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Editorial

The quest for a future

On 1 September 1999 members of the New Zealand Institute of Valuers and the Property and Land Economy Institute of New Zealand will vote on the formation of one body, a Property Institute, to represent and promote their professional interests. The decision to merge comes at a time when the Valuers Act 1948 is under review and the market is demanding broader services in relation to property.

Motivated by mutual interest and future development the "one body", as envisaged will comprise two streams. One will be concerned with property management and the other with valuation. In due course it is likely to comprise valuers, property facilitators, asset managers, researchers, analysts and others involved in aspects of property transactions and management. It will provide for the future by being a single professional body for the property graduate.

The review of the Act is in keeping with government philosophy regarding professional bodies. but both that and the move towards a single organisation have specific implications for the identity of the Valuation Profession.

When passed in 1948 the Act reconstituted the NZIV from an incorporated society into a perpetual statutory body representing valuation professionals. Its aims were to maintain proper conduct, suppress objectionable practices, preserve valuers integrity and status and promote and diffuse valuation related knowledge.' Under it valuers had to maintain an annual practising certificate and could be fined, suspended or deregistered for gravely dishonourable or unethical conduct. The NZIV became the profession's guardian.....

Under the Act the Valuation Registration Board was also set up to register all persons qualified to value land for the public..... 2

From the Act came the term "Registered Valuer". Dubbed the "brand' name by the Institute, the term has been held in high regard by the judiciary, the legal profession, government and other professional bodies. Ethics, business standards and improvements in education have been contributing factors.

To the public registered valuer means that the valuation work being undertaken is handled by a person qualified to do so and who is unafraid of peer review in case of complaint. If the review of the Act results in total deregulation for the profession the term could be removed from New Zealand's statute books. This is not only of concern to the Institute but in a deregulated environment it could be crucial to the survival of the profession. On behalf of its members the Institute has a task force ready to negotiate with government over the retention of the term. It is

hoped therefore that the profession will go into the new organisation with the term preserved. No one will be permitted to practice under it without suitable qualification and experience.

In the 51 years since the Act was passed valuers have had to work in environments varying from acute post war constraint through to a free and open market economy under which the regulations affecting the property industry have been significantly amended. Although the Institute has been able to adapt to change it is not growing. With the Millennium ahead a sustainable future for the profession is important.

In the mid 1990's a new business plan was prepared for NZIV. It provided a blueprint on which to develop and pursue initiatives for change. Members gave Council a mandate for change. Now envisaged is dynamic organisation that not only meets the needs of the current property industry but facilitates a vision for the future. The implications are far reaching and should result in a new organisation in which the work of the registered valuer will continue and grow. In addition to valuation it is envisaged that other consultancy and management tasks may be undertaken by members of the organisation provided they comply with the standards and code of ethics of the new institute.

A property institute for New Zealand is in keeping with changes overseas, notably in Australia. In addition to enhancing professional development within the country it will create a potential platform for closer links with other off-shore organisations. The Institute already has agreements with Singapore, Australia, the United Kingdom and South Africa which provide with various restrictions for New Zealand valuers to work in those countries. With the increasing impact of technology and greater internationalisation of standards the links can only become stronger and the benefits more obvious.

Entering the new environment, however, depends on the decision of members in September of this year. The groundwork for a sustainable and exciting future for the profession has been laid. Making it work is an option members can choose.

1 Goverment Valuers- Valuation New Zealand 1896-1996
2 ibid

Legal issues in the New Millennium

Katrina Crooks,
Quentin Lowcay *and*
Ross Johnston

At midnight on 1 January 2000 many people will be celebrating the turn of the millennium. Whether there will be a lot to celebrate remains to be seen. The information technology industry will be facing one of its biggest tests yet, and no one is sure exactly how it will cope.

Clearly those in the Information Technology Industry ("IT Industry") can expect to be hit the hardest, but this is not just a problem which will affect computer buffs, the chances are it will affect you in some way. PCs, electronic doors, EFTPOS machines, sewerage systems; these are just a few of the electronically controlled systems that we rely on every day, which may experience problems in the Year 2000.

These problems are also likely to have a flow-on effect into many businesses. Even if a business has ensured that its own systems will work, each organisation is dependent on its customers and suppliers functioning properly. If one large business were to suffer major problems this could cause a domino effect through numerous others. The possibility that a number of small organisations could fall over completely is not that remote.

But besides the IT issues, of which most people are now aware, the Year 2000 presents significant legal issues. If things go wrong on 1/1/2000, chances are that people will look for others to take responsibility. For this reason it is important when conducting a Year 2000 audit, to review not only the IT systems but also the legal issues involved to determine what your responsibilities and rights in relation to others might be.

This article sets out the major legal issues related to the Year 2000 and the process that all businesses should employ to determine what their potential legal risk could be.

What is the problem with 1 January 2000?

The information technology problem associated with the Year 2000 relates to the way in which many computer programmes store dates. In the 1970s programmers conscious of conserving memory programmed computers to recognise and input dates in a

two-digit form for the year, rather than the full four-digit number. So while 1999 will be recognised by the computer as "99", the year 2000 will be recognised as "00". The effect this will have on computers could vary. The two most likely scenarios will be a total failure in the system causing it to shutdown completely or partially, or it may continue to function but generate errors in data by treating the Year 2000 as the Year 1900 or not recognising years after 1999 in its calculations at all. This latter possibility is perhaps the most serious, since there may be no external evidence of the problems occurring within the data being produced. Even if your system appears to be working normally, further checks may need to be made to ensure that all the data being created and processed is correct.

The problem is not limited to computer systems either. Any system which uses an electronic embedded chip may be affected. This may include electronic equipment such as videos and faxes, and many building maintenance systems such as lifts, security and air conditioning.

Identification of embedded chips in itself is extremely difficult, making it hard to identify which systems will need to be corrected.

Even before the Year 2000 itself begins, other date-related problems are likely to occur. Systems which use expiry dates, such as credit cards or supermarket food expiry systems, are already having to deal with Year 2000 expiry dates in those systems, and next year 12 month expiry dates could cause significant problems if the businesses using them are not yet Year 2000 ready.

Another date to be concerned about is 9 September 1999 (9/9/99). The figure "9999" was often entered into data fields to represent an unknown value or an indefinite time span. In some programmes it is used to signify the end of a file. To complicate this issue even further, many systems may not recognise 29 February 2000. Normally the turn of the century is not a leap year, however, according to the quad-centennial rule, every 400 years it will be a leap year. The Year 2000 is one of those years.

These problems may have a significant effect on all businesses, whether small or large. Security in buildings is likely to be affected - 1 January 1900 was a Monday and so automatic doors controlled electronically may open on 1 January 2000 even though it is a Saturday.

Lifts, air conditioning and lighting are also likely to be affected and may not function at all. So far the government has given no guarantees that essential services such as electricity and water will be up and running in the new millennium, and so buildings may be without these amenities for some time. Other aspects of business such as accounts payable/receivable, telephone systems and general office equipment are also likely to experience problems.

We need only to look at the Auckland power crisis to see how a lack of essential services can affect the economy on a large scale. The consequences of that failure will pale in comparison to the wide-scale interruptions that the whole global economy could face if computers start to crash or malfunction on 1 January 2000.

What are the legal issues arising out of the Year 2000?

Litigation in relation to Year 2000 issues is already emerging in the United States. The Commerce Commission here is also currently investigating the legality of supplies to recent purchasers of Year 2000 non-compliant software who buy upgrades at more expense and with features which they do not need or want.

Most businesses now have not only begun some kind of audit of their information technology systems but will be well advanced into the testing phase. However, with such litigation likely to bloom in the 21 "century when problems actually occur, it is vital that an organisation also assess its legal risk and legal rights in relation to others as part of its overall Year 2000 strategy.

One of the most important considerations from a legal viewpoint is a business's contractual relationship with both the suppliers of its computer systems and its own customers. All contracts should be reviewed to determine any possible liability and rights that the organisations may have should problems occur.

Supply Contracts

All supply contracts for computer systems including software development agreements, maintenance and support agreements, and licence agreements should be examined. The important provisions to consider in any such agreement are:

a) The extent of maintenance and support services: If the contract provides that the service provider will correct any errors in the system, it is arguable that this requires the service provider to fix any Year 2000 problems. However, it is unclear whether such a problem would come within the definition of an "error" since it is a foreseeable event which could be prevented. This may depend on the specific definition contained in the agreement.

b) Express warranties of the performance of the system: Some contracts may include a specific warranty in relation to Year 2000 compliance, which will clearly cover or exclude liability for any Year 2000 problems. However, other warranties as to the overall performance of the system, and the error-free running of the system may also be relevant. This will depend on the wording of any particular warranty.

c) Implied warranties of the performance of the system: If they have not expressly been excluded, statutory warranties may also be implied to the agreement. For example there are warranties for fitness of purpose and merchantability contained in the Sale of Goods Act 1908, and similar warranties in the Consumer Guarantees Act 1993 which may apply to businesses using goods which are normally destined for household use. If a system experiences difficulties due to a Year 2000 problem, these warranties may also come into play. Many contracts specifically exclude such warranties, so you should check any agreement for reference to these statutes.

4) Specifications for performance of the system: Most support or maintenance agreements will include operational specifications for the system requiring the supplier to correct any errors (perhaps within a specified period of time). Such specifications or response times will be relevant should any failure in the system occur which renders it non-operational for a period of time.

e) Any exclusions or limitations on liability included in the contract: Depending on the particular contract any loss related to Year 2000 problems may be expressly excluded. Many contracts will include monetary limitations on the liability of a party, or will limit liability of the supplier to the value of the equipment or software purchased. In this case even if Year 2000 liability is covered by the contract, you may be able only to recover a small portion of your loss up to this cap.

)l Consequential loss: You should also check for any exclusion of consequential loss. If the contract contains such an exclusion you will only be able to recover direct loss such as the cost of fixing the system if problems occur, and not other loss which flows on from this, such as loss of business, or loss suffered by your customers, for which you are responsible. This may severely limit the amount of damages available to you. You should also consider any provisions requiring you to make a claim within a certain time period after the conclusion of the agreement. Knowing when the Year 2000 liability could have arisen will then be crucial.

g) "Force Majeure" clauses: A Force Majeure clause excludes a party's liability for anything arising out of circumstances beyond its control or an "Act of God". It is unclear whether the Year 2000 can be considered a Force Majeure event since it is not an unexpected event, and is one that can be avoided. However, depending on the wording of any specific clause it is possible that liability could be excluded through a Force Majeure clause.

h) Intellectual property provisions: These types of clauses may be relevant if modifications need to be made to the system to ensure Year 2000 compliance. If the intellectual property in the system is owned by a licensor, you may not have

the authority to make alterations to it without the licensor's consent.

i) Restrictions on modification of the system: Many agreements may include restrictions on copying software, disassembling it or modifying it in any way. Furthermore the warranties may only apply if no modifications have been made to the system. Therefore you should be aware that any attempts you make to modify the system to make it Year 2000 compliant may preclude you from relying on warranty provisions if there are still problems. It would be advisable to seek the consent of the supplier if they are not performing the Year 2000 rectification services.

J) Remedies in the contract: If particular remedies are provided for failure in the system these need to be considered. Monetary compensation is often excluded, leaving correction of any errors in the system the only remedy available. This may be of small comfort if your whole system is disrupted and you suffered significant losses as a result. You should also remember that any remedies you have depend on the provider also being solvent after the Year 2000. With predictions that many small business may not survive, this cannot necessarily be assumed.

If you are doubtful as to the Year 2000 compliance of any components of your system you should write to the supplier requesting a statement which clarifies this. Make sure that any statement you receive clearly states that the component will process dates correctly prior to, on and after 1 January 2000.

Any contracts you enter into from now on should ideally contain Year 2000 clauses which specifically deal with the problem and set out the exact position. Standard clauses have been developed for this purpose by organisations such as the British Standards Institute Committee, and can be incorporated into any contract (this document is widely available on the Internet, its reference is DISC PD2000-1).

Liability to your customers

Besides your rights in relation to your suppliers, you also need to consider your potential liability to your customers if your system experiences problems which impact on your ability to fulfil your obligations to them. If you experience a Year 2000 failure, even one for which your supplier is responsible, you may be liable to your customers under the contracts you have with them. You should examine all contracts with your customers in a similar way as your supplier contracts your potential liability. In doing so, liability provision, warranties, and clauses excluding or limiting liability will be important.

Your customers may also require assurances from you that your systems are Year 2000 compliant. At present many organisations are sending out standard letters including questionnaires relating to the state of your system, or asking you to provide a written assurance that you will not experience any Year 2000 problems.

Although you do not want to lose the confidence of your customers you should carefully consider your response to such requests. If you guarantee Year 2000 compliance and then your systems experience problems your customers will be entitled to rely on the assurances that you gave, and claim that you misrepresented your position. This could provide the basis for a claim against you under the Fair Trading Act 1986 for misleading and deceptive conduct. It is a good idea to formulate a standard response which fairly and accurately outlines your current Year 2000 project, which you can then send to any customers who request a statement. Naturally, it should be checked by your IT Industry legal advisors.

The Fair Trading Act 1986 and the Consumer Guarantees Act 1993

As already discussed, the Fair Trading Act may come into play if an organisation makes statements regarding its Year 2000 readiness which later prove to be incorrect. This works both ways. If your business has received such assurances you will be able on those statements that possibly make claims for any that are inaccurate. Conversely you maybe liable for any damage suffered if they are inaccurate. Conversely you may be liable if any statements you make are incorrect.

The Fair Trading Act and the Consumer Guarantees Act may also have a wider relevance in relation to the general sale of equipment which is not Year 2000 compliant. The Consumer Guarantees Act 1993 provides that any goods sold which are normally consumed for a household purpose must comply with certain warranties such as fitness for their purpose and acceptable quality. Arguably any products which have been sold in recent years which are not Year 2000 compliant do not meet these requirements. Since anyone buying such products would also expect that they would function in the Year 2000 the sale of such products itself could amount to misleading conduct in terms of the Fair Trading Act 1986.

It is, however, unclear exactly how long ago the obligation to sell Year 2000 compliant goods, or at least point out to customers that such goods were not compliant, would have arisen. It seems clear that products sold in 1998 should be compliant but what about products sold in 1995 or 1993? Many organisations have not really become aware of the problems involved since early 1997, or even earlier this year.

Directors' liability and negligence

Both directors of a company and the company itself could also be found negligent for failing to ensure that Year 2000 problems were adequately addressed. As already stated, the company itself could be liable to its customers. This could include a failure to sufficiently ascertain the compliance of other organisations on which you rely.

Directors may also be found to be negligent in relation to the company for failing to ensure compliance. Such a failure may also constitute a breach of the directors' duties to take reasonable care and skill under the Companies Act 1993.

Statutory obligations.

Apart from directors' obligations under the Companies Act, there are a number of statutory obligations with which an organisation may find it difficult to comply if it cannot properly carry on business in the year 2000. It may be necessary to develop some contingency plan as to how these obligations could be met if Year 2000 problems are experienced.

For example, tax obligations must be met. If a business's financial system is not in working order it may be very difficult to make tax payments or returns on time. The IRD has made it clear that Year 2000 problems will not be an acceptable reason for failing to comply with any tax responsibilities. Such failure could result in significant penalties being imposed.

Health and safety requirements are also worth considering. With a significant risk to electricity, water, sewerage, air conditioning, lifts and security systems it is more than likely that some buildings will become uninhabitable. This will not only mean that businesses will have to find alternative accommodation for their workers but if they insist their staff work in such buildings they may also be in breach of health and safety legislation and risk fines under legislation. Tenants should seek assurances from their landlords that their building will be habitable after 1 January 2000.

Insurance Issues

Another important point to consider is your insurance cover for any loss you may suffer. To ascertain your exact position you will have to check your insurance policy, however, many policies now will include a specific exclusion for Year 2000 losses. Even if there is no specific exclusion the position that is emerging from the insurance industry is that such losses will not be covered by normal policies because losses caused by the Year 2000 are foreseeable, preventable losses. If this is the case, you cannot count on being compensated for any loss from your insurance company. Business Interruption Insurance and Director and Officers' Liability insurance are also unlikely to provide adequate cover. Advice should be sought from your insurance broker to confirm the position.

A Year 2000 Audit Plan

The risks outlined are not unavoidable and the first step is to develop a systematic plan for dealing with all potential areas of risk. Analysis of all your contracts with others is the first step.

In addition, a comprehensive

analysis of the year 2000 technical issues needs to be conducted, and more importantly, recorded in an audit plan in case of future claims or issues. This plan should cover these areas:

- A systematic plan for review of the entity's current systems for Year 2000 disruption;
- The extent and nature of the impact of Year 2000 on the entity's business as determined by the review;
- The likely time frame and cost of options (including, as appropriate, replacement and modification of business systems). This will usually require a scoping review;
- The most effective and expedient options to accommodate Year 2000 compliance issues;
- Implementation and testing of the selected option;
- Back-up strategies, disaster recovery and other plans if failures occur or can not be rectified in time; and

Policies to ensure that future IT projects are consistent with the Year 2000 strategy and ensure ongoing Year 2000 compliance.

Conclusion

The Year 2000 poses a potential risk to all businesses in some way. A further complication is that since all businesses are so closely interrelated it is likely that the failure of one business will have significant repercussions on a number of other businesses. If that is the case, significant amounts of litigation could well take place after 1 January 2000.

To avoid any risk to your business it is necessary to consider all the legal implications of your position, as well as the actual underlying information technology, and to take action to minimise any liability.

In the end, those who survive the new millennium will be those who planned. On the morning after the celebrations it will be a bit too late to start wondering whether you should have done more.

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How much is Your Company Worth?

Murray Gray

Valuations of shares in unlisted companies are frequently completed. These valuations are often required for the purposes of the transfer of shares or the division of assets including matrimonial property.

In this article Murray Gray of Darroch Limited, Dunedin discusses aspects of share valuation and concludes that the appointment of a valuer with sufficient expertise is perhaps the most important step in any share valuation.

"There is no topic about which greater differences..... may exist than the valuation of shares in a private company....."

This statement, which was made by a blouse of Lords Judge, is cold comfort to shareholders in new Zealand's 188,000 unlisted companies. The article considers some causes of differences in valuations and looks at the skills required by a share valuer.

What are Shares?

A share is defined as "a unit of ownership in a company". All of the shares represent 100% ownership of the company. The value of all the shares or the shareholders' equity, is:

Value of Assets
less Debt
equal Shareholders' Equity
(100% of the shares)

Therefore, *all* of the shares can be valued by deducting the value of debt from the value of assets.

Shares give the holder certain powers and rights. These are generally set out in the company's constitution. The right to vote at company meetings is particularly important. More shares mean more votes and therefore more say in the company's affairs. The ability to control a company has a significant bearing on the valuation process, (an issue, further discussed later in this article).

What is value?

A valuation must be consistent with the relevant definition of value. Market value generally applies to valuations of real estate. There is an internationally accepted definition of market value. This includes the following assumptions:

- willing buyer and willing seller
- arms-length transaction after proper marketing
- parties acting know-ledgeably, prudently and without compulsion.

The definition of value is to be applied to share valuations is generally in the company's constitution. Most commonly this is *fair value* rather than market value. While it is generally accepted that the two definitions are similar it is apparent that fair value leaves more room for interpretation.

Court decisions in other countries indicate that fair value implies that the valuation should be fair and equitable to the parties. What is fair and equitable may be different to market reality. In particular, many court decisions do not allow for the fair value of shares to include a discount for the difficulty of selling the shares. This is at odds with market valuations where such discounts are very widely accepted and are supported by anecdotal evidence.

The recent Australian case, *Holt v Cox (1994) 15* ACSR *313,* found that when a minority shareholding was compulsorily purchased (by other shareholders) the vendor was entitled to a premium and should not be subject to any discounting. A premium was considered fair given the circumstances. This is at odds with market value where a discount would typically apply to a minority holding.

The fair value concept is often responsible for differences between valuations. Who is to say what is fair? In my experience the potential for disagreement can be reduced by identifying court decisions where the circumstances are similar. However, often the "grey area" remains.

Which Valuation Method?

The value of shares is equal to the present value of future cashflows. The cashflows may take the form of dividends, company earnings, or proceeds from a wind-up of the company. The selection of an inappropriate valuation approach can result in gross over or under valuation. Table 1 presents a summary of the different valuation approaches and when, as established by case law, it is appropriate to use them.

The notional liquidation method is generally only applied when a liquidation would reasonably be contemplated by the purchaser. This point was covered in Commissioner of Succession Duties (S.A.) v Executor Trustee and Agency Co. of South Australia Limited(19477) 74 CLR358:

"To value shares in a company which is a going concern on the basis that the company is in voluntary liquidation ..... savours of unreality. The choice of such a mode is not calculated to produce a fair value. it is more likely to produce a false value. "

As stated previously, selection of the wrong method can make a big difference to the valuation. For example, the notional liquidation method to a going concern will often result in a different valuation to an earnings based assessment. This is because:

- in a notional liquidation valuation the company's assets are valued at the sale value while an earnings based valuation assumes a continuing use value. These values can be very different.
- Both valuations establish the value of the company's assets less liabilities, or net assets (albeit subject between sale value and continuing use value).

However, the notional liquidation approach goes a step further by making deductions for:

- ❑ the costs of selling assets
- ❑ liquidator's costs
- ❑ taxes
- ❑ an allowance for profit to the purchaser who would not purchase a company with the intention of liquidating it unless there was a profit to be made.

