will gather recent sales of comparable homes, usually in the same or similar neighborhood, and use data from those sales to value the subject property. If the appraiser wants to value two homes in the same neighborhood, both of which are reasonably similar to one another, he or she will probably use the same "comps" to value both houses. As the number of houses being appraised grows, the commonality of the data and methods starts to resemble a mass appraisal model. As some juncture — particularly when the number of subject properties reaches a statistically robust size — then the appraiser has *de facto* performed a mass appraisal.

We would note that there are other ways than hedonic models for tackling a mass appraisal problem, particularly in litigation. For example, the question to be researched may involve the trend of house prices over a period of time or before-and-after a certain event. In such cases, a repeat sales methodology may be one method for the appraiser to develop a pricing index over time. If an adequate number of sales are sampled, then the index will have good statistical properties and meet the same standards as a hedonic model.

(Continued on page 2)

USPAP has a somewhat different set of standards for a mass appraisal as opposed to a single appraisal, although the scope of work requirements are essentially identical and the fundamental outcomes are the same. In a mass appraisal, individual property values are reported, but the underlying methodology can now be evaluated statistically for all of the important characteristics (unbiasedness, consistency, minimal error rate, etc.). As the number of subject properties becomes large, the efficiency of mass appraisal — both in cost and time — becomes overwhelming. As such, courts faced with large mass torts are generally well advised to find ways to approach these with mass appraisal rather than individual appraisals.

What does the Appraisal Journal Article say about all of this?

The point-of-departure for the Colwell and his co-authors was a recent 7th Circuit Court of Appeals ruling in an eminent domain matter, *Guardian Pipeline LLC v. 950.80 Acres of Land, et. al.* (525 F.3d 554). In the original case, the “taking” authority (a Commission appointed by the court) used a hedonic mass appraisal model to determine an aggregate “taking” value of \$2.5 million, while the individual land owners used individual appraisals and arrived at various values totaling nearly \$20 million. The lower court affirmed Guardian’s value, and the landowners appealed, principally on an issue of conflict of interest by the Commission chair. The Appeal court affirmed the District court’s ruling, in an opinion written by Chief Judge Frank Easterbrook.

As Colwell, et. al., note, had Judge Easterbrook stopped there, it would have been a fairly pedestrian ruling. However, Judge Easterbrook went on with his opinion, *in dicta*, and leveled criticism at the effort of using individual property appraisal methods. Instead, Judge Easterbrook embraced the use of a multiple regression analysis as a faster, more accurate alternative. The Colwell article opines that his ruling “...is so sensible, and long overdue, that it seems likely, eventually, to assume an important role in adjudicating such cases. Appraiser, in turn, will need to become proficient in multiple regression methodology, and, when testifying as expert witnesses in cases involving easement takings or other adjudicated valuation issues, be able to explain their analysis and data in a manner that is admissible as evidence.”

What is the standard for admissibility as evidence?

At Greenfield, and in many of our writings, we’ve long pondered the paradox posed to appraisers by the *Daubert* standard. In short, *Daubert* provides a non-exclusive list of factors for Courts to consider when determining if testimony is both relevant and reliable:

1. Can the expert’s theory or technique be tested, and has it been tested?
2. Is there a known error rate
3. Is there a set of standards to control error? Has the theory or technique been peer-reviewed?
4. Has the theory or technique been subject to peer review?
5. What is the degree of acceptance of the theory or technique within the relevant scientific community?

Clearly, hedonic mass appraisal and other statistically-based techniques which are well-established in the academic and scholarly literature meet these tests. However, Courts have generally been inclined to ignore the reality that individual appraisal techniques may fall short, particularly in the first three of these tests. In cases where only one or a few properties are in question, then an individual appraisal will, in fact, be more efficient. Further, the broad acceptance of individual appraisal techniques gives the Court some comfort, and has generally satisfied the *Frye* standards for many years.

However, in cases where a large number of properties are in question, such as in a large eminent domain taking, a large-area contamination problem, or some other mass real estate tort, it is hard to see how the individual appraisal techniques could be found superior. Judge Easterbrook seems to see it that way, as well.

(Continued on page 3)

(Continued from page 2)

As noted, USPAP provides broad guidance for appraisers on the use of Mass Appraisal techniques, although these standards do not specify hedonic models (as opposed to other models) or specify particular testing methods. Not unexpectedly, the International Association of Assessing Officials (IAAO) proffers an excellent library of both standards and methods which are useful in such matters. Their text, Mass Appraisal, is a must-read for any appraiser who considers using these methods.

A more specific set of standards for litigation come to us from "Reference Guide on Multiple Regression" by Daniel L. Rubinfeld, which appears as a chapter in Reference Manual on Scientific Evidence, 2nd (Washington, DC: Federal Judicial Center, 2000). Rubinfeld sets a fairly high bar for admitting an expert's qualifications, and this may prove difficult for most practicing appraisers.

"...any individual with substantial training in and experience with multiple regression and other statistical methods may be qualified as an expert. A doctoral degree in a discipline that teaches theoretical or applied statistics, such as economics, history, and psychology, usually signifies to other scientists that the proposed expert meets this preliminary test of the qualification process."

