

Property Taxation in New Zealand

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with
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Abstract

Since European colonisation of New Zealand in 1840, property taxes have formed the foundation of local authorities' revenues. Currently, over half of local authority revenues are sourced from rates on property. The nature of the rating system has changed over history and today three different types of rating system are used within the country. The two dominant systems are levied on land value and on capital improved value (land, building and other improvements) respectively. For most of the twentieth century, the land value system was the dominant system used by local authorities, but since the mid-1980s the capital value based system has become increasingly prevalent. We outline historical developments in systems of property taxation in New Zealand including influences which led to changes in the systems over time. We then examine in more detail the modern funding systems stipulated for local government, together with the "toolkit" of funding options available to local authorities. Our paper concludes with an empirical examination of local authority revenue and expenditure patterns. Within this work, we uncover a pattern which relates choice of rating system to the level of mean income within local authorities.

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Property Taxation in New Zealand

Introduction

Since European colonisation of New Zealand in 1840, property taxes have formed the foundation of local authorities' revenues. Currently, over half of local authority revenues are sourced from rates on property. The nature of the rating system has changed over history and today three different types of rating system are used within the country. The two dominant systems are levied on land value and on capital improved value (land, building and other improvements) respectively.

In this paper, we outline historical developments in systems of property taxation in New Zealand including influences which led to changes in the systems over time. We then outline in more detail the modern funding systems stipulated for local government, together with the "toolkit" of funding options available to local authorities. Our paper concludes with an empirical examination of local authority revenue and expenditure patterns. Within this work, we uncover a pattern which relates choice of rating system to the level of mean income within local authorities. We leave an investigation of the causes of this pattern to further work.

Historical Developments

Currently in New Zealand local authorities have the choice of three alternative systems on which the real property tax or rates may be levied. These systems are (i) the total value of land, buildings and other improvements (capital improved value); (ii) land value only (previously known as unimproved value); and (iii) the annual rental value (also known as annual value). However, local authorities have not always enjoyed a choice between these three rating systems.

Provision for the rating and taxation of land and property was made from the earliest days of organised European settlement in New Zealand. In 1840, a treaty (the Treaty of Waitangi) was signed between the British Crown and the indigenous Maori tribes of New Zealand, with the Crown's intention stated in the treaty as being "to establish a settled form of Civil Government." Maori retained possession of their lands, forests and fisheries but ceded "all the rights of sovereignty" to the Crown. Two years later, in 1842, a Municipal Corporations Ordinance was passed which stipulated that any district with a population greater than 2,000 would be entitled to have a council with the power to make and levy rates. The Property Rate Ordinance of 1844 introduced a tax both on property and on income. The Municipal Corporation Ordinance, also of 1844, provided for rating in boroughs.

During the first decade of British colonization in the 1840s, annual value was the most extensively used basis for rating, which was in effect an adoption of the 'English system' of rates. By the mid-1850s all the main rating systems employed today had been adopted in one form or another by various local authorities under the then provincial system of regional government.

In 1852 the Constitution Act divided New Zealand into six provinces each with the power to raise funds through rates. In 1876 the provinces were replaced with counties, municipalities and road boards. With the abolition of the provincial system in 1876 the central government in the same year passed the Rating Act which was designed to achieve a uniform system of rating throughout the country. This act provided for annual value rating only. In just six years in 1882, the tide of opinion had changed and whilst the Rating Act authorised continuation of the annual value system it empowered local authorities to rate on capital value as an alternative. The effect of this statute was that almost all counties (rural areas) adopted capital value rating with the boroughs (urban areas) adopting an annual value system. The reasons given for the 1882 change were; (i) undeveloped land and land held for speculative purposes had no rental value but a definite market or capital value; (ii) farm improvements usually added more to the annual rental value than to the capital value; and (iii) the introduction of a national property tax based on capital justified the introduction of a common valuation and tax basis (Dowse and Hargreaves, 1999).