It is important that each case be considered on its merits. In some

Size of shareholding	Dividend Yield	Earnings Basis	Notional Liquidation
Minority Interest			
Company pays dividends regularly No dividend policy			
Majority Interest			
Going Concern			
Not Going Concern			
Low earnings relative to assets			I'
Power to force liqudation			

able 1: Valuation Method Guidelines

instances the principles set out in table 1 may not apply.

The most commonly used share valuation method is the earnings based approach. There is plenty of scope to misuse this method; this is shown in the following section.

Earning Based valuation & the Importance of Growth Prospects.

Shares can be valued by assessing the present value of the company's estimated future earnings or cashflows. This is commonly done by capitalising profits.

The simplicity of capitalising profits is appealing. It involves estimating two figures:

- maintainable earnings. That is, what is the level of earnings that the company appears capable of sustaining under normal circumstances; and
- a capitalisation factor. Commonly a price to earnings (PE) ratio is used. Alternatively a capitalisation rate can be applied; this is simply the reciprocal of the PE ratio. Capitalisation rates are calculated as:

Risk free rate of return (eg Government Stock)
plus Premium for the riskiness of the investment
less Anticipated growth in earnings.

The valuer's judgement and analysis is required to assess the riskpremium and growth allowance. Valuations are often completed without an appreciation of the importance of these factors, particularly growth: *See table 2*

The table shows that a small increase in the growth allowance can result in a large increase in value. Consequently we believe that it is fundamental to any earnings based valuation to complete an analysis of a company's growth prospects. However, we often find that this is not done and is commonly the cause of differences in valuations.

Estimates of growth are a hot topic in the tourism industry at present.

Shares not Assets

The Courts have emphasised that the value of shares is not simply a pro rata share of the company's net assets (assets less liabilities). A landmark New Zealand case, *Hatrick V Commissioner of Inland Revenue (1963) NZLR 641,* addressed this issue:

"...itwas always recognised that the Court was asked to value, not the assets of the company, but the shares o .....and the Court having valued the assets must then go on and endeavour to ascertain the mind of a potential purchaser of those shares. " (emphasis added).

A United States of America case, *Ray Consol. Copper Co. v United States, 45 S. Ct. 526 (1925)* also emphasised this point:

Assumed growth		0% p.a.	5 % p.a.
Maintainable earnings	(A)	$100,000	$100,000
Capitalisation rate			
Risk free rate		7%	7%
plus Risk Premium, say		10%	10%
		17%	17%
Less Growth		0%	5%
	(B)	17%	12%
Indicated value	(A)I((B)	$588,000	$833,000

Table 2: Illustration of Impact on Growth on Valuation

"The capital stock of a corporation, its net assets, and its shares of stock are entirely different things.....The value of one bears no fixed or necessary relation to the value of the other. "

Cases such as these have also established that in most instances:

- when valuing on a notional liquidation basis deductions from the value of net assets must be made for taxes, liquidation costs and profit to the purchaser; and
- the ability to control the company must be considered. For example:
  - ❑ Minority interests, or parcels of less than 50% of the company's shares, do not confer the voting power necessary to control the company. As a result minority shareholders can have little or no say in how the company is run. For this reason minority interests tend to sell at prices which are less than their pro rata share of the value of the total equity in the company. Studies have concluded that discounts of around 30% are common. However, the level of discount should vary depending on the size and rights of the minority interest.
  - ❑ On the other hand, controlling interests often sell for prices in excess of the owner's pro rata share in the company. Premiums in excess of 50% have been recorded.

The distinction between the value of a company's net assets and its shares can cause confusion. This can be due to:

- the valuers' interpretation of what is "fair and equitable". For example, in *Page v Page (1981) 5 MPC 114, 115, a* matrimonial property case involving a notional liquidation valuation, it was held that it was inappropriate to allow for liquidation expenses and for profit to the purchases when one of the parties would retain the assets. However, more recent matrimonial property cases have allowed such deductions.
- differing opinions as to whether a minority interest discount should be applied, and if so, the size of the discount. Market evidence that discounts do occur and that these are frequently large, however, whether this is "fair and equitable" is another thing.

Share valuation case law has established many principles for identifying the value of shares as opposed to assets. All share valuers should be familiar with this law.

Beware - Price may not equal Value

Price does not necessarily equal value. This is evidenced by the sharemarket. Prices change every day but in most cases the inherent value of a share is not so volatilex. Successful investors such as Warren Buffett, the American billionaire worked this out a long time ago.

There are many explanations for a short term volatility of prices. Panic selling and rumour are sometimes responsible. Irrational or poorly informed action by investors may also cause price changes. Often these causes have nothing to do with the economic viability of the company which is the key to its value.

Valuations of unlisted shares call for an assessment of value rather than price. As already stated, value is the present value of future cashflows. A valuation is generally more reliable when it is based on a calculation of this present value rather than a comparison with current share prices.

We have seen valuations of unlisted shares which are based on the price to earnings ratio of a listed company which applied at the date of valuation. This approach can be dangerous unless a thorough analysis of the "comparable" listed company is completed. Misleading valuations occur when the price of the "comparable" listed company does not equal value.

The Share Valuer

Anyone is New Zealand can be a share valuer. There is no legal requirement for specific qualifications. This causes problems as a lack of expertise often results in unreliable valuations and can cause disputes between shareholders. This can ultimately result in unnecessary and expensive litigation

Share valuation requires some expertise in a number of fields including:

- Valuation
- Finance
- Accounting
- Law

In some countries there are professional bodies for business valuers. Members have business valuation qualifications and must abide by standards. Unfortunately in New Zealand no such body exists and, as a result, share and business valuations are largely unregulated. While this situation continues we believe it is inevitable that poor share valuations will continue to be common.

Conclusion

The valuation of shares is a specialised skill. A valuation will require at least several judgements to be made. As a result it is likely that there will be some differences in the conclusions of any two valuers. However, these differences can be minimised by the valuers having sufficient technical skills and knowledge of relevant law. Therefore, to minimise the risk of a poor valuation the appointment of a specialist is paramount.

About the author

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With the restructuring of Valuation New Zealand on 1 July 1998 the administration of the Valuers Registration Board now functions as part of the new Office of the Valuer General in Land Information, NZ.

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"An Investigation into the Impact that the purchase of land for forestry has had on pastoral hill country farm prices"

Julian Rattray

An NZI V Post-graduate Research Paper

Introduction

Forestry is a diverse and very complex business. Up until recently it has been promoted as having the potential to be one of New Zealand's largest future export earners. It also has many other benefits such as being environmentally friendly and a good investment plan for retirement. The increased interest in forestry led to the planting boom of the early 1990's, characterised by a high level of public interest and investment, large investments in processing, and recognition that plantation forestry is a sustainable land use well suited to New Zealand.

At the same time public awareness of environmental issues also increased, resulting in a proliferation of environmental protection legislation which culminated in the Resource Management Act, 1991 and its subsequent amendments. For forestry companies, corporations, syndicates, and investors this has led to changes in forestry practice. These changes include the increased use of pastoral hill country for new forestry plantations, due to: (1) Changes in the classification of native scrub, resulting in greater restrictions on clearing of native scrub and (2) increased costs of preparing land for planting. This is most evident in Northland where three-year-old Manuka covering now often prevents the land being purchased for forestry.

The main opportunities for new forestry planting in the 1990's is the four to five million hectares of marginal pastoral hill country farmland where forestry is seen as a more economic and environmentally friendly option. The removal of a tax regime unfavorable to forestry in 1991 coupled with increasing export log prices in the early 1990's and the slide of world beef and sheep prices, meant that in the short-term forestry investors were able to `out-bid' pastoral hill country farmers for land in certain areas. However, since the completion of this research, the collapse of a number of Asian Banks and the destabilisation of the Asian economy in 1998 has in the short term led to a decline in export log prices. This has removed the

short-term economic advantage that forestry had over sheep and beef farming from 1991 to 1997.

This article presents the results of a pilot study, which gave consideration to the impact that the purchase of land for forestry from January 1991 to January 1997 had on pastoral hill-country farm prices. Three methods of analysis were adopted: (1) Discounted Cash flow (DCF) analysis, (2) Descriptive Statistical analysis, and (3) Multiple Regression Analysis. Data for the pilot study was collected from various sources, with general statistical data being utilised in the DCF analysis, and sales data on properties located within the three regions being used for the multiple regression analysis.

Land Use

This pilot study is based on the concept of highest and best use. The theoretical basis of the "highest and best use" concept is that purchasers would base offering prices on the most profitable land use. Therefore a DCF analysis was undertaken to test whether forestry was more profitable than sheep and beef farming between January 1991 and January 1997. The main advantages with DCF methodology are (1) it uses market information, (2) it can cope with lfuctuations in income stream, and (3) it accounts for the time value of money. The main disadvantage is that it requires a large number of assumptions.

All financial figures for forestry and sheep and beef farming were based on data averages for the North Island of New Zealand from 1993 to 1996. Average efficient management was used as the basis and all income and expenditure figures were calculated on a per effective hectare basis. The net income that the property owner would receive in the future from both forestry and sheep and beef farming was calculated over a 28 year period and then discounted back to give the net present value (NPV) by the application of the capitalisation rate.

The net present value from forestry on average North Island Hill country was calculated to be $5,968 per hectare, while the net present value of pastoral farming was calculated to be $2,043 per hectare. Under the sensitivity analysis for sheep and beef farming to return a profit that is as great as forestry, the main variables for forestry return, `log price' and transportation costs would have to significantly change. Log prices would have to drop from an average of $135 / m3 to $70 /m3, or transportation would have to increase from an average of 15/m3 to 84/m3. While it is unlikely that `log price will fall around 50% in value, properties for which distance to market (timber mill or sea-port) is great, higher transport cost coupled with lower log price may remove the comparative economic advantage that forestry has over sheep and beef farming.

The DCF analysis showed that between January 1991 to January 1997 forestry had a comparative economic advantage over sheep and beef farming on hill country properties in the North Island. Thus, indicating that forestry could theoretically be affecting pastoral hill-country farm prices through changing land use patterns (i.e. a shift in land use from sheep and beef farming to forestry).

Next discussions with forestry valuers, consultants, and other professionals occurred in order to identify whether they thought that changing land use patterns existed in practice. Those involved in the discussions all thought they had observed changing land use patterns, where pastoral hill country farming was moving into forestry. Furthermore, three regions were selected to represent property markets where different stages of land uses dominated.

The greater Wairarapa region was selected as it represents a region in which agriculture set land values (farmers competing primarily with other farmers for land). The King Country was selected to represent a region in which land values were set by both agriculture and forestry interests (farmers competing with forestry buyers). The Bay of Plenty was selected to represent a region in which forestry sets land values, (forestry buyers competing primarily with other forestry buyers).

The greater Wairarapa region incorporates the South Wairarapa, Carterton, Masterton, and the Tararua Districts (as

defined by Valuation New Zealand boundaries). The purchase of pastoral hill country land for forestry in this region tends to be predominantly for syndication investors and private investors. Although the forestry company, Earnslaw One, does have interests in the Tararua District. The rural property market within the southern end of this region is affected by its close proximity to Wellington City. This influence included the subdivision of economic farms into `lifestyle blocks'. To remove the influence of lifestyle blocks from this research all properties less than 80 hectares in size, within all three regional areas, were screened out.

The King Country region is equivalent to the Ruapehu District (as defined by Valuation New Zealand boundaries). Over the time period investigated, the rural property market within the King Country has been influenced by Carter Holt Harvey Forestry's, strategic land purchasing project. Carter Holt Harvey's purchases pastoral hill country in the King Country for forestry to ensure an even supply of timber would flow to their timber mill at Tokoroa.

The Bay of Plenty region incorporates the Taupo, Tauranga, Rotorua, Western Bay of Plenty, and Whakatane Districts (as defined by Valuation New Zealand boundaries). The purchase of pastoral hill country for forestry in this region tends to be by large forestry companies making strategic decisions. For example traditionally much of the Eucalyptus required by the pulp and paper mills has been imported from Australia. However concerns over the possible future introduction of environmental laws in Australia which would limit the supply of native timber (i.e. Eucalyptus) to New Zealand, have resulted in a number of pastoral hill-country land purchases around Kawerau.

The main feature identified from a descriptive and initial statistical analysis of the data was the proportion, in volume, of forestry to pastoral sales in each set of data (refer to Table One). In the Greater Wairarapa region pastoral sales dominated, in the King Country region sale volume was even, and in the Bay of Plenty region forestry sales dominated. These results are encouraging as they are in line with the hypothesis.

Regression Analysis

Following on from this, the use of "regional" multiple regression analysis was undertaken to identify and predict land use variables within each of the three regions. It was predicted that we would see a different range of variables identified in each of the regions. A property sales database was set up for each region investigated, resulting in three sets of data being analysed. Sales data on forestry and pastoral (sheep and beef) farms from January 1991 to January 1997 was used in the multiple regression analysis.

Appendix One Tables A 1, A2, and A3 show the results of forward "stepwise" multiple regression analysis for the Greater Wairarapa, King Country, and Bay of Plenty regions respectively.

The dependent variable in the study was "sale price per hectare". As the data sets contained property sales from January 1991 to January 1997 it was necessary to account for the

Table One

Area	Greater Wairarapa Region	King Country	Bay of Plenty
No. Sales.	230	79	46
No. Forestry Sales.	32	38	42
No. Pastoral Grazing Sales.	198	41	4
Mean Sale-price per hectare.	$1,227.42	$1,261.31	$3,395

depreciation of the purchasing power of the dollar over time. The main analysis used dummy variables to account for time, while an indexed sale price per hectare analysis was run as a check.

A literature review and discussions with forestry valuers, consultants, and other professionals helped to identify the major economic factors affecting both forestry and pastoral (sheep and beef) returns. These factors or key variables were used as the independent variables within the regression analysis. They included: Area, Soil-type, Climate, Distance to primary markets (timber mills), Distance to secondary markets (seaports), Contour, and Productions. Site index was not included as an independent variable as by having soil-type, climate and contour variables in the model, the inclusion of a site-index would provide the additional benefit.

For contour, soil-type, and climatic factors, all properties were sorted into their valuation roll area and then the properties were put into the regression analysis utilising dummy coding. For Distance to port and Distance to mill factors, all properties were sorted into valuation roll numbers and their distance to the nearest port/mill at 10 kilometre intervals was calculated. Area was expressed in total hectares as insufficient details could be obtained to allow a per effect hectare analysis. For production the average district production was calculated and then expressed in stock units per hectare.

Research Findings

The variables identified in the Greater Wairarapa region as being important in the determination of land value are: Area, soil-types, % of improvements on the farm, climate, and distance to port. The inclusion of the variables: area, soil-type, % of improvements, and climate reflect variables that are primarily used to determine the value of pastoral farms. The inclusion of the variable `distance to port' into the equation may suggest that forestry does have an influence in the Greater Wairarapa region.

However, due to the way the data was set up the factors relating to climate, contour, soil-type, `distance to port', and `distance to mill' are all forms of location factors. The high correlation between these factors suggests that the location of the property in the Greater Wairarapa region is important. Thus, the inclusion of distance to port most likely reflects the fact that distance to market is important to agriculture in the Greater Wairarapa. This is further supported by the fact that the Greater Wairarapa region is large with the main markets being well spread out.

While the predictive ability of the equation is less than satisfactory (i.e. only accounts for 53.5% of the variation in sale price per hectare and has a standard error of $404 per hectare) it does appear that forestry interests have little influence on land prices in the Greater Wairarapa. This result therefore tends to supports the hypothesis.

In the King Country the variables identified as being important in the determination of land value were soil-types and (by relaxing the' entry criteria") distance to mill. In interpreting the regression analysis for the King Country it is important to consider the variables not included in the analysis. Both contour and production were removed from the analysis as they were constants.

The hypothesis states that both forestry and pastoral farming should be competing for land however, the results from the regression output make it hard to determine whether this was the case or not. For forestry to be competing with pastoral farming it was expected that both `distance to mill' and `distance to port' would be predictor variables.

There are two plausible explanations as to why `distance to port' was not in the equation. First, ' distance to mill' and `distance to port' are highly correlated therefore the inclusion of both into the regression equation is unlikely to improve the r2 and so one will be automatically left out. Secondly, over the period studied (January 1991- January 1997) most land for forestry was purchased by Carter Holt Harvey Forestry's. The reason behind Carter Holt Harvey land purchases was to ensure an even flow of timber to their mill at Tokoroa. Therefore distance to port would not have been an important criteria if the vast majority of timber was going to their own mill.

For pastoral farming to be

competing with forestry it was expected that production would be a predictor variable, unfortunately due to data limitations and constraints this variable was removed from the equation as it was a constant. Therefore while this result could suggest that forestry and pastoral farming are competing within the King Country we cannot be certain.

The variables identified in the Bay of Plenty as being important in the determination of land value were distance to port and distance to mill. The inclusion of these variables that reflect forestry would tend to suggest that forestry is dominant in the Bay of Plenty. Although it was expected that both distance to port and the distance to mill would be statistically significant in this region, it was not expected that the distance to port would be of higher importance than the distance to mill. Two possible explanations for this exist:

1. Most of New Zealand's logging exports from Bay of Plenty leaves via the Port of Tauranga. As the majority of New Zealand timber is exported as raw product, the distance to port is of vital importance in terms of its profitability.

2. Typically the distance to the primary market (mill) is of greater importance, than the distance to the secondary market (port). However, in the Bay of Plenty the large number of mills reduces the significance of distance to mills below that of distance to port.

While the predictive ability of the equation is less than satisfactory (i.e. accounts for 48.5% of the variation in sale price per hectare and has a standard error of $995 per hectare) it does appear that this result supports the hypothesis.

Conclusion

By reference to the research findings, both on a qualitative level and quantitative level, the following can be said:

First, the supplementary comparison of returns through the use of DCF analysis supports the underlying theory, that a shift in land use from sheep and beef farming to forestry was occurring on marginal pastoral hill-country.

Secondly, at a qualitative level, the volume of forestry to pastoral sales in each of the three regions appears to support the theory of changing land use.

Thirdly, through the use of regional multiple regression analysis the identification of regions representing different stages of land use domination (farmer competing with farmers, farmer competing with forestry investors, and forestry investors competing with forestry investors) was not conclusively proven. However, the results did not disprove the hypothesis either.

The secondary objective of identifying the key variables that have the most impact on the purchase of pastoral hill country land for forestry was met with mixed success. Qualitatively the variables identifies were: Area, Contour, Access, Growth Capacity (soil type, climate) and location in relation to potential markets (distance to mills/ports). While quantitatively, by reference to the research finds, the variables that emerge as key variables were:

1. Distance to primary and secondary market

2. Soil-type

Limitations

A number of limitations relating to the pilot study data and reported results are acknowledged.

- The influence of data generalisation is possibly the major limitation to this research. The independent variables were affected due to generalisations made about their location, that is:

  i) For distance to mill, distance to port, soil type and contour the properties were sorted into location via the use of their valuation roll numbers. That meant no property specific data for these variables was included.

  ii) Climatic factors were assigned based on generalised climatic information. This meant

climate is a form of location factor rather than climatic factor.

iii) The production district averages were used based on production figures available.

Forestry in the major forestry regions in New Zealand (i.e. Bay of Plenty, Gisbourne etc...) is dominated by large forestry companies. The major cost to these companies is the billions of dollars they have tied up in timber processing and treatment plants. Often land sales and land purchases by these companies are part of their strategic planning to ensure an even flow of timber to these plants. Furthermore large forestry companies have private roads on which they pay no road tax, this may have distorted the distance to mill and distance to port variables.

The objectives of this pilot study mean that the regional multiple regression equations were set up as predictors of the key variables acting within any one region. They are not meant to be used to accurately predict sale prices.

In viewing the overall findings it must be noted that the results are the product of a pilot study carried out in specific regional areas over a specific time frame, and caution must be used in making generalisations from them or applying them to other areas. Fundamentally, the results attained in each region cannot be applied to other locations.

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About the author

Julian Rattray graduated with a Bachelor of Applied Science from Massey in 1997 having specialised in rural valuation management. He has since graduated with a Diploma of Business Studies specialising in urban valuation and completed a post graduate Diploma in Business Administration with an emphasis on property. He is now working for Warick J. Tiller on residential property in the Wellington area.

