

Decision Making in Valuation - a Comparison between Court Judgments and Valuation Education/Research

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Summary

This paper analyzes the use of quantitative methods in the court decision making process and the use of subjective probabilities to analyze valuation methods. It is argued that academics/researchers in promoting fundamental quantitative methods are drawing further apart from court decisions. Attempts by legal analysts to quantify the decision making process are examined and it is suggested that the use of "subjective probabilities" better emulates "practical valuation" and decision making by the actors in the normative "willing buyer willing seller" theory. Therefore, the valuation educator/researcher can benefit from the court's method decision making and that it is a superior valuation paradigm to that of the fundamental quantitative analysts.

Introduction

At this conference last year I argued that there is an unfortunate trend in valuation education/research of placing the valuer/researcher at the centre of the valuation "scheme of things". I call this an "educational centrality" approach which unfortunately, is not how the valuation system works. Further, I argued that General Systems Theory (GST) is a good way to analyze the valuation system as it does put the actors within the system into perspective or context. My analysis using GST shows that the most important environments in the valuation system are:

1. The client
2. The law
3. Politics.

The educationalist/researcher comes in at a very low level under this analysis and is not important at all in the general valuation system. Following that analysis I now intend to look at the law or legal environment that has such a powerful effect on valuation principles and practice. How do judges decide value and can their methods be reconciled with the methods being promoted in academia such as quantitative techniques? Can court judgments be equated with such methods or will there always be a gap(which appears to be increasing) between valuation education/research and the valuation court judgments?

I will examine the use of quantitative methods in analyzing court judgments because if it is accepted that the legal environment is one of the most important environments in the valuation system (if for no other reason it is the final arbiter of value) it must be worthwhile to examine the judgmental process as it could indicate a useful method or process to determine market value.

The role of the courts in Australian valuation is most important and cannot be overemphasized as the profession has largely determined its principles and practice on court decisions. At the same time education and research has generally, been critical of the role of the courts usually on the basis that they will not accept "new" methods and thus hamper the development and use of such methods. In my view such an argument is naive, reflecting a tendency to ignore the importance of the legal environment in the valuation system.

The law is well aware of quantitative methods and has applied them in a number of decisions. The most notable being TNT v Brooks [1979] 23 ALR 345 in which Murphy J, always at the vanguard of judicial thinking, used probabilities to arrive at a judgment on a truck driver's fault in a case where there were no witnesses and very little direct or concrete evidence. Judicial researchers have tried to analyze legal judgments according to quantitative methods and I will give a brief overview of this complex subject.

The Use of Quantitative Methods in Court Judgments

Cohen argued that "probability" as used in legal judgments does not conform with the use of statistics in non-judicial statistical research but rather, is a different paradigm (Cohen, 1977). Instead he put forward his own "inductive probabilities" method which overcame some of the shortcomings of "classical probability" (ie according to Pascal) when used to determine court decisions. However, Kaye in response, argues that modern quantitative methods can be adapted and used in court judgments (Kaye, 1981). What makes Kaye's response most useful in valuation theory is his inclusion of subjective interpretations in his paradigm.

To illustrate the application of probabilities to judicial decision making consider the following example:

Example: Suppose there are 12 sales used to determine the value of a cottage. Expert evidence shows that 7 sales support the value determined by the plaintiff and 5 sales support the value by the defendant.

In such a case the courts would be reluctant (and rightly so) to use the fact that because the majority of sales favour the plaintiff's valuation, judgment would be decided on that basis alone. Sales in this context are known as "background statistics" and the problem can be overcome by recognizing that better statistics are required and the court process should be used to force out the better statistics. For example, evidence that the 7 sales depended upon by the plaintiff were not as comparable as the 5 sales used by the defendant.

Cohen's solution to this problem is to use qualified subjective probabilities whereas Kaye would distinguish between the "subjective" and "objective" interpretation of statistics. In the above example, Kaye would not accept that the probability of the plaintiff's valuation being correct is 0.70. Rather, the expert valuers giving evidence should be forced to produce more and better evidence; "...more probative evidence with little effort". If the expert witness fails to produce such evidence (the existence of which can be easily determined under expert cross examination) it is because it does not support the value of that party and would reduce the subjective probability of their value being correct.