Land tax on the unimproved value of land came into being with the passing of the Land Tax Act 1878 which was repealed the following year by the Property Tax Act 1879. Valuation rolls were first compiled following the 1878 Act. Between 1879 and 1893 land tax was levied on capital values, but an amendment to the Property Tax Act in 1893 resulted in land tax being levied on unimproved values only. According to O'Keefe (1965) this seems to have been the genesis of the principle of rating on unimproved values. However, under the Rating on Unimproved Values Act 1896 ratepayers obtained the right of taking a poll to determine whether they should be rated on capital value, unimproved value or annual value.

The first major step towards the present day position was made in 1893 with the Rating Acts Amendment Act which provided for any local authority to choose by resolution either capital value or annual value as the basis for setting its rates. The unimproved value system interestingly was rejected by central government in 1893; however, its popularity had been on the increase since the depression of the 1880s. The depression engendered a wide-spread dissatisfaction with the existing social set-up and was responsible for the greater public interest in 'left-wing' political theories. It was against this background that the works of two liberal thinkers, the English philosopher, John Stuart Mill, and the American writer, Henry George, found ready support among the reformists. The ideas of the two philosophers had special relevance for the field of land taxation. Mill argued that since landowners received a gratuitous reward as the value of their landholdings increased with the progress of the community, there should be a special tax imposed on land to allow the community to share in the values it had created. George reasoned along similar lines that this unearned increment should be the only form of taxation since it did not penalise landowner's efforts to improve their property.

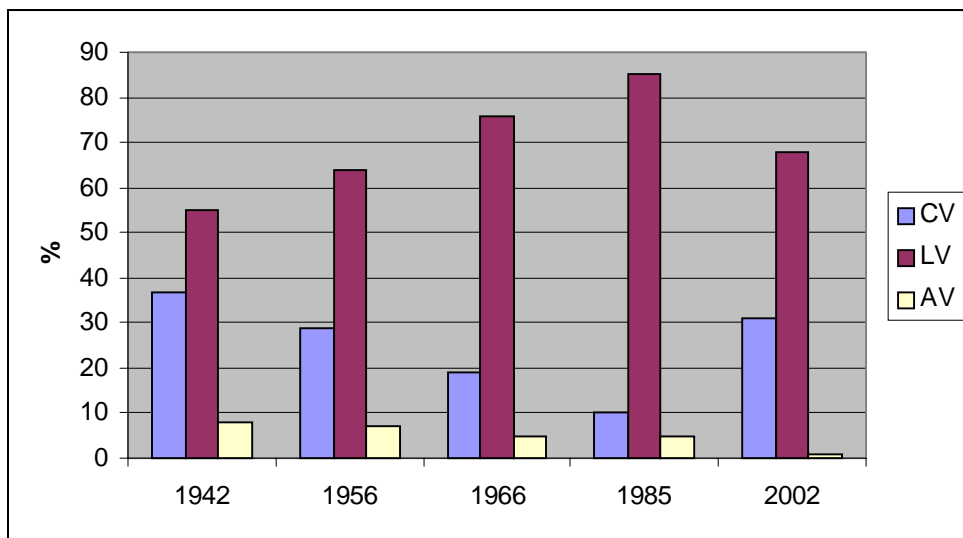
The early 1890s saw public opinion ready to accept the principle of a tax based on the unimproved value of the land. Then in 1891 the national property tax was modified to give partial exemption to improvements and in the following year full exemption was granted. These developments in general taxation were followed by similar changes in local taxation, and in 1896 the Rating on Unimproved Value Act was passed which made the unimproved value system the third option open to local authorities.

However, the local authority could only change to unimproved value if the proposal was first approved by a poll of ratepayers. Similarly, once unimproved value had been adopted as the basis for rating it could only be abandoned with the support of ratepayers.

Also in 1896 the Valuation of Land Act was passed which is important from the perspective that it defined the terms of unimproved and improved value. The improved value was in essence the self-created value, while the unimproved value was that value created by the community and the value of the land in its 'original' condition. (A conceptual change took place in 1970 when the term 'land value' effectively replaced 'unimproved value' as the basis for rating valuations.)

After 1896, with the advent of three recognised systems of rating available to local authorities, there was a steady move away from annual value and capital value rating to unimproved value rating. By the Second World War, land value based rating had become the dominant system and this trend continued through to the 1980s. However, since 1985 there has been a noticeable swing back towards the use of capital improved value. This is more evident within the larger urban areas. Figure 1 illustrates the movement in the usage of the three main tax bases since 1942.