Appendix One

Table Al: "Stepwise" Regression The Greater Wairarapa Region

Equation Number 1 Dependent Variable.. Sale-ha

Variable(s) Entered on Step Number 9.. SBRWN STPBROWNE

Multiple R	.63057
R Square	.39762
Adjusted R Square	.37298
Standard Error	509.52780

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	9	37701423.59468	4189047.06608
Residual	220	57116086.60914	259618.57550

F = 16.13539 Signif F = .0000

VariablesintheEquation

Variable	B	SE B	Bela	T	Sig T
AREA	-.453588	.080167	-.321560	-5.658	.0000
DPORT	-5.702191	2.071736	-.158336	-2.752	.0064
DVWAC	-278.0554	83.359827	-.193131	-3.336	.0010
VLOAM	419.213686	120.842989	.192031	3.469	.0006
SBRWN	177.525343	81.552377	.123907	2.177	.0306
@ IMP	1391.361158	279.049693	.278034	4.986	.0000
N91	-474.261416	158.208636	-.164259	-2.998	.0030
N92	-492.959713	103.048684	-.265712	-4.784	.0000
N93	-328.231005	98.187833	-.181442	-3.343	.0010
(Constant)	1849.123548	236.136908	7.831	.0000	

Table A2: "Stepwise" Regression The King Country Region

Equation Number 1 Dependent Variable.. Sale-ha

Variable(s) Entered on Step Number 5.. N96

Multiple R	.73162
R Square	.53526
Adjusted R Square	.50343
Standard Error	404.09836

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	5	13729679.24809	2745935.84962
Residual	73	11920570.20093	163295.48220

F = 16.81575 Signif F = .0000

VariablesintheEquation

Variable	B	SE B	Beta	T	Sig T
SBRWN	-427.508933	109.232126	-.314693	-3.914	.0002
N91	-1032.761279	245.093202	-.346424	-4.214	.0001
N92	-851.161681	145.541446	-.496681	-5.848	.0000
N93	-673.022890	117.882630	-.495418	-5.709	.0000
N96	-526.578457	128.441052	-.352878	-4.100	.0001
(Constant)	1985.041920	106.083682		18.712	.0000

Table A3: "Stepwise" Regression The Bay of Plenty Region

Equation Number 1 Dependent Variable.. Sale-ha

Variable(s) Entered on Step Number 6.. DMILL

Multiple R	.69653
R Square	.48515
Adjusted R Square	.40594
Standard Error	994.86511

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	6	36373356.58834	6062226.09806
Residual	39	38600506.51046	989756.57719

F = 6.12497 Signif F = .0001

VariablesintheEquation

Variable	B	SE B	Beta	T	Sig T
D M I L L	40.142708	23.659227	.211460	1.697	.0977
DPORT	-15.266085	6.371067	-.295764	-2.396	.0215
N91	-2740.286800	1014.684440	-.313017	-2.701	.0102
N92	-2013.390973	611.489726	-.389394	-3.293	.0021
N93	-1889.392079	549.847490	-.417007	-3.436	.0014
N94	-794.279721	432.404826	-.223471	-1.837	.0739
(Constant)	3944.967040	994.594788		3.966	.0003

Distinguishing Residential Submarkets with Application to Auckland Data

Vincent S. Peng

ABSTRACT

This research seeks to test, by using data from Auckland, whether a statistical method can construct housing submarkets that are clearly superior to, in the sense of being more homogeneous than, submarkets defined in an *ad hoc* manner. Principal components and cluster analysis are used to construct housing submarkets which are compared with *a priori* submarkets and with the metropolitan-wide housing market. Hedonic analysis is then used to determine whether submarkets exist within the Auckland housing market, and also whether statistically generated submarkets are superior to a *priori* submarkets.

An NZIV Post-graduate Research Paper

BACKGROUND

Given the spatial immobility, stock durability, and heterogeneity of housing, as well as the inelastic demand and supply of housing over a certain period of time, it is unlikely that the housing market is a uniform entity. This is certainly true across metropolitan areas, but is also valid within a metropolitan area. The interaction of inelastic demands for particular types of housing and relatively inelastic supplies may disrupt the equilibrium market conditions in the housing market, and segment the market into a set of fairly independent sectors or submarkets. Houses will be close substitutes within a submarket and poor substitutes across submarkets.

There exists abundant literature on distinguishing housing submarkets. However, an extensive review of the existing literature has identified a number of deficiencies associated with the traditional ways of defining submarkets. Traditionally, submarkets are defined either in spatial or in structural terms. When spatial dimensions are used, housing market segmentation can use pre-existing

geographic or political boundaries (Schnare and Struyk, 1976; Goodman and Kawai, 1982; Adair *et al.,* 1996) or spatial partitions based on socio-economic or environmental characteristics of an area (Schnare, 1980; Galster, 1987; Harsman and Quigley, 1995). Another way of delineating submarkets in spatial terms is offered by Palm (1978). She argues that information constraints and search costs may segment the market into different submarkets, within which it is probable that housing information is exchanged at low costs, and between which little information is available without the investment of relatively more time and effort Similarly, Palm (1976) and Michaels and Smith (1990) investigate submarkets delineated by real estate agents.

The use of structural dimensions to define housing submarkets has been on the basis of the number of rooms (Schnare and Struyk, 1976), lot and floor area (Bajic, 1985) or the type of property, such as detached versus attached (Allen *et al.,* 1995; Adair *et al.,* 1996). In each case, submarkets were distinguished as *apriori,* i.e., they were determined by a prior view of what is important. However, there are questions about the appropriateness and accuracy of submarkets distinguished on a *priori* grounds. Such submarkets as *a priori* may cut across the underlying pattern of segmentation if that pattern is defined by a complex combination of structural and locational attributes that are interactive and non-separable (Schnare and Struyk, 1976; Maclennan and Tu, 1996).

Only a small body of research has attempted to use more systematic methods for defining submarkets, but no study had used a set of techniques in a comprehensive procedure for constructing, testing, and analysing submarkets until recent research by Bourassa *et al.* (1997). However, their study was not able to define submarkets that were consistently better than *a priori* submarkets. Given the fact that their data for Sydney and Melbourne were of relatively poor quality, they concluded that better data could allow statistical construction of submarkets which should be clearly superior to a *priori* submarkets.

Using data from Auckland housing market in 1996 that are of considerably better quality, this research aims to examine whether the approach developed by Bourassa *et al.* can be used to construct submarkets clearly superior to *a priori* submarkets, and whether their method has potential for further development and application.

The novelty of this research is the use of sales transactions data and the incorporation of geographic information system (GIS) derived variables and census data along with housing physical attributes in modelling housing markets. This research contributes to better understanding of the structure of housing markets, and to establishing a framework for defining submarkets with a maximum degree of internal homogeneity and external heterogeneity. Practical applications of this research include the definition of submarkets for computer-aided mass appraisal of properties.

DATA

The data used in this research refer to Valuation New Zealand (VNZ) sales data, census data, and GIS-generated variables. The structural characteristics of housing are drawn from VNZ sales data which contain such information about housing as: exact location, floor size, land area, age, construction material and exterior condition, as well as sale date, sale price and the value of chattels. Dwelling type (attached or detached) can also be derived from the VNZ data.

The census is conducted in New Zealand every five years, and the census data used in this research refer to the 1996 census. Census data provide demographic and socioeconomic characteristics of geographic areas in New Zealand. There are 326 area units (AUs) in the Auckland region. For each AU, such information can be extracted and calculated as: densities of population and dwellings, homeownership rate, median household income, percentage of people receiving income support, average cars per household, average rooms per house, percent of unemployed, and ethnic structure.

With the use of GIS, such locational information on housing can be identified as distance to various locations, including the central business district (CBD), shopping malls, schools, and parks.

The data used in this research are substantially better than those in the study by Bourassa *et al.* in the following respects:

Firstly, the house prices are from actual transactions, while the house prices available to Bourassa *et al.* were just the owners' estimates of the current values of the houses, and those estimates were limited only to owner-occupied dwellings.

Secondly, the data describing the structural characteristics of housing are more detailed in this research than in the study done by Bourassa *et al.*

Thirdly, the demographic and socioeconomic characteristics of housing are more precisely described in this research than in the study done by Bourassa *et al.* These characteristics are available at the AU level in this research rather than at local government area (LGA) level in the study by Bourassa *et al.* The average size of the AUs is 18.12 square kilometres, while the average sizes of the LGAs are 275.12 and 134.73 square kilometres for Sydney and Melbourne, respectively.

Finally, the locational information on housing are identified more accurately in this research than in the study done by Bourassa *et al.* Instead of using the average distances of dwellings in a particular LGAto various locations, this research uses distances of each individual dwelling to various locations, which provides accurate estimates of accessibility for each dwelling. There were 29,553 freehold residential properties sold in the Auckland metropolitan area in 1996, of which 21,695 sales were suitable for the present analysis. The majority of the discarded sales had missing or outlying values for key variables used in the analysis. The balance of the observations were omitted because they could not be geo-coded and thus could not be matched with variables extracted from the census and variables derived from GIS.

METHOD

The method used in this paper is similar to that used by Bourassa *et al.* (1997). Firstly, a hedonic regression is estimated for the overall Auckland housing market. The specification of the hedonic model with respect to the determination of functional form is as important as the quality of data. However, theory provides no definitive answer to the structure of the hedonic model, and the hedonic relationship must be specified from an empirical viewpoint. In this study, model specification also provides the basis for determining the appropriate form of variables to be used in the subsequent principal components analysis (PCA).

In their Australian study, Bourassa *et al.* used the model's fit as a guide in specifying hedonic equations, and the specification was accomplished using an algorithm that selects the variables that jointly result in the highest adjusted R2. This study uses the same guide and finds similarities in terms of the specification of the hedonic model. Experiments with various transformations of the dependent and independent variables indicated that the model could be improved by using the natural logarithms of the sale price, value of chattels, floor size, distance, and median household income measures.

Various transformations of density measures were tested, and it was found that the population density and the square of population density were significant. As the relationship between house value and the age of the dwelling is expected to follow a U-shaped curve (the oldest houses are desirable for their historic character), including both the age of the dwelling and the square of age in the model was also tested, and both were found to be highly significant in the final estimations.

It was also found that a logarithmic transformation could effectively improve the data distribution for the dependent variable, sale price. The skewness of the distribution dropped from 1.63 for sale price to 0.28 for its natural logarithm.

Principal components analysis is used to extract orthogonal factors from the dependent and independent variables. The components that jointly account for at least 80 percent of the variance are retained, and for interpretation purposes, these components are rotated using a

VARIMAX procedure. By VARIMAX rotation, the new principal components and the factor scores calculated on these components remain uncorrelated, which meets the requirement of using only non-collinear variables for cluster analysis. The PCA is also interesting in its own right because it identifies the underlying dimensions that distinguish housing submarkets.

Factor scores are then used in cluster analysis to construct homogeneous submarkets. The number of clusters is set initially to equal the number of *a priori* submarkets, i.e. six. A version of K-means clustering, for which the metric is squared Euclidean distance, is used in this study.

Finally, hedonic regressions are performed fora *priori* submarkets, and for submarkets defined by the cluster analysis. For each submarket, we choose the hedonic regression with the highest adjusted R2. The hedonic equations for the two definitions of submarkets are compared with the hedonic equation for the overall housing market to investigate whether submarkets indeed exist. The variance of the overall market regression is compared with the weighted average of the variances of the equations estimated for each of the submarkets. This test is used in a similar fashion to compare the two definitions of submarkets.

In each case, the ratio of the variances follows an F distribution. A significant F test between two definitions of submarkets indicates that one classification is superior to the other because hedonic models based on that classification fit the data more precisely. In other words, the superior classification defines submarkets that have greater internal homogeneity and external heterogeneity.

RESULTS AND ANALYSIS

Overall Market

Table 1 provides the results for the metropolitan-wide hedonic model. The adjusted RZ is 0.73, which is significantly higher than 0.59 for Sydney and 0.43 for Melbourne in the Australian study done by Bourassa *et al.* (1997). This is probably due simply to the better data from Auckland used in this research. Most variables selected in the model are significant withp-values of less than 0.0001.

Most signs of the coefficients are as expected. For housing physical characteristics, floor size is positively related to sale price, and the sale price of detached houses is higher than that of attached units. The value of chattels contributes positively to sale price. Also, both good exterior condition and superior quality of the principal structure add value to houses, while bad wall condition decreases house value. Although house value gradually decreases with age, older houses with historical vintage have higher values. Thus, it is as expected to find that age is negatively related to total sale price, while age squared has a positive impact.

For housing location characteristics, urban economics provides ready interpretations of the value of a house in terms of its accessibility and its neighbour-hood. According to residential location theory (Alonso, 1964; Muth, 1969), there is a trade-off between access-ibility and consumption of land. In the Alonso-Muth model, the relationship between the income elasticity of demand for space and the income elasticity of commuting costs determines the geographical distribution of households within an urban area. With income elastic space demand and inelastic commuting costs, higher-income households will have much larger lots and only slightly greater commuting costs.

In this case, they will outbid other households at peripheral locations. For US cities, it was assumed that the first elasticity exceeds the second, thus accounting for the location of wealthier households at the periphery and poorer households in the centre. With income inelastic space demand and elastic commuting costs, higher-income households have steeper bid rent curves and should locate centrally - a result that is consistent with observed location patterns in Auckland as well as Sydney and Melbourne.

In a study of San Francisco, Wheaton (1977) found that the income elasticity of demand for space and the income elasticity of commuting costs were approximately the same, which means the residential pattern could not be explained totally by the Alonso-Muth model. He thus

Table 1: Results for metropolitan-wide model

Analysis of variance

R2 0.7293 Adjusted R2 = 0.7290 Root MSE _ 0.21328 n-21695

Parameter estimates

Variable	Estimate	Standard error	P-value
Constant	5.41444	0.22212	0.0001
VNZ data for individual dwellings			
Log of floor size in square meters	0.44210	0.00471	0.0001
Detached dwelling	0.09138	0.00394	0.0001
Log of chattel value	0.02949	0.00082	0.0001
Age of dwelling	-0.00328	0.00024	0.0001
Age of dwelling squared	0.00006	2.30E-06	0.0001
Good condition of the wall	0.02603	0.00369	0.0001
Bad condition of the wall	-0.10348	0.00981	0.0001
Superior quality of the principal structure	0.12045	0.00485	0.0001
Poor quality of the principal structure	-0.03854	0.00593	0.0001
GIS data for individual dwellings			
Log of meter to CBD	-0.07223	0.00446	0.0001
Log of meter to the nearest shopping mall	0.03297	0.00167	0.0001
Log of meter to the nearest primary school	0.00942	0.00219	0.0001
Census data forAUs			
Population density	0.00001	3.48E-06	0.0065
Population density squared	-1.55E-09	0.00E+00	0.0051
Log of median household income	0.47674	0.01891	0.0001
Average number of bedrooms per dwelling	-0.08556	0.01195	0.0001
Percentage of people driving to work	0.01183	0.00200	0.0001
Home ownership rate	-0.01406	0.00204	0.0001
Percentage of people receiving income support	0.01096	0.00052	0.0001
Percentage of Asian	0.00136	0.00028	0.0001
Percentage of Maori	-0.00964	0.00036	0.0001
Percentage of Pacific Islander	-0.00313	0.00027	0.0001

Results for metropolitan-wide hedonic model

suggested that environmental amenity might also be important in explaining residential patterns. Using the Boston area as an example, DiPasquale and Wheaton (1996) demonstrated that locational characteristics, including accessibility to various amenities and neighbourhood quality, can account for more than half or the overall value of a house. Unlike many US cities, large inner-city areas in Auckland have retained their environmental qualities and remain attractive to wealthier households. Therefore, it is not surprising that distance from the CBD is negatively related to sale price.

The distances from the nearest primary school and the distance from the nearest shopping mall are negatively related to sale price, and this could be affected by such negative externalities as traffic congestion and noise. As expected, median household income, percentage Asian, and average number of cars per household are positively related to sale price, while the percentage of unemployed people, and percentages Maori and Pacific Islander are negatively related to sale price. It is found that, in Auckland, home ownership rates ire lower in the more central areas vhere higher value houses are)cated, and this helps to explain ,hy the coefficient of the home wnership rate is negative in the etropolitan-wide hedonic model. Auckland, casual observation ;gests that high value houses located in areas with moderate ,ulation density and lower ue houses in high and low sity areas.

That is, the relationship of house value and density follows an inverse U-shaped curve. Thus, it is as expected to find that the population density is positively related to sale price, while the square of population density is negatively related to sale price.

Two variables have unexpected signs in the model. They are the average number of bedrooms per dwelling, and percentage of people receiving income support. An examination of the correlation matrix reveals that the average number of bedrooms is highly and significantly correlated with the percentage of people driving to work and the home ownership rate. The percentage of people receiving income support is highly and significantly correlated with the logarithm of median household income. The presence of these high correlations is an indication of multicollinearity.

Multicollinearity causes difficulty in interpreting the partial regression coefficients, because these coefficients may have the wrong signs. However, multicollinearity is a data problem, not a problem of model specification. In this study, the model is specified with the aim of maximising the predictive power by achieving the highest adjusted R2, and many times prediction is maximised at the expense of interpretation. In the case where a regression coefficient bears a wrong sign because the corresponding independent variable has a multicollinearity problem, the simple correlation between this independent variable and the dependent variable should be used in understanding their relationship. In the correlation matrix, the average number of bedrooms is positively related to the logarithm of sale price, while the percentage of people receiving income support is negatively related to the logarithm of sale price. The relationships are all very significant withp-values of less than 0.0001.

A Priori Submarkets

Six *a priori* submarkets were defined according to territorial local authority (TLA) boundaries. They are Auckland City, Manukau City, North Shore City, Papakura District, Rodney District, and Waitakere City. Hedonic equations were estimated for these six *a priori* submarkets. The weighted average of variances for these six equations was then calculated and compared with the variance for the metropolitan-wide hedonic equation. It was found that the weighted average of variances for *a priori* submarkets is significantly smaller than that for the overall market equation.

A comparison of parameter estimates for the six *a priori* submarkets equations finds that, not only do significant differences exist in the hedonic prices ofthe individual housing attributes across submarkets, but also the combination ofvariables influencing house values also differs across submarkets. This further confirms that submarkets exist in the Auckland metropolitan area.

Statistically Distinguished Submarkets

Sixteen principal components were retained by the 80 percent total variance criterion. These principal components disclose the underlying dimensions, or factors, that distinguish Auckland residential submarkets. Four variables have high loadings on Factor 1, and they all relate positively to this factor. These variables are home ownership rate, the logarithm of the distance to CBD, percentage of people driving to work, and average number of bedrooms. Therefore, Factor I can be labelled as one of the important dimensions of housing submarkets, the trade-off between accessibility and consumption of land modelled by Alonso (1964) and Muth (1969). Three factors are related to the accessibility of a dwelling to various amenities other than the CBD. Factors 9, 11, and 13 relate positively to the distances to the nearest shopping mall and shop, primary and intermediate schools, and park, respectively.

Three variables have high loadings on Factor 2, and they all relate positively to this factor. They are the percentage of people unemployed, percentage Pacific Islander, and percentage Maori. Thus, Factor 2 is a socioeconomic factor and can be interpreted as an indicator of neighbourhood quality. Factor 5 and factor 16 are also socioeconomic factors, but they are related positively to higher quality neighbourhoods. While Factor 16 relates positively to the average number of cars per household, Factor 5 relates positively to the average number of bedrooms and the logarithm of median household income, but negatively to the percentage of people receiving income support. Factor 6 indicates the population density of a neighbourhood.

Grigsby *et al.* (1987) argued that the trade-off between inner and outer locations is between built-up properties near the centre and undeveloped land at the periphery, and noted that the nature of the housing stock should have an impact on residential location decisions. Factors 3, 4, 7, 8, 10, 12, 14, and 15 all relate to the housing stock. Factor 3 is positively related to good condition ofthe roof and wall, and negatively related to the age of the dwelling. The variables having high loadings on Factor 8 are bad condition of the roof and wall.

Thus, Factor 3 and Factor 8 can be labelled as the condition of the dwelling, with Factor 3 standing for good condition and Factor 8 forbad condition. Factor 4 is related positively to expensive detached houses with large floor size, superior quality of the principal structure, and Factor 15 is related positively to the value of chattels. Factor 14 is related positively to poor quality of the principal structure. Therefore, these three factors jointly describe the style of living provided by the dwelling. Factor 7, 10 and 12 relate to the materials used to build the dwelling. It is very interesting that the strong preference of Asians for brick walls is indicated by the high loadings of both the percentage Asian and the percentage brick walls on Factor 7. The characteristics of the housing stock form an additional dimension of housing submarkets.

After the factors had been retained, factor scores were calculated and used for clustering housing submarkets. Six submarkets were formed using the

Table 2

Cross-tabulation of *a priori* and statistically defined submarkets

A priori submarketsStatistically defined submarkets

According to TLA	1	2	3	4	5	6	Total
Auckland City	234	441	0	341	5,296	206	6,518
ManukauCity	586	106	1	191	5,171	15	6,070
North shore City	95	101	0	69	3,414	74	3,753
Papakura District	159	14	0	44	811	7	1,035
Rodney District	140	28	0	27	878	31	1,104
Waitakere City	103	37	127	51	2,404	493	3,215
Total	1,317	727	128	723	17,974	826	21,695

K-means clustering method. It is found that the weighted variance for the statistically defined submarkets is significantly smaller than that for *a priori* submarkets. This suggests that statistical methods can produce submarkets that are better than submarkets defined in *ad hoc* manner.

As was the case for the *a priori* submarkets, it is found that, in each set of statistically defined submarkets, the significant housing attributes and the parameter estimates for those housing attributes vary across submarkets.

Table 2 shows how membership in the statistically defined submarkets compares with membership in the a priori submarkets. It is clear that the statistically defined submarkets are widely distributed across the a *priori* submarkets, and there is no close relationship between the two classifications of submarkets.

A comparison of the characteristics of the statistically defined submarkets and *a priori* submarkets reveals that the latter tend to be more similar to each other in terms of almost all characteristics. Characteristics like the sale price, age of dwelling, floor size, proportion of detached dwellings, chattel value, dwelling conditions, construction materials, quality of the principal structure, distances to the nearest park and primary school, percentage of people driving to work, density measures, as well as home ownership rate and average number of bedrooms, are all found to be more dissimilar across statistically defined submarkets than across *a priori* submarkets. That is, the statistically defined submarkets have higher internal homogeneity and external heterogeneity than submarkets defined in an *ad hoc* manner.

For the statistically defined submarkets, Submarket 1 is a grouping of dwellings with the lowest value. Most of these are detached and of average conditions, and they are all of poor quality. Dwellings in this submarket are on average the furthest distance from the CBD, and located in areas with the lowest densities of dwellings and population, highest unemployment rate and percentage of people receiving income support, lowest median household income, and the lowest percentage European, but highest percentages Maori and Pacific Islander.