Bayes' Theorem

One way to incorporate an inference after the non production of the relevant evidence is by the use of Bayes' theorem. The advantage of the Bayesian probability concept is that it rests on a subjective approach that is similar to "practical valuation" methods. It is based on the personal judgment of the decision maker concerning the probability of the valuation part of being correct and is particularly useful for determining the value of development sites. It acknowledges the experience of the valuer in determining risk of new developments or building ideas. That is, the "art" or experience part of valuation is recognised. The general Bayes' formula in the context of the valuation of development land is as follows:

$$R/G = (ND * PF) / (SND * PS)$$

Where:

R/G = risk/gain ratio
ND = potential losses from new design
PF = probability of failure
SND = potential savings by using new design
PS = probability of success

Subjective Interpretation

Fundamental quantitative analysts may be critical of the subjective element in-court decision making. However, this ignores the fact that the valuation system as analyzed under General Systems Theory, includes a great deal of subjectivism, the quality of which depends on the ability and experience of the valuer. For example, a most important variable in the value of a residential cottage is the architecture or "style". This is a transient variable which changes at the whim of the fickle public and therefore, its assessment must be subjective. Traditional quantitative laws do not adapt well to unique, non repeatable events such as the determination of market value. Therefore, the subjective view would appear to be most suitable in this context.

The willing buyers and sellers for heuristic purposes can be visualised as making personal estimates of the probability of the correctness of parts of the valuation. For example, "if I buy this block of land, there is a high probability that the city will expand in this direction and there are few competing sites and therefore, there is a high probability that I will enjoy high capital gains from this investment". Such analysis is not quantified but rather, is couched in general and subjective terms. The judge in the court of law and commonly, the practising valuer thinks along similar lines when considering valuation evidence.

Cohen criticizes the use of subjective probabilities because they are determined under betting odds concepts. He argues that subjective probability cannot apply because there is no independent procedure for resolving hypothetical bets about facts disputed by the litigants and because the odds that the judge would accept depend on the magnitude of the bet. However, it can be argued that decision theory reveals that as long as a person acts in accordance with his preferences among alternative risky outcomes and that as long as these preferences have certain plausible properties, that person can be said to be predicating his choices according to subjective but mathematical probabilities (Kaye, 1981, p642).

A basic argument against subjectivism is that it is "subjective". Such a view is shared by a number of economists and educators. For example, when analyzing market value they cannot accept the fact that there is subjective consensus in the market place however, those of us who have "day in day out", analyzed market transactions are continually surprised at just how much consensus there is. The old normative view that every parcel of land has a certain market value trying to escape out at any point in time is most real to the practising valuer. It is in this respect that the acceptance of subjective probabilities by the courts mirrors the "real world" more than does fundamental quantitative analysis.

With subjective probability there is no logical inconsistency in valuer A saying that "for me, the probability of a rival shopping centre being established to compete against the subject property is 0.70" and for valuer B on the opposing side saying that for him it is 0.30. It is up to the court process to prove to the satisfaction of the judge (or jury) which expert is correct. This can be achieved through expert cross examination and the non production of important information would be most relevant in this context.

The Use of Quantitative Methods - The Albany Case

The well known case; *Albany v Commonwealth* (1976) 12 ALR 201 illustrates the problem that courts have with the use of quantitative methods and in this case; DCF. The case underlines particularly well how the use of the normative "willing buyer willing seller" theory allows the use of sale evidence which may be discarded by fundamental quantitative analysts. Normative theories such as the willing buyer willing seller theory prescribe formally an ideal behaviour or behaviour that is consistent with the basic axioms of the theory.

The context of the Albany case is important. The area of the subject land was large, about 1 850 ha. The purpose of the acquisition was "the planned development and control of the City of Darwin and its adjacent areas" (p203). The plaintiff's DCF assumed that the land could be subdivided into 6*8.5 ha lots plus 11 930 lots of residential land together with sites for shopping centres, schools and open space. Therefore, by any account it was a large and problematical development. The plaintiffs valued the land at \$8 477 000 using a discount rate of 25%. Jacobs J comments are as follows:

"The process of discounted cash flow is one which is known as a method of estimating present value of a capital asset in accounting processes. It is not a process which had previously been used by any of the plaintiff's valuers in the valuation of land. It is a process known to one of the defendant's valuers, Mr F, although he did not consider it an appropriate method in the present case"(p206)

He then compared the DCF with the traditional hypothetical development method and noted that the additional information required in the DCF is a projection of future rises in land prices and development costs (p207). He concluded that there is great uncertainty about the length of time between consideration of the concept and when the authorities would have actually allowed the subdivision to take place. Therefore, although the land has high development potential it would in all probability be some time after the date of acquisition. (p210) He then made the following comments about the use of DCF as a valuation method:

"I should now say that I am not satisfied that this could be an acceptable method of valuation in the present case. I express no opinion upon the question whether or not, in other circumstances and in other cases, a method of valuation by way of discounting the anticipated cash flow is a proper method of valuation of land.There is no evidence that the application of this method has either in theory or in experience produced results consistent with methods of valuation upon the basis of hypothetical subdivision which has, where necessary, been applied in the past"(p210)

He then analyzed the factors adopted in the DCF:

1. Time of starting and finishing, an important variable in the DCF:

"I conclude, therefore, that the turn-off of blocks would not have commenced until 1978". This is a period substantially later than that envisaged in the DCF.