Figure 1: Rating Systems used by Local Authorities (% of Authorities)



Up until 1976 local authorities could switch from capital value to annual value rating systems without reference to ratepayers, but any change in adopting or abandoning land value required a majority poll of ratepayers. At present local authorities can change the rating system without recourse to a taxpayer poll; however, public consultations would normally take place.

Figure 2: Local Authority: Rating Systems

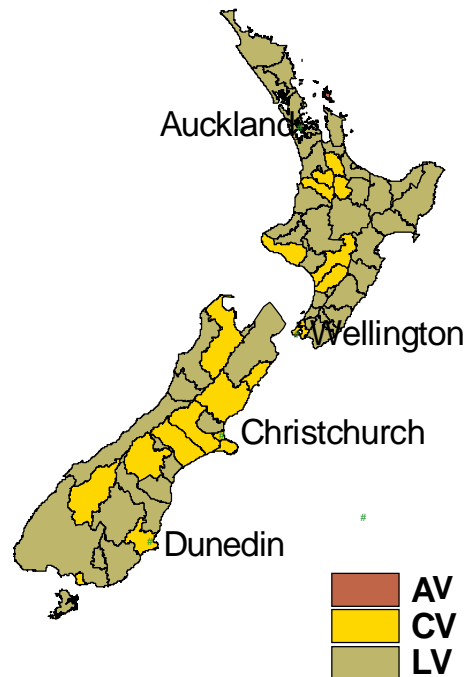


Figure 2 illustrates the geographic distribution of local authority rating bases. Land value systems tend to be more widely used in the (more densely populated) North Island. The traditional "main-four" cities of Auckland, Wellington, Christchurch and Dunedin all have adopted capital or annual value rating systems. Later in this paper, we investigate the choice between capital/annual value and land value rating systems in more detail.

The Modern Funding of Local Government

In July 1996, the government introduced legislation supporting new financial management provisions for local authorities which came into force in July 1998. The government was also conscious that there was a need to redesign local government's funding tools in line with the new provisions. It was felt that the previous legislation, The Rating Powers Act 1988 (RPA) was overly prescriptive and lacked clarity and consistency. To address these concerns a Review of Local Government Funding Powers was initiated to develop a comprehensive, coherent, and flexible legislative framework of funding powers for councils.

The resulting Local Government (Rating) Act 2002 replaces the Rating Powers Act 1988, and relates to powers to set, assess and collect rates to fund local government activities. The primary intention of this legislation was to update and simplify existing rating powers to meet the needs of modern local authorities. The Act provides greater

flexibility for local authorities as they determine how to raise revenue through rates. It does not directly affect the amount of money that will be collected through rates, as this is established through funding policy processes under the Local Government Act 1974. In essence, the Act provides local authorities with significantly wider and more flexible options as to how they spread liability for rates across ratepayers in their jurisdiction. Mechanisms and powers are set out in the Act to allow local authorities to raise revenue from the community generally, from specified groups or categories of ratepayers, and from those who use or generate the need for particular services or amenities.

Essentially the Act has three main purposes:

- (i) to provide local authorities with flexible powers to set, assess, and collect rates;
- (ii) to ensure rates reflect decisions made in a transparent and consultative manner; and
- (iii) to provide for processes and information to ensure ratepayers can identify and understand their liability for rates.

The financial management provisions in the current Local Government Act essentially provide for:

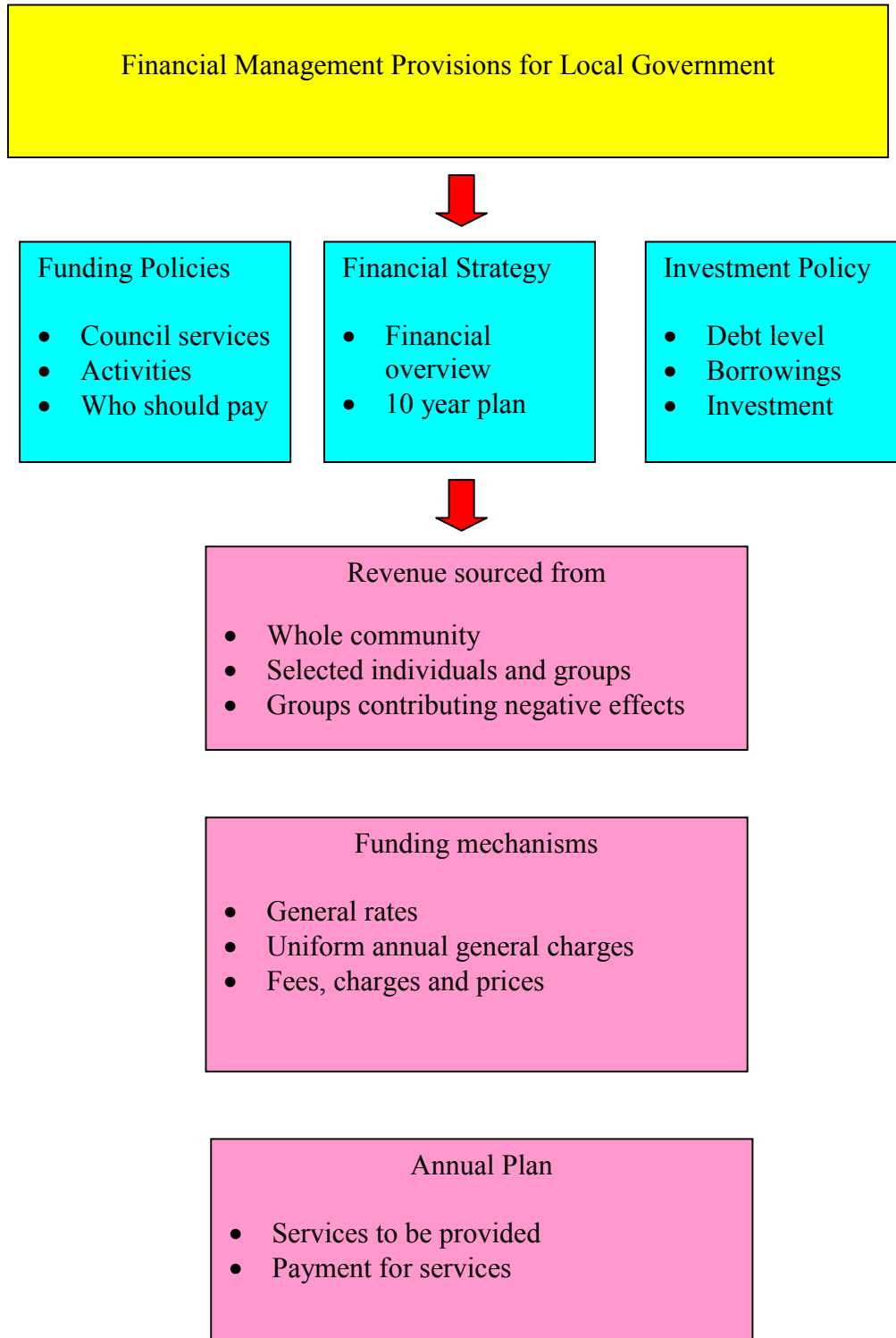
- a long term financial strategy which covers a 10 year period and includes information on the services the council proposes to deliver, the cost of those services, how they will be funded and information on the overall financial position of the council;
- a funding decision process that sets out the decision making process and criteria that councils must use when deciding how to fund services;
- borrowing and investment policies;
- an annual plan that sets out the services that a council proposes to deliver for a particular year including costs and funding arrangements; and
- an annual report that sets out the performance of the council and its overall financial position.

The funding policy of a local authority seeks to achieve a systematic review of the funding mechanisms for all activities or functions of the council so that the funding is derived as closely as possible from the beneficiaries of those activities or functions. Essentially, there are three main types of benefits/expenditure:

- that which is independent of the number of persons who benefit from the expenditure, or generates benefits which do not accrue to identifiable persons or groups of persons, or which generally benefits the whole community (general benefits);
- that which provides direct benefits to persons or categories of persons (direct benefits); and
- that which is needed to control negative effects caused by the action or inaction of persons or categories of persons (negative effects).