Submarket 2 is a grouping of dwellings with the highest value. Most of these dwellings are attached apartments and units with the smallest average number of bedrooms, located in areas close to the CBD. These areas are of moderate population and dwelling density, with the second highest median household income, lowest home ownership rate, and highest percentages European and Asian, but lowest percentages Maori and Pacific Islander.

Submarket 3 is a grouping of dwellings with large floor size and the highest average number of bedrooms. Many newly built and owner occupied dwellings have been grouped into this submarket. These houses are far from the CBD, located in areas with the highest median household income, lowest unemployment rate and percentage of people receiving income support, highest percentage of people driving to work, and highest dwelling density and population density.

Submarket 4 is a grouping of very old dwellings in bad condition and with the smallest floor size. Most dwellings in this submarket were built with wooden walls and iron roofs. These dwellings are of intermediate distance from the CBD, and located in areas with the second highest unemployment rate and percentage of people receiving income support.

Nearly 83 percent of the dwellings were grouped into submarket 5, indicating that most dwellings in the Auckland region are part of one large submarket, with the balance of dwellings being members of small, specialised submarkets. Submarket 5 contains dwellings with the second highest value and located in moderate density areas with the second lowest unemployment rate and percentage of people receiving income support. Less than one third of dwellings in submarket 5 are attached units and flats. Dwellings grouped in submarket 6 are of intermediate distance from the CBD and sold without any chattels.

To assess the practical significance of the statistically defined submarkets relative to the *a priori* submarkets and the overall market, the differences between sale prices predicted by

the hedonic equations and the actual sale prices were calculated. The averages of the absolute differences were then compared. While subdivision of the overall market into *a priori* submarkets improves predictive accuracy by 12 percent, classification of submarkets using the approach developed by Bourassa *et al.* can improve the predictive accuracy by 20 percent. On average, the statistically defined submarkets reduce the prediction error by $3,200 compared with the relevant *a priori* submarkets, and by $7,900 compared with the Auckland metropolitan area as a single market.

CONCLUSIONS

Applying a set of comprehensive statistical techniques to better data from Auckland, this research shows clearly that statistically defined submarkets are superior to *a priori* submarkets. Principal components analysis was used to extract the information contained in a large set of variables. The uncorrelated principal components were then used in cluster analysis to construct housing submarkets in Auckland. Hedonic regressions were performed for the metropolitan-wide market, *a priori* submarkets, and submarkets formed by cluster analysis. The variances of the hedonic regressions were then compared. It is found that both submarket classifications perform better than the metropolitan-wide market equation, and that hedonic prices vary across submarkets. Moreover, the hedonic regressions for statistically defined submarkets yield results that are significantly better than those for *a priori* submarkets. The research also demonstrates the practical significance, in terms of improving predictive accuracy, of using statistical methods to distinguish housing submarkets.

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IDENTIFYING NON-MARKET PUBLIC AMENITY VALUE USING A VALUES

Patrick Lally

Abstract

Within the past few decades there has evolved a growing concern by policy administrators for greater public input into democratic decision-making processes. This has extended especially into the area of environmental planning. Political trade-offs in this area have for so long involved non-commensurate criteria using numeraires that are largely incompatible. The demand for incorporation of non-market considerations such as `intrinsic'and `existence' values, is driving a need for innovative approaches to be taken in identifying these other forms of value. Non-market valuation methods such as contingent valuation are becoming popular overseas but are received with a degree of scepticism in Australia and NewZealand. The purpose of this paper is to report on the trial of an alternative method, the values jury. The jury process invites members of the public to consider their willingness to trade-off environmental features using a financial scale. Participants in the trial identified a willingness to forgo the benefits of specific local environmental features as long as an appropriate level of compensation was guaranteed to the affected community. Also identified, was the level of public amenity compared to the market value for those features. The trial confirmed the viability of using the jury approach and highlighted some of the major advantages that such an approach may have over alternative non-market valuation methods.

Introduction

We need no economic formula to confirm that some features of our environment' are held in higher regard than others. It is a matter of *values* personal and social rather than *value* that determines our prioritisation. While most of us agree that we should `value' the environment, there is still as yet, no agreement on how that might be best done. Ethicists may argue with economists about the substantiation of value but even within the various economic sub-disciplines including land economics, there remains no widely-accepted method that unambiguously identifies the all-encompassing value of a specific

aspect of the environment.

In most westernised countries political decision-making about natural environmental assets suffered a sea-change in the 1960's. Publications such as Carson's *Silent Spring* (1962) achieved prominence because they brought into question the value-system of a generation of people educated to take Science on trust.

In more recent years the political, judicial and economic systems that surround us have been slowly adapting to these changes in values in an attempt to fairly reflect the evolution of social concern for the environment. New Zealand's Resource Management Act (RMA) came into force in 1991. Under previous legislation which promoted the concept of `beneficial use', decision-makers had to make trade-offs between development and conservation objectives. This approach tended to favour resources being allocated for development purposes (Gow 1997). Under the RMA, constraints on the development process mean that other values including options for future generations, intrinsic and existence values have risen in prominence. These values are probably best amalgamated and termed *public amenity value* for together they are difficult to differentiate and separately there is no proven method that captures their scale.

The elevation of safe minimum standards (SMSs) and environmental impact assessments (EIAs) from mere technical necessities to core requirements in consideration of any significant development, is a further example of substantive change to policy. Most of these demands for more and better details have arisen in only the past decade or so.

Despite the increasing demands for greater technical input, the language of default has remained economic: it is still so much easier to make trade-offs on the basis of cost-benefit analysis where both sides of the equation contain a *numeraire* based on a common financial medium of exchange (dollars, yen, pounds). To trade-off currency as a cost against a benefit of some other numeraire for example, the *number* of frogs saved from death by an evasive action - is difficult. Ideally, decisions should proceed along the path that accrues the greatest net benefit to the impacted community. Admittedly, this pre-supposes that an anthropocentric (human-centred) view will dominate, but even in the case of the frogs, the wish may be for them to be delivered from danger if only for the reason that future generations of humans may have the benefit of witnessing the creatures in their (quasi-) natural environment.

Under most circumstances political decision-making is made more expedient when trade-offs are presented in a common - particularly economic - numeraire. To this end, the fields of environmental, ecological, agricultural and resource economics have dedicated considerable energy in the past few decades to the development of valuation methodologies that adequately capture *value* in the absence of direct market evidence. Practitioners of some sub-disciplines of economics benefit from one major advantage over those of us who identify ourselves as land economists or real estate valuers: they are not subject to the same legislative and judicial constraints and for that reason they have benefited from an academic freedom that our own profession is lacking. Many modem economics texts now refer to the emergent methods of valuation such as contingent valuation' (CV), hedonic pricing and the travel-cost method of valuation3. In a recent survey of real estate valuation practitioners (Lally 1998) it was evident that the level of recognition of these methods was exceedingly low. Of course, it may also be argued that the skills of the real estate valuer are specific, subject to significant legal constraint, and therefore should not be considered appropriate for the determination of other forms of value (see, for example, Whipple 1995).

In the US, the situation is very different. In December 1980, the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) became law. It established liability for *publicly-owned* natural resources arising from the release of contaminants into the environment. Other companion legislation followed and a key

element of it all has been that damage assessment is to be estimated as the necessary costs for the restoration, rehabilitation, replacement or acquisition of equivalent resources plus `compensable value'. Compensable value is defined as the amount of money required to compensate *the public* for the loss in services provided by the injured resources (Bromely 1995).

How are `compensable values' determined? Primarily because these values are non-market derivatives and involve `the public' they can not be determined purely by reference to *the market.* Instead, the focus has shifted to developing novel methods of ascertaining value in the absence of an obvious market. Techniques such as contingent valuation are now becoming *de rigueur* in the education of land economists in the US. This is exemplified by the concentration of non-market value-related papers in the US `Land Economics' journal. Of the 321 papers it published from 1990 to 1997, 16.5% related to contingent valuation or some aspect of non-market value assessment. In the same period there were no such references in the equivalent Australian journal ('The Valuer and Land Economist'). This is not surprising given the lack of legislative or judicial sanctioning of such approaches in Australia. The issue of direct sanctioning is still to be tested in New Zealand but non-market valuation is precisely what is required if, as the RMA highlights, `option', `intrinsic' and `existence' values are to be determined. The New Zealand Institute of Valuers Journal has contained three recent papers relevant to the topic by Weber (1992), Bond (1993) and Dunckely (1995) and although this greatly exceeds the Australian contribution to the topic, it hardly satisfies Trevor Croot's (then editor of the NZ Journal) challenge in his editorial referring to Weber's paper that:

`... the broader concepts of value will continue to play an important role in New Zealand policy decisions. Let us be sure that it is our profession that provides the advice on those wider value concepts in the future'. (emphasis added)

One of the major appeals of Dunckley's paper is that it attempts to quantify what most people already intuitively appreciate. Dunckely presents a `value ranking' scale (1-10) with 1 = fair sale value, and 10 = most internationally significant site with close to zero discount rates *(see table 1).* Unfortunately Dunckley provides little documentary support for his scale but its appeal rests in its elicitation of the obvious: `market value' represents the *minimum* figure upon which to base an assessment of amenity. Particularly where public assets are concerned (or where the asset could be considered to have a social significance), the challenge remains of determining what premium should be. added to market value to fairly reflect the total value of the asset to the public.

	Most significant internationally	10	Purchase at close to zero discount rates, i.e. at a price which represents the full intrinsic value to the vendor	
		9		
	National significance - price paid depends on funding availability	8		
		7		
		6		
Increasing significance		5	Normal negotiation range for a willing purchaser and not so willing vendor	Increasing substitution
		4		
	Least significant areas	3		
		2		
	Substitution option	1	Fair sale value - Market value	

Table 1: Value ranking Source: Dunckley (1995 p 29)

Dunckley (op cit p29) also raises the issue of social discount rates. Most economists are familiar with discounting future cashflows to generate a net present value (NPV). The discounted cashflow (DCF) technique relies on identifying a specific discount rate that generally relates to the level of an alternative investment (eg. government bond rates). Public amenity is not so easily defined in terms of a discount rate and in fact, as indicated in table 1, the discount figure if it can be established at all is more likely to be closer to zero than the government bond rate.

It is precisely because reference to an objective, accessible data stream is almost impossible when non-market assessment is required that the methods associated with its determination receive considerable criticism. In possibly the best-known attempt to identify non-market value in Australia, the (now disbanded) Resource Assessment Commission undertook the task `to assess the environmental and cultural values' of the Kakadu Conservation Zone (KCZ). The KCZ is an area of approximately 50km2 on the edge of the 20,000km2 Kakadu National Park. The method used to determine value was a major national contingent valuation survey (Imber, Stevenson and Wilks 1991 p 1). Although the report was heavily criticised (Brunton 1991, Stone 1991 a, 1991 b, Moran 1991) it did represent the first substantive attempt to incorporate non-market values into the consideration of whether a major mining venture should proceed. The study was undertaken at a time when mining in the Kakadu region was a major issue on the Australian political landscape. The mining project was eventually abandoned. This was not as a direct result of the findings of the contingent valuation report. It was primarily due to the recognition of the cultural and religious significance of the area to its traditional aboriginal owners (Cox and Waring 1992).

The Kakadu survey broke new ground in the assessment of non-market value in Australia but it did not succeed in legitimising the method. Instead, contingent valuation - and its variants including contingent ranking and contingent rating have remained somewhat relegated to academic economic research; this is despite the encouragement of the Commonwealth Department of Environment Sport and Territories and its publication of support handbooks4.

In New Zealand, Vadnjal and O'Connor (1994) undertook a similar CV study on Aucklander's view of the non-market value of Rangitoto Island. They concluded that the format gave respondents plenty of opportunity to register their protest vote, but provided the researchers with limited economic data.

Despite the broader acceptance of CV in the US and to a lesser extent in Europe, the technique has remained under a cloud of mistrust in Australia and New Zealand. Many policy advisers remain sceptical. To an extent, this may relate to a suspicion that circumstances prevailing in this part of the world are somewhat different from those prevailing in either the US or Europe (Bennet and Carter 1993). An impasse has therefore emerged. Two remedies are apparent: continue to refine CV and improve its attractiveness or develop new techniques to complement/replace it.

The objective of this paper is to describe an alternative, novel method of environmental valuation and to consider the results of a research project undertaken to test its applicability.

Values jury

The scepticism that surrounds the use of non-market hypothetical valuations relates largely to perceived biases in the questioning technique. In essence CV, in particular, is based on what respondents indicate they would do in certain hypothetical circumstances and this has led to considerable controversy. Numerous types of potential biases have been expressed regarding CV in the non-market literature, including:

- Strategic bias, where respondents, perceiving an opportunity to influence policy outcomes, deliberately misrepresent their preferences.

- Hypothetical bias, where respondents believe that the questioning is hypothetical and of little or no use, and so not worth careful consideration.

> `Warm-glow' bias, where respondents gain enjoyment from the process of offering to pay for a `good cause' rather than as a means of identifying the value of the good or service in question (Bennet, Blarney and Morrison 1997).

In an attempt to overcome these, the CV technique is constantly being refined and alternative methods encouraged. The *Values Jury* is one alternative proposed by Brown, Peterson and Tonn (1995).

Paralleling the growth in concern for the environment since the 1960's has been the demand for greater social input into political decision-making. There is now a range of models widely used for incorporating the views of the public into the decision-making process. These include opinion polls and surveys, focus groups, referendums and public meetings. A more recent development has been that of citizens juries. These juries are drawn from the affected public (the group most likely to be impacted by the decision being considered) and each participant acts in their capacity as an ordinary citizen. The jury generally considers an important question about policy or planning and often over a period of several days, is provided with the case for and against to enable jurors to come to a consensus over the most appropriate course of action. Compared with other models, citizen's juries offer a unique combination of information, time, scrutiny, deliberation and independence (Coote and Lenaghan 1997).

Values juries are an extension of the citizen's jury concept. There are two potential roles of values juries: to assist in the selection of a course of action, such as a land management alternative, and to recommend a magnitude of value. Brown, Peterson and Tonn (op cit p253) suggest that values juries may be particularly useful where measures of assigned values (such as CV estimates of monetary value) fail to adequately reflect the held, symbolic, or public amenity value at issue. Unlike the cost-benefit approach to valuation, which maintains a strict distinction between equity and efficiency, the values jury may simultaneously address both concerns.

Jury members can be instructed to act as agents for the community. In this sense the juror is asked to assume the representative role of a *citizen* and to set aside as far as possible his or her *consumer* bias. The jury process also overcomes one of the major problems with many other forms of public participation in decision-making. Specifically, its random selection could avoid the potential problem of undue influence being exerted by special interest groups.

The problem of scale arises in the values jury approach. CV studies generally rely on a relatively large group of participants to provide information for interpretation by the researchers. In the Kakadu study, for example, over 2500 people participated nationally. In fact, the findings of an expert panel constituted specifically to establish guidelines for CV work recommended a minimum sample size of 1 000 for results to be considered valid (Arrow et al 1993). The values jury approach is likely to be more able to contend with localised issues simply because of its scale. It is therefore unlikely to replace CV analysis, but may act as its locally-focussed alternative using statistically valid jury sizes.

Adherents to the CV approach may criticise the jury process because its findings do not represent those of an efficient marketplace. Traditional economic theory contends that an efficient market - and therefore fairly established pricing mechanisms - exist only when consumer preferences are completely evident. The jury system uses a proxy system akin to the Delphi technique to determine value and asks participants to consider their responses as representatives of the impacted community. Under these circumstances, *consumer preferences* become *citizen preferences,* and *value* becomes a reflection of the true public amenity of the feature, inclusive of market value.

The report's authors (Brown 1997 pers. comm., and Tonn 1997 pers. comm.) confirmed that although they had floated the concept of values juries, they had not actually conducted any substantial trials. Neither, to their knowledge, had anyone else. On

this basis a trial of the values jury was undertaken in a regional city in central New South Wales.

The study

Dubbo is a major regional city in central NSW, located approximately 400km NNW of Sydney. Its administrative area extends to 3321 km2. It has a European history dating back to the 1840's and evidence of aboriginal settlement perhaps as old as 40 000 years (Grounds 1984). The city is the site of major health, administrative and tourist facilities with a population of 38 000 people. Approximately 25 200 of these are adults over the age of 18. Around 32 000 of its inhabitants reside within 5 km of the city centre and the remainder live on rural properties or in satellite villages. Dubbo is geographically isolated from other major urban and regional centres and was considered to be an ideal location to test the values jury concept.

An invitation for adult participation (one per family) was posted to a 5% sample of the city's 5 200 private phone subscribers. A z-score analysis showed that a minimum of 24 jurors would be necessary to represent a 66% majority (at a 90% confidence level) of the opinions of the city's adult population. Ultimately 26 members of the community responded and attended an evening session for which each was paid an honorarium of $20.

To provide relativity, the whole jury process was repeated with a stratified sample of 25 invited participants who publicly identified themselves as `environmentalists'. It was on the suspicion that the environmental group would provide an extreme set of values that they were constituted into a separate group. Using this group as a `control' it was possible to determine the extent to which ordinary citizen's values - identified by the randomly selected jury reflected an environmental ethic when challenged with the potential loss of public amenity. Each of these people either participates in a Dubbo environmental action group or work in positions where environmental sensitivity is required.

Participants were shown a series of colour slides of seven sites/ locations within the greater city boundaries. Each of the sites held at least one physical feature that was considered to provide it with public amenity. The hypothetical situation presented about each of these involved either the destruction, removal or re-development of the feature. None of the sites was actually affected by any controversial developments and no formal plans were with Council to proceed with any changes to existing uses. The sites ranged from a single urban allotment containing a derelict - albeit, historic - piece of machinery, through to an early European settlers' cemetery, and from a 3 500ha forest reserve to a pioneer cottage (refer table 2). The sites were selected to reflect as far as possible, a range of environmental features with which the Dubbo public were likely to have some affinity.

Participants were asked to identify their degree of familiarity with each site (on a Likert-type scale 0-5) prior to indicating their value assessment. This could be used to determine how much additional background information may need to be prepared if the study were to be repeated with a different set of jurors. Low levels of familiarity may indicate a need for important information about a site to be shared with the jury prior to proceeding with the exercise. Jury facilitators should be wary, as they may leave themselves open to the criticism of `coaching' if they do not present this information in an even-handed manner.

Many CV surveys report a strong tendency for respondents to register `protest votes', either in the form of nominating exceptionally high values, or by refraining from providing any answer to a particular scenario. To avoid this, the response documents used in the trial also contained a space for participant's comments. This was to encourage them to express any adverse feelings toward the proposed development events for each site in words, as a means of limiting the potential for collection of unusable numeric responses.

The jury was shown each of the locations separately and evidence of current market values presented. Jurors were asked to identify what they considered to

be the true value of the site. Under the conditions of the trial, any premium above market value (excluding disturbance costs) equates to the public amenity value. For each property the jurors were asked to identify the value that the Dubbo community would lose if the proposed hypothetical development proceeded. As an aid to their thinking, it was suggested that they consider how much it would cost to build or acquire an alternative facility that would adequately compensate for the loss of amenity caused by the development of the existing site. They were encouraged to approach this not from the point of view of full replacement - a historic building can never be replaced but instead with a view that the loss could be compensated by the provision of some alternative public facility such as a baby health centre, swimming pool or dedication of parkland. Additionally, for three of the sites the jury was asked to nominate how much they would be prepared to pay as individuals to retain the site in its present state. This is similar to the CV willingness-to-pay format. Where this question was used, a following one asked how much the jury members would recommend every adult in the city be levied each year to ensure that those sites remained unaltered in perpetuity (refer table 2). The payment vehicle was to be an impost on the local government annual rates. The response to these questions would enable a social discount rate to be revealed.

Under circumstances where an element of non-market value is considered to exist, most texts *(see,* for example, Pearce 1993) construct total value on the following basis:

$$TEV = UV + NUV$$
$$=(DV+IV+OV)+NUV$$

Where TEV is total economic value, UV is use value, NUV is non-use value (including `existence' and `intrinsic' value), DV is direct use value reflecting the value of specific production from the site, IV is indirect value which may include ecological functioning such as watershed protection, and OV is option use value reflecting an actual or potential future capacity to produce DV or IV. Market value or one of its variants is normally the basis for calculating UV. The contingent valuation method is most commonly used to determine the magnitude of NUV. CV primarily ascertains individuals willingness-to-pay to avoid a hypothetical change to some environmental feature, determines a central tendency, and then projects the figure over a predetermined population. The values jury can also be used to estimate NUV. In the Dubbo trial jurors were asked to nominate a value for each site that reflected TEV. Market value was known and identified to the jury as part of the introduction to each site. The critical difference between the CV approach and that of the values jury is that it was not the jurors willingness-to-pay that was in question. Instead, it was their estimation of the magnitude of offsetting compensation that was critical in determining public amenity value. This is considered to be a fairer reflection of the NUV resulting in a more appropriate TEV calculation. For example, jurors were asked to nominate the total amount a developer should be charged to have unfettered right to acquire a historic one hectare cemetery so as to construct a residential dwelling on it. Jurors were given estimated costs of removing and relocating the graves. In this case the jury members were instructed to derive their total value figure on the basis of market value (based on sales of nearby land parcels), plus disturbance costs (relocation costs), plus public amenity value. The independent unknown in each case was the influence of the public amenity value; the equivalent of NUV.

Aboriginal sacred sites were not included in the project as these were considered beyond any realm of value that might incorporate an economic medium of exchange.