2. The number of blocks likely to be obtained in the subdivision:

The blocks on the plaintiff's plan were too small for a tropical climate. After taking into account a number of factors necessary in the subdivision his honour concluded that the proper number should be about 9000 blocks as opposed to 11 230 proposed in the DCF.

3. The cost of development per lot:

The cost of development should be \$5 000/lot and not \$3 700/lot as proposed by the plaintiff .

4. Prices to be obtained:

About \$6 700/lot on average is a fair and proper price. This gives a gross realization substantially less than that claimed by the plaintiff.

5. Period of time for sale:

Agreed with the plaintiff that the turn-off of the whole area would be by 1986. Although optimistic this time is not "wildly optimistic" .

6. Rate of discount of the cash flow:

Although not happy with the 25% discount rate, there was no other evidence available and therefore, he reluctantly accepted that:

"It appears to me that even upon an assumption that a method of discounting cash flow is a method which can lead to an accurate valuation of land in circumstances such as the present, the plaintiff substantially fails to disclose a value by this method which approaches the value of approximately \$8 500 000 claimed to be revealed on the initial analysis of the plaintiff's valuers. Error has occurred by underestimating the time between the date of acquisition and the date when a turn-off of developed blocks might be expected, by underestimating the cost of development per block, by over-estimating the number of blocks, and by over-estimating the price likely to be obtained for each block" (p216)

"It would appear to be necessary in projections based on discounted cash flow to take account of rises in costs and likely rises in prices obtained. Rises in costs for the purposes of the analysis have been estimated at 6% per annum and rises in prices at 8% per annum. It is hardly necessary to remark that

the basing of a present value upon projections of this kind could be very dangerous without allowing for a wide margin of error by means of a heavy discount factor". (p217)

The plaintiffs then came back with an amended DCF which more accurately reflected the opinion of the Court. However, although better it was still rejected by Jacobs J:

"I have carried out this exercise in order to show how far wide of the mark was the initial valuation of the plaintiff's valuers because of incorrect assumptions made as the basis thereof. However, I would not consider it safe to adopt the indicated figure as a correct valuation of the lands, because I am not satisfied of the suitability in this case of a method of valuation based on discounted cash flow". (p218)

Eventually his Honour determined the market value using comparable sales and the hypothetical development method.

An Analysis of the Albany Case

The case well illustrates the problems facing a judge when a purported valuation includes a number of speculative elements and particularly when the DCF is sensitive to those variables. The problem is one of the quality or reliability of the evidence presented. Ultimately and typically, sales are resorted to directly, offering a simpler analysis using the "hypothetical development method". The use of direct sale evidence and the simpler method raises the subjective probabilities in the judge's (jury's) mind in regard to parts of the valuation method. For the definitive case on the use of direct sale evidence see *Leichhardt Municipal Council v Seatainer Terminals* (1979) 40 LGRA 353 known as the *Seatainer's* case.

Subjective probabilities applied to parts of the DCF should take into account its temporal nature so that over time (the DCF period), the probability of correctness becomes less. On the other hand, the hypothetical development method is non temporal and therefore, in this case has a higher probability of being correct. This is not to deny that in some cases DCF is the best method with the highest probability of correctness for example, a short but complex development period on vacant development land but under the circumstances facing the judge in Albany the whole exercise had a high speculative content and therefore, a low probability of being correct. Applying subjective probabilities to those parts of the DCF analyzed by Jacobs J the following schedule of probabilities can be constructed:

	DCF PROBABILITY	HYPOTHETICAL DEVELOPMENT PROBABILITY
Time of development:	0.4	0.6
Number of blocks:	0.8	0.9
Cost/lot:	0.3	0.5
Prices to be obtained:	0.2	0.8
Period of time for sale:	0.3	0.6
Rate of discount:	0.6	0.8
Overall probability:	0.0035	0.1037

Applying subjective probabilities to the sensitive parts of the valuation will emulate court decision making. It can be seen that using Pascal's "rule of multiplication" to determine the overall probability clearly favours the non temporal method of valuation. It is suggested that a similar type of analysis (which may also be subconscious) is made by the parties in the normative willing buyer willing seller transaction.

Conclusion

The above analysis suggests that there is a subjective quantitative process used in court decisions. The judge or jury subjectively and perhaps subconsciously evaluate the correctness of the parts of the valuation according to Pascal's probabilities. Further, it is suggested that this better emulates the "practical valuation" process. When one analyzes court decisions on this basis it is not hard to see why the courts have had so much trouble in accepting the quantitative methods promoted in academia. The use of GST puts the academic/valuer in proper perspective recognizing that the opinions and methods of the courts are far more important in the valuation system than the views of academics.

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