While there are quite a few appraisers with doctoral degrees, and many who testify regularly in court cases, the vast majority of practicing appraisers do not have the sort of training or experience outlined by Rubinfeld, and there is little in the typical appraiser's professional education curriculum to make up the difference.

Notably, Rubinfeld flips this coin over to look at the other side: "...[A] proposed expert whose only statistical tool is regression analysis may not be able to judge when a statistical analysis should be based on an approach other than regression analysis." This is highly consistent with our experience here at Greenfield. We've noted that proffered "experts" in real estate valuation cases who do not also have training and expertise in appraisal are usually not very credible.

Where does this lead us?

One might be tempted to write this off as simply one AJ article based on one judge's opinion. That would be extraordinarily short-sighted. Choi, in his article "Who would win a tournament of judges?", notes that Judge Frank Easterbrook is the second most highly cited judge in America. University of Chicago Law School Dean Saul Levmore has stated that "Easterbrook is an important influence on legal education through his judicial opinions. Course after law school course has changed for the better as Judge Easterbrook's opinions have made their way into the curriculum. So long as he decides cases, and decides them in a way that cuts to the heart of an issue with such skill and pressure, no area of law can be dull." Easterbrook's 1991 book with Daniel Fischel, The Economic Structure of Corporate Law, is frequently used as a text in Ph.D.-level Finance programs, and a 2004 poll by Legal Affairs magazine named Easterbrook one of the top twenty legal thinkers in the U.S.

Peter Colwell is the retired Chair Professor of Real Estate at University of Illinois-Urbana Champaign, and currently on the Emeritus faculty there in Finance. It is safe to say he is one of the most prolific writers in real estate valuation, and one of the most frequently cited authorities. As such, one would expect Easterbrook's opinion and Colwell's article to rapidly impact the conduct of appraisals in large class-actions.

Greenfield has produced several published articles on real estate class actions, as well as a 2007 White Paper summarizing our work and research methods. We plan to produce an updated white paper on the topic before the end of 2009. For copies of our current White Paper, or a copy of the new 2009 paper when it's published, please contact us at info@greenfieldadvisors.com.

Mueller's Market Cycle Monitor

We frequently cite Dr. Glenn Mueller and his Market Cycle Monitor, produced quarterly by Dividend Capital Research. He tracks 50 different MSA's and five major property types (office, industrial, apartments, retail, and hotel) across a spectrum which categorizes the market as either in "recovery", "expansion", "hypersupply", or "recession".

As you might guess, nearly everything is in recession, with the interesting exception of senior housing, which is in increasingly short supply and thus, in Dr. Mueller's opinion, in the "recovery" phase at present. (We happen to concur with him.) He finds that most office markets are in recession. Two markets (Honolulu and San Antonio) are not necessarily in recession yet according to his taxonomy, but seem to be headed that way. However, Houston and Denver appear to be leading the pack in recovery, and thirteen other markets appear to be on the brink of recovery. The industrial market has seen worse, with all but three geographic markets in recession. He finds that Columbus, Detroit, and Pittsburgh may be on the brink of some industrial recovery.

In the apartment market, only Milwaukee is showing some signs of recovery. Nowhere are retail or hotels showing any signs of recovery yet. As grim as this sounds, Dr. Mueller's analysis is based on supply and demand, and specifically measuring occupancy, absorption, and new supply. At the peak of the recent cycle, most markets were flooded with new construction, much of that fueled by easy money. It will simply take a while for these properties to be absorbed. In the meantime, new development is limited to those few markets and market sectors where occupancy is catching up with supply.

For your own copy of Dr. Mueller's report, visit Dividend Capital at:

<http://www.dividendcapital.com/why-real-estate/market-cycle-reports/index.html>

Some News from Greenfield

We have several speaking engagements coming up in the near future — Dr. Max Kummerow and I will appear at the Northwest Environmental Business Council's upcoming luncheon program, "Value Drivers for Brownfield Sites", here in Seattle on September 2. For more information, visit their web site, www.nebc.org.

In addition, that same group is holding a one-day conference in October in Tacoma, Washington, titled "Brownfields Redevelopment: Building Sustainable Communities". Dr. Kummerow will speak on the topic of "Opportunity Identification".

Greenfield can provide speakers and programs on a variety of real estate, finance, and investment topics, as well as our regular economic briefings on the state of the real estate market. For more information, please contact our Client Services Manager, John Casker, at jcasker@greenfieldadvisors.com, or phone him at 206-623-2935.

Finally, we want to announce two staff changes here at Greenfield. First, we welcome back a semi-newcomer, Brian Fulbright, who just finished his Masters in Real Estate at Denver University, and re-joins our analysis staff after brief absence. Also, we wish a *bon voyage* to Tony Pai, who is headed out on a leave-of-absence to do graduate work at Reading University in England. Best wishes to both of them!

John A. Kilpatrick, Ph.D., MRICS
Greenfield Advisors LLC