With market value identified as a baseline for each site and a strong suspicion that the figures provided by the environmental jury would constitute a `ceiling' on values, it was then possible to establish where the community jury participants fell in relation to these two extremes.

To avoid the unintended effect of extreme outliers, median figures were used to determine values in the study results.

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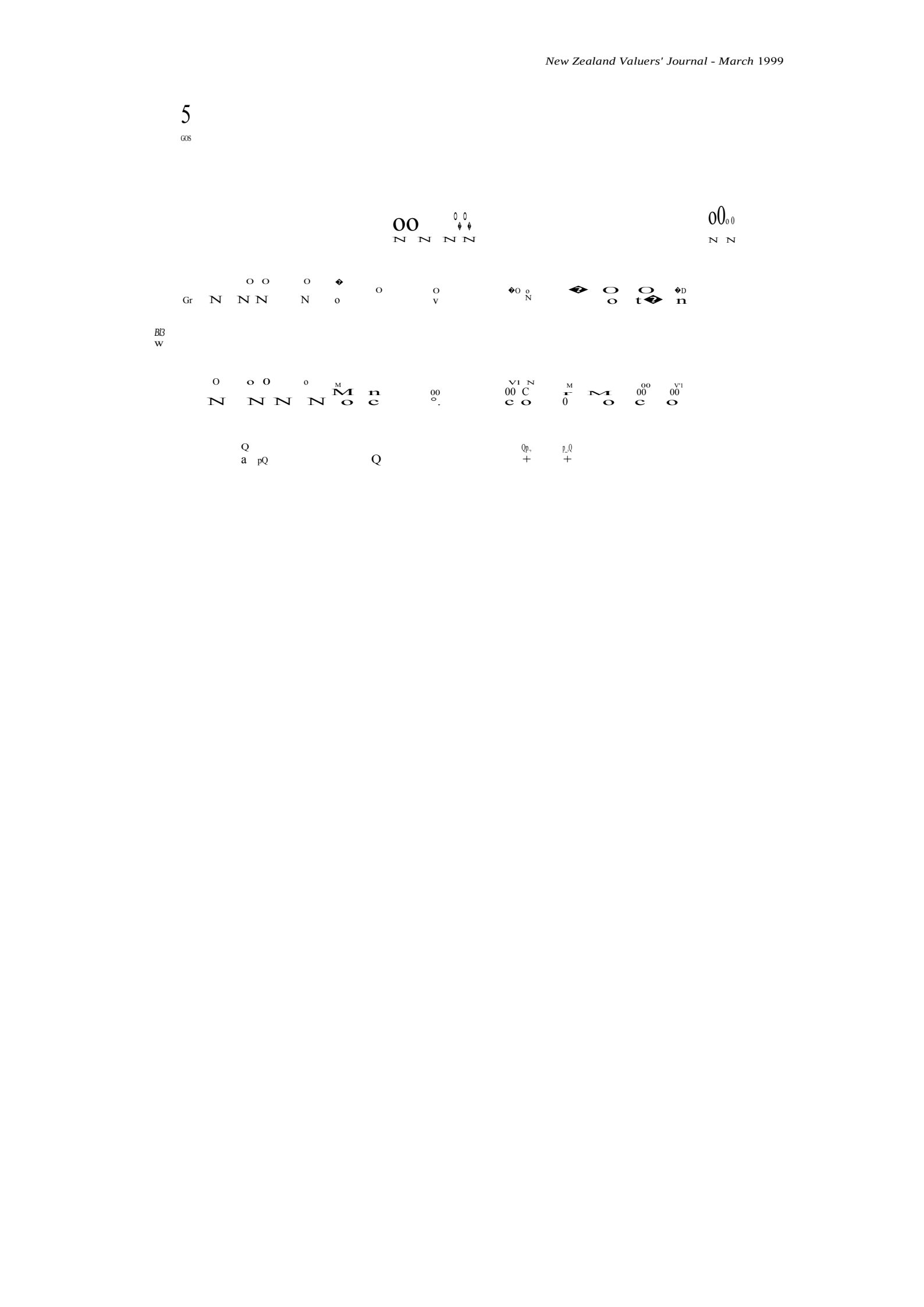

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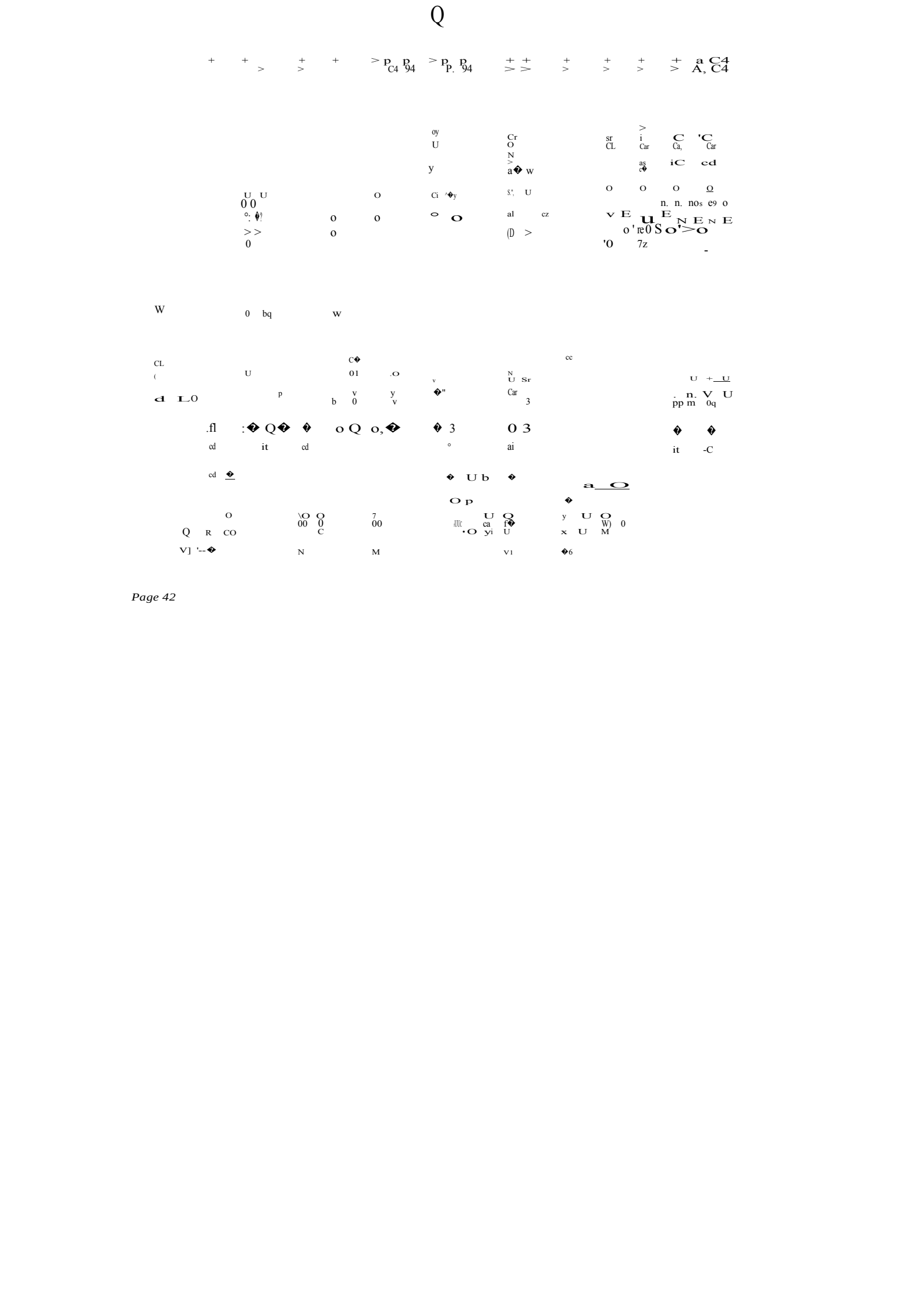

Results and discussion

Results of the trial are included in table 2. The important points to emerge from these results are:

- On almost all sites, jury members confirmed mean levels of familiarity in the range of 2.65 3.96 (scale 0-5): a moderate-to-high level, indicating that much of the general background information about each site could be dispensed with. The one exception was the remote war memorial location, of which most jurors were totally unaware.

  Jury members identified a zero social amenity premium over market value (MV) for sites with high levels of substitution (for example, vacant allotments) or where significant features on those sites could be relocated without damage.

- For significant sites that were not under any immediate threat of destruction or disturbance - restrictions already exist to limit this - then MV was considered an adequate reflection of total social concern. That is, the jury was satisfied that in some cases existing statutory controls adequately compensate for a threat to the loss of public amenity. For example, no public amenity (PA) premium was placed on the 1860's house on the understanding that any potential buyer would simply enjoy the right to live in it without holding a right to cause damage to its character. Heritage restrictions and local government measures were assumed to adequately limit an owner's ability to impact on the character of the site. The jury identified a 50% PA premium over MV when the owners hypothetical intention to demolish the structure was exposed.

  The level of PA over MV was not an adequate indication in itself of the level of public concern for a site where relatively high disturbance costs exist. In the case of the remote war memorial, the PA above MV was expressed as a factor of 4. This might otherwise indicate a very high affinity for the site but when the premium is considered in comparison to the total costs that the developer would bear, the PA figure is reduced to a factor of 0.08. This indicates that the jury members identified only a very marginal social amenity is transferred to the Dubbo community by the continued existence of such a feature in its remote location. In other words, as far as Dubbo residents are concerned, only 8% of the memorial's total value could be claimed to be non-market related.

  The purpose of including the remote site in the study was to determine to what extent public attachment transfers over longer distances. A similar war memorial site, located in Dubbo, was shown to the jurors for their determination of value, and is commented on below.

- In the case of the CBD park, 85% of its total value was associated with its public amenity. The jury determined that its total value was 5.67 x MV.

- Although jurors identified only a modest amount of public amenity for the remote war memorial, they identified a very strong attachment to the local war memorial. They demonstrated that a developer would have to pay a figure of 20 x MV to acquire the site and that 92% of its total value is constituted by its PA component.

  Similarly, the jury placed a high premium on the relocation of historic gravesites away from their present location. A developer would have to pay at least 10.43 x MV to acquire unfettered rights to the site.

- The 3 500ha forest block attracted little social amenity (particularly as it represented only a small portion of the 62 000ha forest that it is attached to) until its ecological significance was revealed. It, PA rose from 3% of total value to 88% when the rarity of its wildlife and threat to certair species likely to be caused by its loss was revealed. As at undifferentiated forest block

its total value was also considered to be only 3% above MV but as a sanctuary for threatened species this figure rose to 700%. A similar response was generated when it was revealed to the jurors that the location also contained (non-sacred) aboriginal ochre pits.

- For several of the sites, jury members were asked to recommend perpetual annual amounts to be levied on all 25 200 adult members of the Dubbo community - nominated as PPD in the results so as to maintain the properties without threat of destruction. Using such a device is one way of revealing a social discount rate. The rate is equivalent to that degree to which the total site value is discounted back to the gross PPD per annum. In the case of the 1840's homestead, the jury recommended a $2.00 per annum levy ($50,400 pa for the total city population) which equates to a relatively high discount rate of 10.1%. For the remote war memorial, the recommendation of zero PPD indicates that no meaningful rate exists and that Dubbo residents are unlikely to consider the site of any significance to them. In contrast to the 1840's homestead, the retention of the 3 500ha ecologically significant forest reserve was considered exceptionally important with a discount rate of only 0.24% applying: a figure very close to Dunckley's "approaching zero discount" for sites with very high public amenity value.

By contrasting the results of the community values jury with those of the `environmentalists' jury several important points emerge:

For sites with high levels of substitution there was no difference evident in the values identified by either group. So, for example, the environmentalists were just as content to have the historic boiler or the aboriginal axe grinding stone removed from a site if it could be done without damage.

The environmental group tended to place substantially higher values on natural sites - in particular, the forest reserve - and somewhat lower ones on iconic man-made features such as the local war memorial.

To the questions asking how much the jury members were personally prepared to donate in perpetuity to preserve a site (PP), the community jury group offered donations that were similar to those that they recommended for *all* of the adult community members (PPD). The environmental group offered considerably more. With the exception of the remote war memorial, the environmental group offered to pay 5-fold more ($10.00 per annum) than the community jury but made exactly the same recommendation as to the amount that the adult members of the city should be levied ($2.00 p.a. for both sites). In the case of the remote war memorial, the environmental jury offered no advance on the zero figure nominated by the community jury.

Conclusions

The Values Jury model represents an attempt to integrate the values, concerns and social preferences of the impacted public into a procedural framework that enables the generation of consensual policy or planning suggestions. It is an alternative source of public value judgements that can potentially avoid some of the problems associated with other sources of this information. In particular, its random selection can avoid the contentious issue of undue influence being exerted by interest groups.

The values jury approach is a useful method of determining the non-market value of an environmental feature by elicitation of the stated preferences of the participants. As a stated preference technique it joins with CV in attempting to reflect the level of social concern for a feature but it also represents an advance in several ways:

- CV is prone to abuse. The technique is complex and must be addressed in the knowledge of its complexity

(Bennet, Blarney and Morrison 1997, p48). The values jury procedure is considerably simpler, and may overcome at least some of the biases associated with CV.

The values jury format allows participants to be presented with sufficient detail to construct an informed opinion on the issue. CV studies often rely on mail-out surveys which present scant detail, or personal interviews using interviewers who are not fully informed on the topic.

- Jurors can be instructed to act as agents for the public - *citizens* rather than assume the role of mere *consumers*. In this capacity they can be encouraged to consider much broader implications than just those impacting in the local and/or present context.

- The jury decision rule can be statistically refined to comply with decision-makers requirements. In this study the minimum jury size of 24 participants was adequate to derive a 66% majority, at 90% confidence level, for a population of 25 200 (adult) people.

- Juries can be formed relatively easily by firstly defining the likely bounds of the `impacted public' and then randomly selecting jurors from amongst that group. In this way juries can be formed as often as is necessary. The results of the public jury deliberation may also be compared against some other stratified sample group of perhaps experts or specially selected members of the public.

The jury can be an important source of public feedback on the concerns held by the impacted community. Whereas CV has difficulty dealing with `protest votes', the jury process may actually be used to encourage the airing of concerns. At this level it can become a significant tool for not only deciding on the magnitude of value as a reflection of social concern but also aid in the selection of a course of action.

The Dubbo values jury study confirmed several important points about public amenity and its quantification using monetary units:

Dunckley's value ranking scale appears to have merit. The jury process confirmed that a scale of magnitude can be attached to environmentally sensitive features that is inclusive of a non-market value component. Whether the scale can then be used on a benefit transfer basis (that is, transferable to other locations and events) will only be revealed with considerably more research of the jury process.

- The continuing issue of economists attempting to derive social discount rates may be at least partially resolved by the jury process. The total value figures derived by the jury represent the present value of all future notional cashflows associated with the feature. In asking jurors to provide a total value (incorporating a public amenity value in addition to market value) and a recommendation of a leviable amount payable in perpetuity by the impacted public to retain the feature, the discount rate can be revealed. Importantly, it appears that not all sites attract the same discount rate. Despite it having a relatively high value ranking, the 1840's homestead attracted only a modest donation strategy resulting in a relatively high (10.1%) social discount rate.

It should be noted that donation strategies are likely to be very sensitive to the budgetary constraints of the donating party. This is also an inherent problem with WTP CV studies. The jury's recommendation of $2.00 per adult per annum to retain both the 1840's homestead and the 3 500ha forest reserve may imply that donors are willing to dispense with $2.00 for any reasonable cause. On this basis, the jury process may be subject to a claim of `warm glow' bias. Further

refinement of the process may assist in overcoming this issue.

- Jury selection criteria are important in ensuring a fair representation of the community in the jury composition. Demographic details of the trial jury participants suggests that older - possibly retired - people are more likely to participate and that males may accept the role of jurors more often than females. The purest selection criterion is conscription but the jury process is unlikely to benefit from the presence of unwilling participants.

- Localised issues are likely to receive a fairer hearing with jurors more informed by their own pre-existing knowledge than may be the case for more distant ones. It is also likely that the impacted public can be better defined on a local scale.

The values jury study was inspired by a continuing critique of CV and associated non-market valuation methods. Not only does the values jury appear to satisfy the demands of administrators for a greater level of sophistication in determining the relative value of social trade-offs, it can also provide a forum for a feedback mechanism to political decision-makers. In mass society, direct democracy public input into almost every political decision - is not possible. But the values jury approach offers a viable solution to the needs of the public who appreciate their preferences being communicated to policy makers and at the same time overcomes the problems of using non-monetary terms to express those preferences.

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Endnotes

1. Although the opening remarks infer that the `environment' equates to the `natural environment', the comments can be equally applied to the historic, scientific, cultural, social, archaeological or architectural environment.

2. Contingent valuation uses a survey of members of the public to determine value. It presents a hypothetical situation associated with a particular feature of the environment and asks how much respondents would be willing to pay (WTP) or willing to accept (WTA) to avoid the action proceeding. The range of answers is obviously contingent on the hypothetical situation presented.

3. The Australian Department of Environment Sport and Territories booklet "Techniques to value environmental resources" (1995) is a very useful guide to various non-market valuation methods.

4. Ibid.

5. It was assumed in each case that no legal or statutory restriction existed which might otherwise limit the determination of market value. So, for example, any heritage listing obligations affecting the properties with historic significance were disregarded in this exercise.

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An Inquiry Into The Origins Of The Glasgow Lease

Marcus Jackson

Introduction

There are numerous examples of ground or land leases throughout the world. This paper focuses on the origins of the ground lease most commonly found in New Zealand the 21 year perpetually renewable ground lease with either 7 or 21 year rental reviews. These leases are colloquially known as `Glasgow' leases.

Glasgow leases are primarily utilised by larger non-profit organisations, such as religious, educational and municipal bodies and have contributed to a significant share of their revenue since the colonisation of New Zealand in the mid 1800's.

One key feature that distinguishes the Glasgow lease is the explicit creation of a formalised `lessee's interest' in the land. This interest recognises amongst other things, the transfer of exclusive use rights from the owner to the tenant over the perpetual term of the lease. The remaining freehold ownership rights, not transferred, comprise the `lessors interest'. A full explanation of the terms and conditions of these leases together with a contemporary overview can be found in various written articles and theses including `Ground Leases - A National and International Perspective'

From a valuation perspective the `lessees interest' has always been a contentious issue with no real consistency among the New Zealand valuation profession. A recent Masters dissertation noted that since the 1950s, no less than 6 different methods have been used in the assessment of the lessees interest, with no clear preferred methodology emerging.

The inconsistencies in identifying and quantifying the interest has been a contributing factor behind some larger leasehold owning institutions failing to formally recognise the lessees interest and insisting, for example, on any free-holding by purchase of the lessors interest, at the full freehold value of the land. In other instances a fixed lessors interest is insisted on regardless of the economics of the marketplace. Contemporary valuation practice also appears to be leaning towards the relegation of the lessees interest to merely the residual sum of the freehold value and the calculated lessors interest. This valuation philosophy places a monetary-cap on the lessee's interest in favour

of the lessors and assumes the lease was designed, first and foremost, to create a lessors rather than the lessees interest.

If we are to attempt to resolve this issue before any contemporary and possibly erroneous valuation concepts are set in statutorial stone, we must firstly come to grips with the history and origins of the leases themselves. This type of lease did not originate in New Zealand and earlier versions have been common overseas for centuries. Over time these leases have provided a low risk and productive investment for the owner of the land. However, the majority of their value was always seen as secured in the hands of the tenants themselves.

There are seemingly, two possible explanations for the origins of the Glasgow lease in New Zealand:

1. The traditional land tenure system of Scotland Feuing; or
2. The customary English land tenure of an estate for life or lives.

It is worth noting here that both Greek and Roman law also recognised the practice of granting ground leases in perpetuity, the Greeks called this `Emphyteusis'. The Romans named the practice `Superficies' and the ground rent a `solarium'.

The following is a very focused look at the development of the two tenures. I should also note here that I am not an historian by trade and I apologise for any unintentional leaps of historical faith.

The Traditional Land Tenure of Scotland - Feuing

As a land tenure system, feuing is noted as unique to Scotland. It developed out of the old feudal tenure of feu-ferm by which land was held in return for non-military service or payments of money in kind. The setting of church property in feu-ferm can be traced back to the 131 and 14" centuries.

In the classical feuing process, the feudal owner surrendered direct control over his land in perpetuity and was typically compensated by an initial sum (or `grassum') and a fixed rent income. In practice, the level of surrendered control varied dramatically depending upon the feudal owner, clan chiefs were particularly prone to infringements. The tenure and practice was formalised in the Feu Ferme Act of 1458 which specifically allowed for the perpetual nature of the estate.

An exert from a feu ferme charter granted in the 1511 century states:

"That from the assured hope to them and their heirs of enjoying and holding a tenure in perpetuity and some reasonable advantages in the increase of "improvement" would accrue"

As the feuing movement developed during the 151 and 161 centuries, high Papal and royal taxation requirements, forced the church to became increasingly involved. In 1533 monks in Kelso received from a fuear an initial lump sum of £1,550 (the lessees interest) together with an undertaking to pay an annual fixed (in perpetuity) feu duty of £82.0 plus a fine of £82.0 on succession of his heirs for the perpetual use of the land.

Written feu ferme grants gave security of tenure to the tenants and were a negotiable and tradable asset in their hands. It was stated that by 1746 virtually all land owned in Scotland was held in feu ferme. Religious and educational institutions also purchased the feu duties as investments.

There is little information on whether these feu ferm tenures evolved over time and although a perpetual right of renewal was evident, no mention has been made of any equivalency or transition towards 7 or 21 year terms. In fact, it is noted that the most common long term lease in Scotland during the 171 and 181 centuries was the 19 year `tack'. JA Haythorn-thwaite's commentary on the Select Committee inquiry into urban Town Holdings during 1892 also noted that:

"the (Scottish) *system under which building land was held differed from the English system. Building leases were very rare in Scotland. Instead, the feu system was prevalent in most Scottish towns, by which land was granted in perpetuity in return for an annual sum of a fixed amount"*

There is also the question, put forward by John Macpherson (FNZIV) of Dunedin, as to whether the Scottish feuing concept in legal terms could have even been transferred at all to the English legal notion of a leasehold estate.

The Customary English Land Tenure of an Estate for Life or Lives

Customary estates for life or lives were common in England as far back as the 10th and 11th centuries. In general terms the estate was based on the granting of exclusive use rights over certain lands for a time period dependant on the lives of nominated persons. A tenancy for 3 lives, the most common, in theory terminated at the end of the life of the last nominated person.

The tenancy for life or lives was a common feature of the `manorial' land tenure system (that is, based on the large rural holding or manor) which prevailed in England up until the 14th century. Other customary tenancies included estates in inheritance, for a term of years and at will. Customary estates had little contractual security and were essentially dependant upon the customs and traditions of the manor and lord. Tenants ranged from serfs to nobles and rentals were usually `in kind' that is either labour, goods or services.

The church was particularly prominent in issuing estates for years and lives to nobles for future favours and/or services.

The tenancy could be granted either privately or sold through a system of public auction. The purchaser was required to maintain the property and could also re-sell or sub-let the estate. Over time an annual money rent (termed variously the reserved rent, lord's rent, chief rent or head rent, etc depending on the district) superseded the `in-kind' rental obligation. The monetary amount however was normally fixed over the period of the tenancy and soon became nominal.

In addition to this moderate and nominal rental, a monetary (or like) `fine' was payable to the landlord on the fall of every life. The fine was the major source of revenue to the landlord and in exchange the existing lessee was able to renew the lost life with another nominated person. The three-life estate therefore was able to be renewed indefinitely by payment of the fine on a rolling, life to life, basis.

This `customary' environment however changed from around the late 14th century onwards and although reasons for the change vary, it was certainly associated with an increasing `economic' perspective on land use generally. This new economic perspective (and especially when combined with the price inflation pressures of the late 15th and early 16th centuries) resulted in an increasing awareness amongst landlords of the economic surplus to be gained with a fixed term lease at a rack rent as opposed to the earlier customary life leases and estates. It also highlighted the considerable and increasing interest the tenant was gaining in the landlord's estate during these inflationary times.

Landlord attitudes towards the management of their estates varied throughout England, however, the traditional customary leasehold tenure was progressively modified through:

- the introduction of fixed term `contractual' leases;
- the conversion and substitution of existing leases for lives for leases for years; and
- the substitution of rack rents in place of fines.

The introduction of fixed term contractual leases, typically of a written format and involving a money rent, immediately allowed the landlord the economic luxury of reviewing the rental and/or renewing the lease to market. It also afforded the tenants increased security of a written tenure without the requirement of providing for and paying the large initial lump sum fine. Initially these leases had terms of a shorter duration of around 3-9 years however soon increased to longer terms of 20, 30, 40 and even 60 years.

The new contractual leaseholds were to some extent forced on the landlords by unfortunate natural occurrences such as the great famines of 1315 - 1317 and the black death plague of 1349. These natural disasters had the effect of dramatically reducing the number

of available tenant/farmers and as such landlords were compelled to offer more attractive and secure lease terms in order to encourage the remaining tenants onto their land.

The adoption of fixed term contractual leases, however, was not always possible where customary and contractual tenancies for lives already existed. Over the following centuries, therefore the conversion of these tenancies to an equivalent term of years was encouraged. The initial basis was a general reckoning that 3 lives, on average, were equivalent to a term of 21 years.

The apparent equivalency in the two tenures was certainly evident in early statutes. In 1571, for example, a Statute was enacted in an attempt to stop the ruin and decay of the old ecclesiastical estates by declaring void all long term ecclesiastical and college leases:

"other then for the tearme of one and twenty yeres or three lyves from the tyme as any such lease or graunt shalbe made or graunted, whereupon thaccustomed yerely rent or more shalbe reserved and payable yerely during the sayd tearme."

The equivalency was also incorporated into general rules of thumb for valuation purposes, for example:

"Men would normally pay for a given income the number ofyears for which they and their near posterity might expect to enjoy it. This was,... the number of years which a grandfather, father and child, all being alive together, may be thought to live,...And since three lives were commonly esteemed equal to twenty-one years, the value of land was about the same number of years 'purchase.

It is reasonable to assume that during the earlier transition period each life, on average, must have been reckoned to be equivalent to seven years. In 1663 a manual was published noting that 3 lives were now equivalent to 33 years and at the very lowest reckoning 27 years.

Unfortunately, the ability of the landlords to not only transform leases for lives into lease for years but also convert the lump-sum fines to increasing annual rack rents, had to overcome considerable practical and financial difficulties. Inmost cases the conversion could only be achieved by allowing the life leases to fall in (that is, not renewing any of the fallen lives). This meant the tenant (who would normally have at least 2 further lives remaining) had a reduced incentive to care and improve the land over the remaining term and certainly towards the end of the lease. Furthermore, and more importantly, as no lives were renewed the landlords also lost their main source of revenue, the fine, over the remaining term.

Leasehold estates over time therefore varied from the old customary tenures still in existence through to newly developed written contractual leases for terms of years. Various combinations of the two were also evident. For example, in 1626 a truly perpetual 21 year lease was granted, allowing for payment of a fine and also incorporating a service obligation. The grant allowed a:

"lease for 21 years, and so from 21 years to 21 years for ever, paying only three years' fine, at the most, for renewing the lease for 21 years as aforesaid; and, in consideration thereof the said tenants to continue the performance of their ancient and accustomed service in the wars, with horse, man and furniture, upon the boarders and marches of England towards Scotland, for the space of 15 days, without wages, .. .

The Commissioners who reviewed this lease in 1649 specifically commented that the *"tenants' right or trust"* in this type of lease was very considerable indeed.

Existing leases for lives were still evident during the early 18' and 19`' centuries in England and generally remained renewable at the customary discretion of the landlord. Very few new leases for lives (or longer term leases for years) were being entered into however, as their long term productive advantages were seen as outweighed by short term financial disadvantages - primarily the result of the fixed rent/fine structure. Short term leases and in many cases annual

leases became increasingly popular and especially so when coupled with compensation clauses in relation to any un-exhausted tenant improvements.

Religious institutions remained significant life-lease landlords and at the time of the 1838 Select Committee Report on Church Leases a considerable number of church leases remained as leases for lives and years.

The 1838 Select Committee Report on Church Leases

One of the earliest documented studies into these leases was the 1838 Select Committee Report on Church Leases in England.

The Objective and Outcome of the Report

The purpose of the study was to examine various people's opinions, including valuers, lawyers, company secretaries and actuaries, on different means of adding value to the leased estate, beneficial to both the lessees and lessors. Possible options included:

> Replacing the lump sum fine by an increased fixed rental over the `new' 21 year term Enfranchising the interests, that is:
>
> 1. The lessor would buy the lessee out and re-lease the property at a market based `rack rent'.
> 2. The lessee would buy the lessor out and obtain mortgage financing for the transaction.
>
> Replacing the customary tenant right of renewal with a formal, contractual tenant right of renewal. The lessee would buy this perpetual right as an annualised additional `rent-charge'.

The Report is generally short on arithmetic specifics and did not come to any conclusions as to which option was preferred. However, we do know a Select Committee was ordered by the House of Commons in 1848 to investigate the management practices of the Ecclesiastical Commission, a corporation set up after the 1838 Report in 1840 to hold and manage many of the church leasehold properties.

The corporation, without any directions as to how to deal with the lessees, had proceeded to grant no further customary rights of renewal - the commotion this created amongst church lessees resulted in the 1848 Select Committee Inquiry. The problems faced by the lessees at the time were well summed up in a published memorial from the parish of Norwell in April 1842:

"the leasehold lands of the parish of Norwell to consist of 1,836 acres; long usage had established an entire confidence in all transactions connected with these lands; money had been freely lent on mortgage; they had become objects of settlement in .families. The decision of the Ecclesiastical Commissioners not to renew any leases had created a complete revolution in the value of property, and in the condition of its owners. Mortgagees were calling in their money, having no longer any confidence in the security. Nobody would lend any money on the lands, consequently mortgagees were foreclo sing and taking possession of the lands and houses, very little satisfied with their bargain, but to the utter ruin of the present holders of the leases."

Finally, we know that in 1893, the Rt Hon G Shaw Le Feure (an ex Ecclesiastical Commissioner) commented, in a book on Agrarian Tenures, that nearly half of the Ecclesiastical leases that existed earlier in the 19th century were conveyed to their tenants, the remainder becoming the absolute tenancy of the church and were rented out on a rack rent basis. It would seem, therefore, that the last option of the lessee buying a perpetual right of renewal was not instigated.

It is clear that at the time of the 1838 Report assessment methodologies and lease types varied considerably throughout England with the majority of the leases analysed relating to rural estates with little noted improvements. The following is a summary of the Report focusing on the assessment of the lessors and lessees interests at the time.

The Report highlighted two primary types of church leasehold estate:

	Leases for Years	Leases for Lives
Principle Term	21 years*	3 lives
Reserved Rent	Nil (Nominal & Fixed)	Nil (Nominal & Fixed)
Rent Reviews	Nil	Nil
Renewals	Every 7 years to a new 21 year term	On the fall of every life to a new 3 life lease
Tenant Right of Renewal	Nil however very rarely turned down by church* *	Nil however very rarely turned down by church*
Other payments to Lessor	Rolling `fine' payable every 7 years to `renew' lease to a new 21 year term	Rolling `fine' payable on fall of every life to `renew' lease to 3 lives
Advantages	Regular Income to Lessor	Relatively long lease term for lessee
Disadvantages for lessee	Relatively short lease term lessor and large lump sum	Irregular income to payable by lessee***

* *There were also 40 and 99 year building leases, common in urban areas where large improvements were to be undertaken.*

* * *In practice the tenant's right of renewal was acknowledged in church leaseholds and the price paid for the lessee's interest was in most cases above the annuity value of the lease. Church leases were therefore seen as unique in that they conveyed virtual ownership to the tenant. However the lessor still dictated the terms of the renewal and refusals to renew did occur, predominantly from non-church landlords.*

****Life insurance was typically taken out by the lessee to cover this payment upon his/her death*

The process by which the value of lessees interest (and including the fine) was arrived at varied throughout England. However, larger institutional landlords generally commenced with a reputable surveyor (valuer) assessing the annual (current market) rental value of the property net of outgoings such as the reserved rent, land tax and some repairs. Prior to the 1830s the `annual rental' was also commonly based on the improved property not the unimproved. An actuary was then normally brought in to calculate the value itself, particularly with leases for lives.

The Valuation of the Lessees Interest

The assessment of the value of the lessee's interest in a lease for years followed a similar process to the first stage of the value of the fine, however, the annuity was taken over the remaining years of the lease assuming a 21 year period. For example, a new lease for 21 years would be assessed at a `table' value of:

PV of £1.00 payment @ 5% over 21 years = 12.82 YP

12.82 YP x Net Annual Value = Leasehold Value

Interestingly the valuation basis is almost exactly identical to the New Zealand Statutory method of calculating the lessees interest under Section 122 of the Land Act 1948.

Actuaries and valuers at the time did not recognise the customary right of renewal in their theoretical or `table' value. The valuers and actuaries in the Report argued strongly against the logic of paying additional money for what was a legally groundless perpetual renewal right. Although they had to acknowledge that the `marketable' value of the interest

was typically higher in most cases.

This theoretical versus marketable value debate, was an important point of discussion in that under the Chancellor of the Exchequer's enfranchisement plan, it was initially proposed that tenants be compensated for their interests at the actuarial `table' value, despite the fact that many had purchased their holdings at a considerably higher rate, which allowed for the benefit of the customary renewal.

Examples of lessees interest sales include a 21 year lease of farming land in Westoe in 1825 which was bought with 16.25 years remaining for £6,000 equating to 20 YP. An important assumption in the purchase was the customary renewal right which we can analyse out as representing 45% of the purchase price. In the town of Wisbeach, at the time of the Report, leasehold interests in farmland would generally sell for 13 YP and around 15-17 YP in good times for a 21 year lease. Freehold land values at the time ranged between 20 to 30 YP.

There was no explicit *a priori* calculation methodology of the value of a lease for 3 lives and it was noted that because of the various combinations of possible sex and life span it was extremely difficult for the actuary at the time to calculate and tabulate a value with any certainty. Nevertheless, there was considerable discussion on what might influence the value of these leases and it was generally acknowledged that the required return (or interest rate) for freehold estates would be less than for leases for 3 lives which in turn would be less than for leases for 21 years.

During the 17" century the value of a new tenancy for 3 lives was generally reckoned in the Western Counties of England at between 12 to 14 YP. By the end of the 181 century this had increased to between 16 to 18 YP. At the time of the Report, in 1818, 72 acres of farm land in the district of Otley, leased for 3 lives (72, 28 and 10 years) was bought for £4,480 - 2 years afterwards a fine for renewal of a life was assessed at £250 representing 1.25 YP times the annual value of £200 pa. The sale equated to 23 YP. The typical value of a new 3 life estate was generally reckoned at 18 to 19 YP at the time.

By reversing the `table' value formula we are able to gauge how the average tenancy life-span increased from the 171 to the 191" century based on a new lease of 3 lives duration:

Century	Market based VP	Equivalent term of dcars (at S%)	Implied average tenancy life-span
17"	13	21.5	7.1 years
181"	17	38.9	12.9 years
19"	19	61.4	20.5 years

The Valuation of the Lessors Interest

Contrary to today, when freeholding was contemplated, the valuation of the lessor's interest sometimes known as the inheritance of the property was typically a residual calculation of the freehold value less the lessees interest.

The Report noted, in 1814 a small estate was enfranchised (combined) through the lessee (forced into for land tax purposes) buying out the lessor's inheritance of the property. The freehold was first assessed at around 27 to 28 YP with the lessee interest (with 3 new lives) assessed at 18-19 YP. The difference between the two was the sum required to be paid to the lessor for his interest. In this case therefore the lessees interest for 3 lives was approximately 66% of the freehold value of the estate.

In another example, in Sedgewick in 1833 the freehold was estimated at 15 YP on an annual rent of £30.0. The leasehold was reckoned at 8.5 YP for a 21 year lease with 13 year to go. The lessors interest (to be sold) was therefore taken at 6.5 YP.

There was little explanation given in the Report on how lessors interests were calculated on a

stand alone basis. In another article it is stated that in the 17' century the YP calculation was undertaken based on the reserved rent and not the net annual rent.

The New Zealand Situation - The `Glasgow' Lease

The Glasgow lease, as we know it in New Zealand, appears to have evolved from the early English customary land tenure known as an estate for life or lives. These estates were still in evidence in England at the time of New Zealand's colonisation in the 1840s although their use and usefulness were certainly declining.

Coinciding with their use in England, the long term ground lease was first introduced into New Zealand through the management of local body, and particularly religious institutions, endowment estates.

An important feature of the early settlement of New Zealand was that certain proceeds were specifically set aside by the New Zealand Company for the endowment of religious, municipal and educational purposes. The best known examples being in the provinces of Auckland, Wellington, Nelson Canterbury and Otago. The Otago settlement scheme in 1848 was particularly focused and successful with 1/8t' of proceeds from land sales set aside for religious and educational purposes, and more importantly, of one faith the Free Church.

Whereas the key to the successful colonisation and future development of New Zealand was seen by the New Zealand Company and the Crown as being based primarily on the selling of freehold land at a minimum price, the successful on-going religious and educational development of the Otago region was seen by the Presbyterian Free Church as being based to a large extent on the use of the long term ground lease.

An analysis of 3 early hand written Otago ground leases granted in the early 1850s by the Trustees of Property for Religious and Educational Purposes indicate initial lease terms of 7 years and a fixed monetary rent with no formal mention of a tenant right of renewal. In the 1860s, the Presbyterian Church granted ground leases for terms of 21 years, again with a fixed rent and no formal tenant right of renewal.

Otago was not the only province to lease out endowment land, however, their scheme for various reasons (including the gold rush) was particularly successful. The use of the long term ground lease not only generated a reasonable return on the land it also provided a low cost substitute for freehold ownership by settlers with low capital reserves and furthermore encouraged these same settlers to improve their holdings (in many cases these leases had compulsory improvement clauses). The return proceeds were then not diluted over numerous competing causes (as they were in other regions) but ploughed back into specific religious and educational purposes of the Church.

By the time of the great land tenure debates in the 1880s, the success of the Otago region and, in particular, its leased endowment estates could not be ignored. The State had persevered with the pioneering concept of selling the freehold in Crown lands, however, on its own, this policy was resulting in the greater aggregation of land holdings with fewer and fewer opportunities for the settlement of people of smaller means.

During the Land Bill Amendment debates of 1882, the Hon Mr Oliver noted the extensive Otago endowment leases (used back as far as the 1850's) as past examples of where renewable and reviewable leases had succeeded - he also argued that the same principles were not revolutionary or new and should be adopted by the State.

The first State perpetual lease was formalised in the 1882 to 1884 Land Act Amendments. The 1882 Amendment Act allowed land to be offered for lease at public tender with an upset fixed rent of 5% of the cash value of the land. The initial lease term was for 30 years with rights of renewal of 20 years thereafter.

Over the next two decades the land tenure question was the focus of considerable parliamentary debate and numerous versions of the leasehold tenure were introduced

for varying reasons. New leasehold tenures included the perpetual lease for terms of 30 and 21 years, with and without certain rights of purchase and renewal together with the lease in perpetuity for 999 years. The small grazing run lease (introduced in 1885) had a term of 21 years with rights of renewal for successive terms and an upset fixed rent set at 2.5% of the capital value of the land. Interestingly, the lease in perpetuity was introduced by John McKenzie (the son of a tenant farmer born and bred in Scotland) in 1891 and W R Jourdain in his summary of land legislation in New Zealand noted the tenure:

"gave to the farmer a title equal to a freehold with a moderate, feu-rent unchangeable."

During the 1887 Land Bill debates the Hon Mr Reynolds also referred to the "South" as a past example where leases had been successful. In this same debate the Hon Mr Stevens of Christchurch utilised the term "Glasgow Lease". Mr Stevens, an ex land agent, noted this lease as one that had been used in many parts of the colony by local bodies and explained it briefly as:

"a lease in which the land was periodically revalued separately from the improvements. The improvements were separately valued, and the existing lessee, if. he choose to give the rent at which it was valued by arbitration, had the right of continuing his tenancy; and, if he did not, the incoming tenant paid the outgoing tenant for the improvements. "

Wherever the term `Glasgow' came from it would be reasonable to assume that it has something to do with the debate surrounding the introduction of the State leasehold tenure during the 1880s and may have been coined to describe the successful earlier endowment leases used in the Otago region for religious, educational and municipal purposes. Two possible links include firstly, that the Otago region was seen as primarily a Scottish settlement and as Glasgow was the commercial capital of Scotland at the time, so to was Dunedin and, secondly, the original plan for the Otago settlement (which included the financial provision for churches and schools) was conceived and drafted in an influential meeting in Glasgow in 1847.

Irrespective of terminology, the Glasgow lease (as we know it today) certainly appears to have also evolved within New Zealand, and although the 7 and 21 year terms can be traced back to early England, the formalised right of renewal cannot. The number of variations and modifications to the State leasehold tenure prior to the 1900s also suggests the evolution of a distinct new tenure, unique to New Zealand but with origins dating back the middle ages.

Origins Summary

The Glasgow lease, as we know it in New Zealand, evolved from the early English land tenure known as an estate for life or lives. This is not to say that this customary tenure actually originated in England as similar tenures were also found on the Continent and especially Italy.

With the increasing emergence of an `economic' perspective in the 141' century, the tenant's role as the developer and `improver' of the land became more important. The established church who had large estates and inheritances in land, were particularly keen to see their holdings become more productive and profitable.

From this time onwards, the use of customary estates for life or lives diminished and the contractual lease for a term of years emerged. For comparative purposes, an estate for 3 lives (the most common customary tenure) was reckoned as equivalent to a fixed term of 21 years, the implication being that each life was on average equivalent to 7 years.

The church, which had little intention of ever using or selling the land, in effect guaranteed the tenant a renewal of the lease indefinitely. This distinguished the church leases from other lease types and created a very evident and valuable `tenant right' in addition to any calculated annuity or table value of the lease.

At the time of the Select Committee Report on Church Leases (1838) there were two main types of long term church leasehold land in England, leases for 3 lives and leases for 21 years. Both, however retained a

customary right of renewal only. The lessees interest was generally assessed at 2/3's of the freehold value of the land and the lessors interest was typically the residual left over after the lessees interest had been deducted from the freehold value.

The traditional Scottish land tenure of feuing, although similar to the customary estates for life or lives, does not appear to have evolved in a corresponding fashion. The formal recognition of a perpetual right of renewal, however, may well have been transferred in principle through the mindset of early New Zealand colonists.

In New Zealand the Glasgow lease, as we know it today, appears to have also evolved from the early endowment leases used by the founding municipal, religious and educational institutions. Although the 7 and 21 year terms can be traced back through early New Zealand to England, the formalised right of renewal cannot.

In terms of contemporary valuation practice the following inferences can be drawn from the above historical review of the `Glasgow' lease:

- In any free-holding process the lessees interest in the land should be exclusively recognised both in legal and economic terms and not simply valued as a residual sum;

- In terms of value, the lessees interest in the land is certainly capable of being the dominant interest. This was evidenced in early England and despite the fact that for centuries these tenures also existed with no formalised right of renewal.

This leads to another important valuation implication. Where a formalised right of renewal does exist, as it does today, the value of the lessees interest should reflect the fact that the tenant has gained an additional right, that in economic and practical terms, is equivalent to (and in fact a substitute for) freehold ownership of the land.

This implies that the lessees interest has not one, but two value components, firstly, an `intrinsic' annuity value derived from any benefit rent, u inclding the right to that benefit in perpetuity and, secondly, an `extrinsic' value that the ground rent offers as a direct substitute for the forgone freehold mortgage finance requirement.

In other words, the formal creation of a perpetual ground lease has also produced a legal and economic alternative (or substitute) to freehold ownership at a (sometimes) lower annual cost. This has additional value to the lessee over and above any contractually sourced (and internal) benefit rent and explains why in practice the annuity value of the freehold (or freehold market value) can in many cases be less than the summed value of the lessors and lessees interests;

- The quantum and proportion of the lessees interest will change over time and is not simply a direct function (or percentage) of the freehold value of the land.

- The valuation profession has not come any closer to accurately assessing the value of the lessees interest in over 160 years; and

Some criticisms never change, two extracts from the 1838 Report include:

"I have an instance by me of a valuation of an estate which one man valued at 2,300 l.; I said, I think this is over-valued. The next valuer makes it 1, 600 1. Now I see, from the great variation, that they have no definite principle ; I am certain that they do not go upon any good, reasonable rule."

And furthermore;

"I mean to say that a great deal of the value which a land valuer will put upon the property will depend upon the party that employs him."

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30 Interestingly when inflation declined and a series of agricultural depressions occurred during the seventeenth century, the earlier fine system had a short revival Lifeleasehold in Western Counties of England -1650-1750 Christopher Clay The Agricultural History Review Vol 29-30 page 86.

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38 The 1838 Report page 107 paragraph 1633 and page 299 paragraph 4738

39 Ibid page 5 paragraph 45

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41 Ibid page 29 paras 365-370 and page 10 Para 103. In a few instances however the improved value was not used until after the first renewal, especially where large improvements had been completed (page 58 pars 928-934).

42 At the fall of every life or 7 year period the fine was payable to the owner in order to renew the lease up to the original term. The assessment of the rolling fine recognised the added value to the lessee of the additional 7 year term or life. In the case of an initial 7 year renewal the fine value was assessed as the present value of the annual rental deferred for 14 years, for example:

PV of 81.00payment@7% over7years = 5.39YP
5.39/(1.07)" = 2.09YP
2.09 YP x Net Annual Rent = Value of Fine

43 YP stands for Years Purchase (the reciprocal of the capitalisation rate). The valuation ratio was used in England for the valuation of land, based on an annual money rent, as far back as the 13th century. See The Long Term Rate of Interest and the Price of Land in the Seventeenth Century - H Habakkuk - The Economic History Review 2nd Series Vol 5-6.

44 British Parliamentary Papers 1837 1838 Vol 1 X - Report from the Select Committee on Church Leases - 7 August 1938 page 317 paragraph 4939 and page 439 paragraph 6971

45 Ibid page 441 paragraph 6972 6996

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47 That is the annuity 'table' value represents only £3,300 at 5%

48 British Parliamentary Papers 1837 1838 Vol 1 X - Report from the Select Committee on Church Leases - 7 August 1938 page 56 paragraph 892-893

49 Ibid page 12 paragraph 131

50 Ibid page 315 paragraph 4915

51 Lifeleasehold in Western Counties of England 1650-1750 Christopher Clay The Agricultural History Review Vol 29-30 page 89

52 British Parliamentary Papers 1837 1838 Vol 1 X - Report from the Select Committee on Church Leases - 7 August 1938 page 283 paragraph 4513 4528

53 This was not always the case however, as the large variations between the annual (current market) rent and the reserved (contractual) rent created valuation difficulties and inconsistencies - The Long Term Rate of Interest and the Price of Land in the Seventeenth Century H Habakkuk The Economic History Review 2nd Series Vol 5-6 page 26.

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The New Zealand Situation The'Glasgow' Lease

57 The Church in a Special Colony J McKean Synod of Otago and Southland Publishers-1994 page 151

58 It was not until the 1880's when type written Presbyterian Church leases for 21 years were entered into specifically allowing for a tenant right of renewal. This however was only after the lease had firstly been formally offered up for public auction to the highest bidder. In the event that the incumbent lessee was not the highest bidder then compensation was payable for any improvements made to the property over the previous term of the lease.

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60 Land Legislation and Settlement in New Zealand WR Jourdain Government Printing Office 1925 page 31

61 Parliamentary Debates December 21 1887 page 948

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63 Ignoring the Dunedin Edinburgh connection

64 A survey of ground leases world wide indicated the vast majority had terms of between 51 to 99 years. 'Ground Leases - A National and International Perspective' L.M Freeman 1993, New Zealand Institute of Valuers page 76

Origins Summary

65 English Society in the 11th Century P Vinogradoff - Oxford 1908 page 230.

66 British Parliamentary Papers 1837 1838 Vol 1X Report from the Select Committee on Church Leases - 7 August 1938 page 436 paragraph 6917

67 It is understood that the Irish Presbyterian Church were likewise embroiled in the leasehold question and in 1850 also held a Tenant Right Conference.

68 This dual value approach to the assessment of the lessees interest is also evidenced in a yet to be published study of 60 commercial and industrial, vacant lessees interest sales within Dunedin City over the last 15 years.

69 Ibid page 318 paragraph 4951

70 Ibid page 318 paragraph 4954

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TREES: A GROWING NUISANCE

Frank Light

INTRODUCTION

In recent times, I have become increasingly aware of the profound disquiet of relatives, friends and acquaintances following the purchase of the family home. Such disquiet has not been the rare and isolated event that one might imagine, but instead, seems to occur in a disturbingly high proportion of purchases. Since the family home probably represents the single most important and valuable asset of most families, its purchase is usually accompanied with high expectations, emotion and excitement. Yet the anticipated pleasure of moving in and setting up home is too often spoilt by matters affecting relations with the neighbours and if these concerns are not resolved amicably they tend to rapidly degenerate into confrontations that feed on stress, cannot be reversed and beget behaviour that is both destructive and hurtful to all concerned.

Into this field of anguish fall boundary disputes, antisocial activities and nuisance, and it is to the last of these that my attention is drawn. Even more precisely, it is to the role played by trees as the potential cause of nuisance that I focus my attention. I do so because I believe it is the leading villain causing a breakdown in what might otherwise be reasonably civil neighbourly exchanges. At the same time, I have observed that a possible contributing factor is the changing pattern of land development particularly in the now well established practice of in-fill urban housing and the more recent growth in small rural lifestyle blocks.

Having identified trees as the principal culprit in this troublesome litigious area, I puzzled over how best potential problems could be avoided, mitigated and remedied. In this regard, my attention was attracted to those most able to remain detached from the emotional implications of house purchases - the real estate professional - possibly the real estate agent (especially where they act on behalf of the buyer) but more certainly the registered valuer.

Let us now look a little more closely at the salient aspects of the problem.

Why Trees?

Of all things capable of causing a nuisance trees are highly visible and their presence is not blurred to the same degree as those things (such as smells, sounds, vibrations, heat, etc) which require sophisticated measuring devices and where their effects may be unsettled by expert evidence.

A further complicating factor is the positive imagery held of trees by humankind - the value of trees today as an essential part of life on this planet is reflected in the habit of homeowners to plant gardens and be attracted to parks and reserves. Thus it is not surprising that anyone looking for a new home will be subconsciously predisposed to a well-treed neighbourhood. But trees continue to grow (some species at alarming rates) and undermine drains, paths and courtyards, fill and block spouting, obscure views and deny a house the sun's warm winter rays and it is as a result of these effects that the nuisance is discovered.

It is also worth noting that it is often following the arrival of new owners in their home that questions are raised. This should not be seen as surprising since the established neighbours have not yet developed any constraining community relationships and accordingly there are no social bonds to be broken. This too tends to focus attention on the time of purchasing a new home as the critical point in such matters.

What is Nuisance?

As a general guide, nuisance occurs where an occupier of land allows anything to escape from their land, such as water, smells, noise and vegetation onto adjacent property causing substantial interference with the neighbours ordinary use and enjoyment of the land. It is governed by the common law and developed overtime by cases. It must be a substantial interference in order to upset the well established legal standard that exists "between the right of an occupier to use and enjoy his own property and the right of his neighbour to be protected from interference or injury" Cleary J, *Morgan v Kyatt.* Thus the balance must be clearly upset for nuisance to occur. That influential case concerned a nuisance created by the substantial interference of tree roots, however its essential principles would equally apply to other things such as noises, smells, vibrations, etc.

A further point that needs to be kept in mind is that the liability of the offending occupier is not cancelled by evidence that the neighbour bought the property knowing of the existence of the nuisance or that they subsequently failed to take remedial steps to abate it. This latter aspect would only be relevant in so far as it affects the neighbours' general responsibility to mitigate the damages they are sustaining.

Unfortunately, one also needs to be mindful of the fact that in regard to trees in particular, the common law of nuisance is limited to interference caused by the actual encroachment of roots and branches etc. It does not apply to those trees planted elsewhere on a property because they are seen to be an ordinary and natural use of the land. Yet, with urban communities in particular, it is such trees that also contribute to the problem. To meet this failing in the common law, an amendment to the *Property Law Act 1952* was passed in 1977 dealing specifically with trees.

The Application of S 129C Property Law Act 1952

This statute enables an occupier to apply to a District Court for an order to remove or lower any trees on land zoned for residential purposes. However to succeed one must establish under subsection 8 not only:

- that the tree is causing, or likely to cause, injury or damage, or
- that it is obstructing any view, or
- diminishing the value of the property, or
- reducing the enjoyment of it for residential purposes

but also;

- the Court must be satisfied that the hardship caused to the applicant is demonstrably greater than the hardship suffered by the defendant

This latter provision of the statute reflects the very similar balancing criteria referred to earlier when describing the law of nuisance and findings of Cleary J in *Morgan v Kyatt.* I.G. Eagles in his article "A Vandals Charter" portrayed a grim picture of the consequences that would result from the introduction of s 129C, arguing that it departed too drastically from the common law and gave applicants a greater chance of having trees removed than it did of protecting a defendant's trees. Thankfully, this prediction has not been borne out by events. This point was clearly reaffirmed in the District Court case *Judge v Rhodes,* where an application for an order was refused on the basis that the tree concerned did not unduly obstruct the applicants view or interfere with the enjoyment of the land and that even if it had it would not necessarily overcome the hardship of the defendants who would lose their shade and shelter.

Furthermore, under subsection 6 the Court, when considering such applications, must also take into account community values such as the overall aesthetic environment, public amenity, any unique arboreal factor and any adverse effects.

Legal Remedies, At What Cost?

As you can see, the law does provide remedies relating to hardship caused by trees to adjoining land, but are they realistically within the means of the average home buyer? For most of us faced with this type or problem it is necessary at the outset to, at least, consult a lawyer. Having once discovered the costs involved in taking such matters to Court it is not surprising that they remain unresolved and have the potential to form the nucleus of a neighbourly feud. Eagles, also pertinently observed in his article that "Adversary proceedings are ill adapted to solving complex problems and should be confined to conflicts where the legal issues are precise and clear".

You may consider this type of problem to be suitable for resolution by mediation, and in some situations by a referee of the District Court, and I concur, provided this avenue is explored at the earliest opportunity. However, I believe that if the parties have already faced up to each other, their neighbourly good will, the essential ingredient for a successful mediated resolution, will have been lost, as the parties will have retreated to their respective stand-off positions.

Changing Land Use: A Contributory Factor?

The development of small inner city subdivisions, often referred to as in-fill housing, may also have exacerbated the problem. Since the owners of such properties devote most of their available land and a significant capital sum to the erection of their homes they inevitably become highly sensitive to what they perceive as threats to themselves and their property. These concerns are understandably heightened by any sizeable tree in the immediate vicinity.

The expansion of rural lifestyle blocks in the vicinity of urban areas also seems to give rise to disputes relating to trees. In the more open and traditional farming community trees are often planted close to boundaries and this rarely gives rise to disputes, not only because of the constraining self interest to preserve ones good standing in a more isolated rural community but also because the benefits of a shelter belt of trees are enjoyed by adjoining owners and any detrimental effects only extend to the near acreage. Lifestyle blocks on the other hand, especially those under 10 hectares are more likely to suffer the detrimental effects of root invasion, branch debris and sun shading, not to mention the changed social relationships between traditional and lifestyle farmers.

The Role of the Real Estate Professional

Real Estate Agents

Generally speaking, Agents would not be expected to acquaint themselves with the legal implications of the nuisance caused by trees. They invariably act on behalf of the seller with their primary purpose being to effect a sale - although s 9 of the *Fair Trading Act 1986* may protect prospective purchasers who are misled by the agent concerning the state or condition of any trees. Agents are also not specifically required by their

governing body, the Real Estate Institute of New Zealand, to receive training/education in this aspect of the law. Clearly, if they have been instructed by a purchaser to seek a suitable property and thereby become aware of the implications of a nuisance caused by trees they would owe a duty of care to their principal to disclose this fact. Notwithstanding this point, such knowledge would not normally fall within the requirements of the Real Estate Agent in their dealings with the seller or buyer.

Valuers

Valuers are in a quite different position because they are invariably brought into property purchase transactions at an early stage, as part of the procedure required by lending institutions to determine the security available to them for the loan being sought and this requires a site inspection.

I will now address their responsibility from three perspectives:

(i) Valuation Standards

The current *New Zealand Institute of Valuers (NZIV) Valuation Standards 1995* specifically provides in s 2(3) of Practice Standard 1 on *The Valuation of Residential Properties,* that the required site inspection:

"... should establish ... the proximity of trees only to the extent that they are likely to affect the property's value."

This standard appears patently clear and you could be forgiven for believing that the thrust of this paper should now be concluded. But the anecdotal problems I mentioned in my introduction occur in spite of the existence of s 2(3). I suggest the difficulties arise because of the rather narrow interpretation taken by registered valuers of s 2(3). It is only when trees stand out, and their positive or negative value is abundantly obvious, even to the layperson, that a registered valuer will incorporate its affect in the valuation. They do not appear to demonstrate a full enough appreciation of the risks posed by trees and the connection between a potential nuisance and the effect that this may have on the value of the property.

Remember also that under s 129C of the *Property Law Act 1977* the District Court is required to consider matters other than value. This point is illustrated by the case *Glenie v McEachen* where Williamson J in the High Court upheld a District Court decision ordering the removal of a row of Lawsoniana Cypress under s 129 C of the *Property Law Act 1977,* on the basis that hardship faced by the appellant included not only a loss of enjoyment caused by the trees obliterating the winter sun but also a diminution in value. This point tends to support the notion that there are considerations, other than value, that need to be taken into account by registered valuers since they are the professional body in the best position to ascertain all the relevant circumstances surrounding a property at the time of its inspection. It is worthwhile noting that a valuers report had been obtained in *Glenie* by the applicants and this was a factor in the decision.

From an international perspective, it is interesting to note that the NZIV Valuation Standards were introduced following a series of reviews, including a significant contribution by the International Asset Standards Committee (TIAVSC), a body which counts New Zealand, Australia, United States of America, United Kingdom and Canada among its members. Also New Zealand has enjoyed a long and close relationship with the United Kingdom Royal Institute of Chartered Surveyors and, not surprisingly, in their 1997 practice statement manual under PS9, 2(5) on the site inspection standard to be applied in valuing trees in residential properties, they use the identical words to those contained in NZIV 2(3).

(ii) Duty of Care

In addition to meeting the NZIV professional standards, you must not forget that more importantly, a duty of care in both contract and tort is owed to the client and that failure to fulfil this duty exposes the valuer to a claim for damages in negligence. This duty is described in 49 Halsbury's Laws of England and includes the statement that:

"A person who holds himself out or purports to act as a valuer represents himself as having the skill and knowledge which a

reasonably competent member of his profession or calling would have, and it is his duty to his employer to use such skill, care and diligence as is reasonably required in the work which he has undertaken."

This description of the extent of the duty of care is a fair one and was confirmed in *Corisand Investments Ltd v Druce and Co.*

Against this background, you need also to consider the findings of Watkins J in *Singer and Friedlander Ltd v John D Wood* & Co that a valuer is not liable merely because a property is overvalued or undervalued and that the permissible margin of error is in the order of 10 percent. You may consider that this finding exonerates the valuer from the situation contemplated in this paper. However I would beg to differ. If the problem I have described is just one more financial detail of the overall valuation figure I would be inclined to agree, but on the contrary, I have identified the presence of trees as a potential nuisance as the critical element, rather than an assessment of the overall value. A potential nuisance should be obvious to a reasonably competent valuer whereas it may not be to a house purchasing layperson.

I believe that within the overall duty of care owed by valuers to their clients it is necessary at the time of inspection to view trees not only for the affect they have on value, but also for any potential nuisance that they pose.

(iii) Fair Trading and Consumer Guarantees

Section 9 of the *Fair Trading Act 1986* prohibits misleading and deceiving conduct by anyone in trade and the conduct complained of, not only applies to positive acts, but also extends to omissions, including silence. Unlike real estate agents, valuers are not an active participant in the sales process. Instead, the focus of their attention is on the valuation report and accordingly there is much less likelihood of any breach of the Act taking place. However, as J Pedley, in her article *"The Repercussion of Silence ",* explains, any person who omits to incorporate information that should have been brought to the attention of their client may be liable.

The more recent *Consumer Guarantees Act 1993* specifically deals with persons, such as valuers, who supply services. It provides a number of guarantees in regard to services with the most pertinent, insofar as this paper is concerned, being section 28 which guarantees that the service will be carried out with reasonable care and skill. Valuers would do well to be mindful of this as they could easily come under this section.

However, relevant as these sections may be, I would nonetheless envisage, from a practical perspective, neither of them being successfully invoked against valuers without a full and objective consideration of the duty of care that can be expected of the reasonably competent valuer.

The Removal Cost of Trees

Obviously, since trees reflect the same infinite variation as the human species there cannot exist some reliable formulae to determine the costs of their trimming or removal. However, from an anecdotal perspective there have been two recently publicised exercises that may give you some idea of the costs involved. The first involved the removal of two mature oaks from an extremely confined in-fill housing subdivision in Feilding that reportedly cost in excess of $2,500 (confirmed by the tree remover Bridge Tree Removals). The second involved the removal of twenty-two mature Pinus radiatas from the renowned Eden Gardens in Epsom, Auckland, that necessitated the use of a helicopter and resulted in a final cost of $34,000.

From these figures it is clear that the cost of removing trees in compromising urban situations is likely to involve significant costs.

By contrast, the removal of trees in the rural environment is less likely to pose site difficulties and the costs per tree unit will be substantially less. However, because of the scale of farm shelter belts the lower cost per tree unit is offset by the extended hours required for their removal and ultimately they too incur significant costs.

Conclusion

Notwithstanding my arguments regarding some of the legal issues posed by trees causing a nuisance, I find the most compelling reason for valuers to include such a factor in their overall valuation to be the stress and unpleasantness faced by some new home purchasers soon after they have moved in. The valuer is in a unique position to assess this factor objectively and dispassionately. I feel certain that prospective purchasers would seriously consider the implications of any observation contained in a valuers report and welcome the opportunity to avoid or resolve such matters before becoming bound to an agreement.

In order that such a factor could become part of a valuers general expertise changes may have to be made to the training and education of valuers and prospective valuers. This is not likely to pose any insurmountable problems especially if, as I claim, a legal duty of care already exists to disclose a potential nuisance. In this regard the New Zealand Institute of Valuers Continuing Professional Development system which became mandatory from 1 January 1996 would be an ideal opportunity to visit this question.

About the author

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Watch that Market *a recollection from*

Squire speedy

I was standing in a long queue for my beer ration when it all started. There I was, freshly arrived at the Air Force South Pacific Base during World War Two. Everything was new and impressive. The tropics are hot even in autumn. The Air Force Flew up supplies of beer to keep up moral, although there was not enough to satisfy the demand. They got around the problem by issuing us with two coupons a week which we could exchange at 30c each for a quart bottle of beer. No wonder the queue was long. Pale of skin and not yet accustomed to the heat, standing in the tropical sun among the coconut palms made me even thirstier than before.

While I was waiting a fellow airman sidled up to me and started chatting in a very friendly manner. In due time he showed me his sparkling new boy-scout type knife. You probably know the sort. It was a poorer version of what we now know as the Swiss Army knife.

"what do you think of this? ", he asked. I drooled over it.

"I tell you what ", he said in an unctuous tone.

"I'll let you have it, for 50 cents if' you give me your beer coupons. "

I thought it over quickly. The knife would cost a lot more back home. The beer coupons cost nothing. I could buy Coke for a lot less than beer. What did I have to loose? "Okay", I said. I had a smile like a Cheshire cat thinking how I could use the knife to cut up coconuts and the like.

As time went by, I established a few facts about the local scene. If you were pepared to forgo your beer and left the two bottles under your pillow when you went to the US Navy open-air movies, you would find that the "fairies" had left $3 and sometimes $4. When I visited the American PX store on the other side of the island, I found that I could buy the same knife for only 35 cents. I realised I had struck a rotten deal out of sheer ignorance. Progress is made by learning from mistakes, but preferably some one else's. I simply didn't know the local market. I guess my pride was also hurt. But then I reflected a little. I had assumed that the market was similar to that back home, but I was in a totally different location and economic environment. From this I learned the first three principles of practical economics the hard way.

Know your product,
know your true costs and
know your markets.

I also learnt what I later discovered was the valuers' doctrine that cost does not necessarily equal value. Far from it.

That was not the end of the lessons. On the way back from another visit to the PX by bus, I sat opposite an American sailor. We exchanged greetings and he was surprised that I was in the New Zealand Air Force. Yes, he had heard about Noo Zealand somewhere near Australia. He couldn't keep his eyes off my watch. I had bought it at Farmers in Auckland for 25 shillings (which was then the equivalent of US $5), just before I left on my overseas tour of duty.

"Nice watch you've got there, Buddy".

"Glad you like it. " "What is it? "

"It's Swiss with 21 jewels ", I declared.

He emphasised the 21 and drawled out the words slowly.

"Can I see it? "

"Sure, Here it is. " With that I handed it to him

He fingered it lovingly.

`Is that real gold around the top? "

"I guess it's plate gold".

"It sure is a beauty. Would you like to sell it?"

"No thanks. It's the only one I've got".

"I tell you what, Bud. I'll give you $10 for it."

"No thanks. It's not for sale ".

We chatted about the heat, the PX and watches.

"Will you take $20? ".

"Sorry, but I need a watch too. "

I reached over for my watch as the bus continued its journey around the island. It stopped every now and then to let off American GIs and pick up a few others. We chatted a bit more. I pointed out the pale turquoise sea between the coconut palms. Eventually, my newly found sailor friend said:

"What about $30? "

At that figure I hesitated.

"The trouble is it will take me such a long time to get another just like it with 21 jewels."

I was beginning to sweat and it wasn't the heat alone. We continued to chat. Then my newly found sailor friend suddenly jumped out of his seat and excitedly exclaimed.

"I must get off at the next stop. "

He reached down in his pocket. *"I tell you what. " You can have all I've got on me. "* It came to $37.50. As he started to get out of the bus we made the exchange. We were both happy. I wrote home for another 25 shilling watch which arrived a few weeks later.

I sure learned a lot about markets from that.

One point remains, however. What was the true value of that watch?

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INFLUENCE OF COMMODITY PRICES AND FARM PROFIT ON RURAL LAND MARKETS AND VALUATION PRACTICE

Chris Eves

Abstract

Following a period of restructure, in the agricultural industries in free trade countries such as Australia and New Zealand, there has been an increasing awareness of the income and returns that can be generated from agricultural land. As producers are more concerned about the financial viability of their farms, valuers should consider the economic potential of land in both the analysis of the market and the valuation of individual rural properties.

Introduction

The valuation of rural land in Australia, New Zealand and the USA has been based on the market assumption that the more productive the land, the greater the value of that land. Productivity of rural land is a function of climate, topography and soil type. If all of these factors are favourable, then land prices will be higher than rural land where some of these factors are not as suitable. However, the variability and volatility of farm commodity prices over the long term does add a land value risk over any holding period. The valuer is generally asked to value the rural land on any given day but is sometimes asked to comment on long term viability of farm operations and income for proposed financing.

This assumption in rural valuation methodology mirrors the rural property market, in that land that has good soil, a relative flat topography and reliable, adequate

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rainfall will always be worth more per hectare than property that lacks these attributes, as the better land has the potential to produce a greater return per hectare.

On this basis changes in land prices, between various rural areas, should be based on the overall income that can be produced from that land with an assumption of "average" commodity prices and operating costs over time. Such a basis would include all factors, especially management, that determine the level of agricultural income from various types of rural land.

These assumptions are gaining more importance in the free market regimes that exist in the rural markets of New Zealand and Australia, where farm incomes are based on real farm productivity rather than grants and subsidies. The increasing economic constraints, on farmers in both countries, such as decreasing terms of trade and increasing debt levels has resulted in land use to generate optimal "free market" farm incomes without subsidies.

Previous studies, in New Zealand (Sweetman, 1943; Brown, 1959; Halstead, 1968; Frizzell, 1979) and Australia (Collins, 1959; MacPhillimy, 1969,1972; Murray; 1969; Rost and Collins, 1984; Hornby, 1995) have documented the variation in rural land prices due to these climatic and physical differences (soil type, location to markets, topography, irrigation etc). In both Australia and New Zealand, studies have also been reviewing rural valuation methodology to reflect the difference in productivity within specific areas (Rost and Collins, 1984; Hammersley, 1989; Hargreaves, 1986). Unlike the market recognition of the variation in land prices from location to location, there does not appear to be the same level of variation in land price within specific locations for land of differing levels of productivity. This may be due to inefficiencies in the market place or land purchased for uses other than agriculture. In these rural land markets, land prices should reflect the individual farm productivity based on the past and current management of the farm, as well as the general physical and climatic factors.

Valuers have attempted to link the farm income potential to rural land value. Rural land valuations based on an income methodology have been developed but to date are not used as a primary valuation method for rural land. Methods such as the New Zealand productivity method are based on sound agricultural and business criteria. Rural appraisers in the US have been using income valuation methodologies since the 1970s (Murray, Harris and Miller, 1983).

The purpose of this paper is to analyse land sales and farm income over the period 1974 to 1995 for marginal and traditional farming regions, in Australia, to determine if changes in land prices were based on changes in actual farm profitability or potential profitability (Commodity price). This analysis will attempt to indicate the level of correlation between farm enterprise type and changes in land value. The study will also attempt to determine if the change in marginal rural land use can be justified in both farm income and land price movement.

STUDY AREA

This study focuses on three Local Government Areas (LGAs) in the Central and Far West Regions of New South Wales, Australia. These LGAs are Weddin Shire, Lachlan Shire and Cobar Shire.(refer to figure 1)

* Note table 1: Prior to 1960 statistics were only held for the entire Western Division. (Fitzsimmons, 1996)

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Figure 1: LGA Location

1. Weddin
2. Lachlan
3. Cobar

Tablel : LGA description

LO Al'ION	WEt)l)IN Central kVest NSW	LACHI AN Central West NSW	COBAR Far West NSW
RURAL HISTORY	Traditional, reliable, safe mixed farming	Grazing to 1960s, now marginal mixed farming	Arid grazing to mid 1970s, now extremely marginal cropping in eastern sections
Land Use	Cropping: winter cereals. Livestock: medium merino wool, fat lambs & beef cattle	Cropping: winter cereals, Livestock: medium merino wool, limited cattle	Cropping: winter cereals. Livestock: strong to medium merino wool
Climate	Reliable winter dominant rainfall. 650mm p.a. Cold winters. Warm to hot summers	Winter dominant rainfall 500mm p.a. Cold winters. Hot summers	Unreliable winter dominant rainfall 350 to 400mm p.a. Cold winters Very hot summers
Soils	Good quality red and brown loams	Light to medium sandy red loams	Light sandy soils with some shale.
Average Wheat sowings (ha) 1922-1989	46,700 ha	124,500 ha	13,300
Crop Areas 1995	53,400 ha	241,000 ha	25,100 ha

Sources: Department of Agriculture 1982, Fitzsimmons (1996)

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These three LGAs were chosen so that a comparison could be made between an area that is considered long term economically and environmentally sustainable (Weddin), both in the short and long term, and two areas that are considered to be at risk. Lachlan LGA is an agricultural region that is at risk in the long term. This risk is due to economic conditions over the past five years (low yields and low commodity prices) which are resulting in an increase in land sown to crops to boost income (ABARE, 1997). Cobar LGA is at risk from both an environment and economic situation if the trend towards cropping continues. The economic viability of this area as grazing land is also dependant on the long term viability of the wool industry and the ability of the cleared cropping land to be re-established (Eves, 1995).

DATA SOURCES

The research covers the period from 1974 to 1995. Data for the study can be broken down into the following:

i) Land Prices

For analysis purposes, this twenty year period includes the rural boom period of 1977 to 1979 and 1985 to 1989\90 and the rural recession of 1970 to 1975 and 1990 to 1993. This period is also a time when NSW farmers and graziers, with debt, were paying the highest interest rates for borrowed funds. From 1985 to the peak in bank overdraft rates in 1989, interest rates ranged from 15.5% to 22%. This was a significant increase over the pre 1985 rates of 12 to 14%. Rates declined to pre 1985 levels after 1991 (Reserve Bank Bulletin, 1992).

All land transfers from 1975 to 1990 were manually collected for each of these LGAs (Notices of Transfer). For the period 1990 to 1995, sales were collected from a commercial real estate sales data base (R.P. Data). Table 2

ii) Crop Areas and Yields

Statistical data for the winter cereal plantings and yields for the three LGAs have been obtained from "Winter Cereal Production Statistics NSW 1922-1994" (Fitzsimmons, 1996).

iii) Commodity Economic Data

In order to analyse the trends in land use, it was necessary to compare the performance of the various LGAs on a per hectare basis. These comparisons are based on ABARE data (Australian Commodity Statistics and Farm Surveys, 1992, 1996) and State Bank Farm Economic Estimates. An average annual cropping yield(wheat, oats and barley) was determined for each of the LGAs. Interest rates are based on the term loan reference rate as published in the Reserve Bank of Australia Bulletins.

To provide a more realistic comparison for returns an

Table 2: Summary of LGA Average Land Prices ($/ha)

Year	Weddin	Lachlan	Cobar	year	V eddin	Lachlan	Cobar
1975	167	89	3.80	1985	481	288	68
1976	192	92	4.60	1986	542	263	18
1977	215	90	3.90	1987	535	198	23
1978	281	108	4.90	1988	808	222	20
1979	313	138	4.00	1989	796	259	26
1980	399	140	5.50	1990	620	275	76
1981	515	157	9.10	1991	694	243	32
1982	558	164	7.90	1992	879	217	82
1983	586	235	27.40	1993	737	228	67
1984	605	299	31.00	1994	816	223	117

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allowance was made for the difference in the cost of farm machinery between a grazing and a cropping enterprise. Table 3

RESULTS AND DISCUSSION

a) Land Use Change and Commodity Prices

Cobar LGA has seen a significant increase in both the total area sown to crops and the change in crops sown from oats to wheat. For Cobar LGA, a total area sown to winter cereal crops was 11,657 ha in 1975 compared to a record planting of 46,090 ha in 1983. Although this is still not a large area in comparison to traditional cropping areas it is a large increase on the average sowings of 600 ha for this LGA in the early 1960s Each of the subject LGAs had record areas planted to crops in the mid 1980s, but these areas have also seen a decline in the areas planted to winter cereal crops since 1985; for the three LGAs, these have been Weddin (-9.5%), Lachlan (-5.8%) and Cobar (-4.7%).

These figures suggest farmers are only basing their farm program on previous seasons prices rather than determining a farm program on the basis of an enterprise mix that will optimise net profit rather than gross income. A program based only on the price of the commodity alone may not maximise farm returns. This is further emphasised when varying seasonal conditions can result in uncertain yields. See graph 1.

b) Production Returns and Profitability

Rural land prices in this region of New South Wales (refer to tables 2 and 4) show a significant correlation to changes in the price of wheat (Eves, 1997). However a high wheat price does not always reflect overall farm returns and profitability as these are also a function of the areas sown, total yield and the cost to plant these crops.

The first comparison on the basis of cropping alone indicates that the higher yield potential of the traditional cropping areas such as Weddin LGA, and to a lesser extent, Lachlan LGA, ensure that this farming enterprise is profitable and sustainable in the long term. The average annual cropping income (adjusted net profit) for Weddin LGAs of $121 is twice the average annual income from cropping in Lachlan LGA and three times greater than Cobar LGA. The higher standard deviation of income (69.3) in Weddin can be explained, to some

Table 3: Annual Commodity Prices: 1974-94

YEAR	PRICFIT \%111::Ar	PRIC'MC W001	YEAR	PRIG `FJI' WYHFYT	PRICFJIiC WOOL
1974	89.1	1.81	1985	121.8	3.18
1975	84.2	1.27	1986	104.6	3.42
1976	76.8	1.43	1987	127.4	3.95
1977	76.6	1.82	1988	153.4	6.32
1978	99.6	1.87	1989	143.4	6.47
1979	118.6	2.05	1990	92.5	5.55
1980	128	2.44	1991	148.8	4.13
1981	119	2.5	1992	149.2	3.58
1982	150.8	2.64	1993	121.6	3.13
1983	132.2	2.7	1994	172.8	3.3
1984	127.9	2.94			

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Graph 1: Annual Percentage Change in Commodity Prices

The rapid growth in cropping, within the Cobar LGA, corresponds with increasing winter cereal crop prices and increasing yields for these crops in the more established cropping areas.

Table 4
Summary Percentage Average Annual Change in Land Prices and Cropping Income: 1975-95

	NVeddin	Lachlan	Debar
Percentage Change Land prices (Nom)	10.24	6.08	38.17
Percentage Change Land prices (Real)	2.28	-1.16	30.21
Standard Deviation Land Price Change	16.46	15.34	80.78
Av. Annual Adjusted Net profit	$121.20	$69.20	37.8
Standard Deviation Adjusted Net Profit	69.6	45.4	42.7

extent, by the lower yields and sowing areas in 1994.

In both Weddin and Lachlan LGAs the level of cropping has remained stable, with some annual variations due to farmers reacting to changes in price levels. Although Cobar LGA shows a similar trend, on a per hectare adjusted net profit, for wheat it is from a lower base and has a greater number of annual losses compared to the other two LGAs, which only returned an adjusted net loss result in 1982.

The volatility of this per hectare cropping adjusted net profit for Cobar LGA is also reflected in the volatility of the land prices for this LGA (refer to Table4). This table shows a % change in land price per hectare of 247 following both a high nominal price for wheat a considerable lower price for the previous year. Although all LGAs experienced this increase in wheat prices, both Weddin and Lachlan LGAs had only modest land price increases in the following year (8.3% and 4.5% respectively).

c) Land Prices: Commodity Price or Net Profit

Wool Production v Crop Production

Having established the average

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Table 5: Cobar LGA Annual Adjusted Net Profit/ha ($)-1975-1995

	Wheat	Wheat's	'tx►i
Average Annual Adjusted Net Profit	$37.80	$14.20	$14.48
Standard Deviation Profit	42.66	46.63	5.58

Wheat*: This column has been based on the annual wheat price and yields but further adjustment has been made to reflect the additional development and capital expenditure costs required for this land use, in comparison to wool production in Cobar LGA.

adjusted net profit for cropping on a per unit basis, calculations were made to determine the average annual adjusted net profit for wool production, on the same land, over the same twenty year period. The income included both wool and livestock sales. The initial comparison shows that, although wheat production resulted in the highest income per hectare this was offset by several years of negative returns. The highest annual adjusted net profit for wool per hectare was $26.51 compared to cropping of $96.00. The lowest adjusted net profit obtained for wool was $6.91 but wheat had one loss of $67.00. In fact the wool adjusted net profit was more reliable, showing a steady rate of growth up to 1986 with one rapid increase in price from 1987 to 1990 with a corresponding fall from 1991 to 1994. Based on the price of cereal crops alone the change in land use was justified, however at this point in the analysis there has been no consideration for the development and maintenance costs for the higher land usage and the long term cost on the environment for this unsustainable land use. (Refer to table 5:)

Grazing is a relatively low capital enterprise but cropping has a high capital cost. For the purpose of a more realistic comparison of overall profitability per hectare, an annual cost was calculated for the initial cost to clear this particular land and the cost for the difference in the levels of expenditure on machinery and specialised improvements. Table 5 shows the adjusted net profit per ha for cropping. On this basis, after allowing for these additional on going costs, the return for cropping drops significantly and in fact shows that the net profit was negative for nine of the twenty years and overall a higher profit would have been made if the production had remained as wool only. The risk for the average adjusted net profit from wool is also significantly lower at 5.58% than cropping at 46%. (refer to Table 4). The high risk of achieving these average returns are also reflected in the volatility of land prices in the Cobar LGA. (refer to table 4)

Correlation Analysis

Previous studies by Edwards (1994) and Eves(1996) have established a correlation between changes in the price of rural commodities and changes in rural land prices, this correlation is based on a lag period of 12 months on the land price. This lag is based on the assumption that a high or low commodity price, similar assumption for farm profit, will not be reflected in land prices till the next year, especially as crop income is received in December (refer to Table 6).

This correlation, in New South Wales, is particularly relevant in relation to wheat. Again, this is indicated in Table 6 for the Weddin LGA. An analysis of the return per hectare for cropping was also carried out on the basis that actual farm income should also be a determinant of rural land prices and a farmers decision to buy or sell rural land (assuming there is no alternate non agricultural use for the land).

Tables 7 to 9 suggests that there is some correlation between the annual income (adjusted) generated from land within the subject study areas and movements in land prices within these same areas, especially in the more marginal areas. This correlation is less in the safer

traditional cropping areas where there is a greater correlation between land prices and wheat prices rather than adjusted net profit. This indicates that farmers, in good farming areas, are more likely to base their land purchase decision on commodity prices rather than the overall earning capacity of the land. However, as the rural land becomes more marginal with increased possibility of crop loss, the greater determinant of land price movement is the adjusted net profit of the previous year. Table 6 suggests that the correlation, in land prices, reduces as the distance between the areas increases. The variation in these cases is a function of the varying yields between the areas, which in turn is a function of climate, soil type and topography.

Despite the impact of interest rates on farm profitability, there was limited correlation between changes in the interest rate and changes in land prices.

Table 6: Correlation: Land Prices and LGA Location

	NW'eddin	Lachlan	t°okra�°
Weddin	1.00		
Lachlan	0.10	1.00	
Cobar	0.11	0.06	1.00

Table 7: Correlation Analysis Weddin LGA

	Land Price	Net Profit	Wheat Price	Wool price	Int. Rate
Land Price	1.00				
Net profit	0.30	1.00			
Wheat price	0.39	0.13	1.00		
Wool Price	0.05	-0.08	0.04	1.00	
Int. Rate	0.18	-0.14	0.21	0.01	1.00

Table 8: Correlation Analysis Lachlan LGA

	Land Price	Net Profit	Wheat Price	Wool price	Int. Rate
Land Price	1.00				
Net profit	0.67	1.00			
Wheat price	0.20	0.13	1.00		
Wool Price	-0.13	-0.08	0.04	1.00	
Int. Rate	-0.12	-0.14	0.21	0.01	1.00

Table 9: Correlation Analysis Cobar LGA

	Land Price	Net Profit	Wheat Price	Wool price	Int. Rate.
Land Price	1.00				
Net profit	0.37	1.00			
Wheat price	0.14	0.13	1.00		
Wool Price	-0.09	-0.08	0.04	1.00	
Int. Rate	-0.04	-0.14	0.21	0.01	1.00

RURAL VALUATION IMPLICATIONS

Rural valuation, in both Australia and New Zealand, has been predominantly based on the direct comparison method. The New Zealand Productivity valuation method has been one attempt to link the value of rural land to the actual income earning potential of the land based on the management of the operator. Despite the sound logic behind this methodology, valuers have been hesitant to adopt this as a primary valuation method (Hargreaves, 1984; Eves, 1996; Thomas, 1996). This is supported by the above data that indicates that not all rural land markets base land prices on the individual productivity of rural properties. Until all rural land market bases value on the income earning capacity of the individual farm rather than the price of commodities and the perceived profitability of a particular farming land use, a productivity valuation method will have limited correlation to the actual market. This analysis suggests that an income based valuation methodology would be more reliable in marginal farming areas which also tend to have less impact from non rural market influences such as hobby farms and alternate uses.

The correlation analysis confirms the current situation of farm buyers, in safe cropping areas, basing their purchase decision on the likely future gross income based on current commodity prices. This is contrary to the purchase and sale of other income producing property, where price is determined on historic trading with an allowance for future increases or decreases in trading levels.

The results from the above case study indicate that perceived increases in income by changing to a higher unit value enterprise may not always result in a corresponding increase in actual farm net profit. When valuing land where traditional agricultural land use is being changed to a more marginal land use, the valuer should consider the possibility that the increased cost in developing and maintaining this land use may not be reflected in the true value of the land based on the overall productivity of the new land use compared to the traditional land use.

Previous research on rural land prices has established that sales in one location can not be directly used as an indicator of land prices in another location, even if nearby (Eves, 1997).

It now appears that the decision to buy rural land, in some rural areas, is not directly related to the previous income earning performance of the land. It is more likely that land prices in safer rural areas, particularly those subject to alternate uses other than agriculture, will increase or decrease to changes in the price of the highest value commodity. Based on this analysis, the market will be more buoyant in times of higher commodity prices rather than periods of high farm net returns which are a function of commodity price, production yields and production costs. However, the reverse situation applies with rural land that is considered to be marginal and that is subject to considerable climatic risk. In these cases the farm profit derived from the previous year appears to be the best indicator of rural land price movement.

Until all the participants in the rural land market buy and sell or develop rural property on the

basis of what the land is actually returning or the most likely returns off the land, it will be unreliable to assess land prices in one area based on changes in land prices in another location if productivity is used as a basis for adjustment.

About the author
Chris Eves is currently lecuturing in rural land valuation at University of Western sydney. He has recently completed a Masters Degree from which this paper stems. Previously he spent 16 years working as a valuer for an Australian bank in New South Wales.

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