Figure 3 provides an overview of the key components of a local government financial management strategy as required under the current Local Government Act 1974.

Figure 3: Financial Management Provisions of Local Government



The Revenue Funding Toolbox

The funding toolbox available to local authorities is effectively a range of revenue raising mechanisms designed to create a transparent and accountable decision making process distinguishing:

- functions it wishes to fund by spreading the cost across the community as a whole (public good expenditures); and
- those functions which it wishes to fund in a more targeted way from particular groups benefiting from those functions (private good expenditures).

A toolbox consistent with the aims of this process requires:

- a set of tools for raising revenue across the community in general - in effect, powers to tax; and
- one or more sets of tools for funding particular functions by those benefiting from particular services - involving a range of possible fees, charges and prices.

Different principles are normally applied to the design of taxes, fees, charges and prices within the arena of local government finance. The design of a taxing power needs to have specific regard to generally accepted principles of taxation, such as efficiency, fairness and equity, while powers to impose fees, charges and prices are more appropriately designed by reference to principles of efficient pricing.

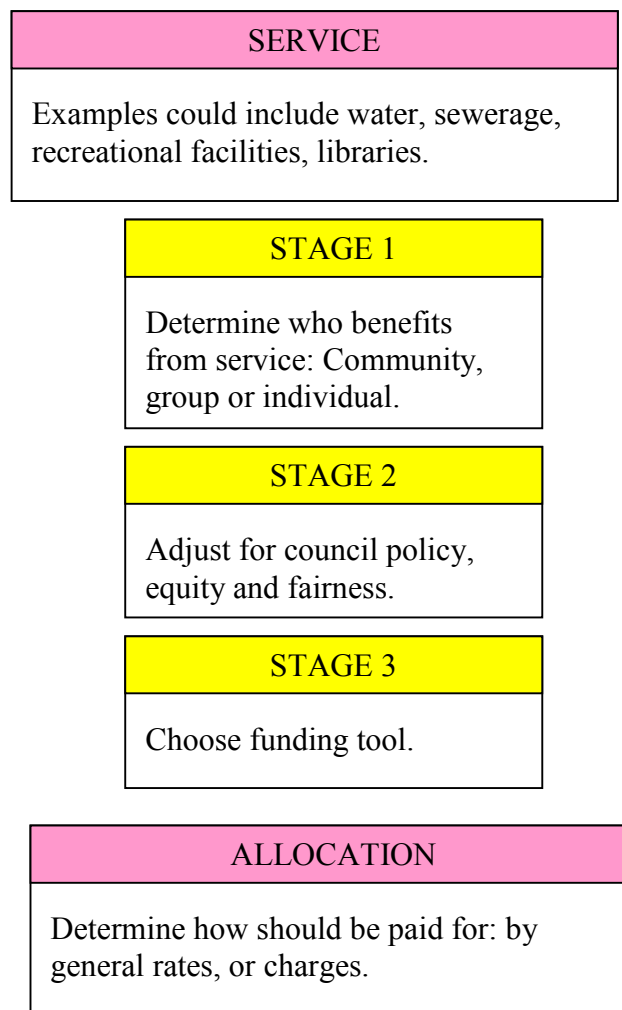
It is recognised that it is not always practicable or efficient for all functions which give rise to private benefits to be funded by pricing (that is, where individuals pay directly for the quantity of a good or service which they purchase). There is an additional range of tools which allows the funding of expenditures to be borne by the identified groups who benefit from these functions. These tools are generally referred to as “targeted funding tools”. In some circumstances these may be both a fairer and more efficient option for funding functions that give rise to private benefits, than reverting back to use of a general taxing power. Familiar local authority funding tools such as separate rates and uniform annual charges for particular functions fall within this group, as does the current charge for sewerage on a per pan basis. The principle sources of revenue (including borrowing) are detailed in Table 1.

Table 1: Main Sources of Revenue for Local Authorities

<p><i>Sources of revenue:</i></p> <p>General rates</p> <p>Differential rating</p> <p>Uniform annual general charges</p> <p>Targeted rates and charges</p> <p>Fees and charges</p> <p>Interest and dividends from investments</p> <p>Borrowing</p> <p>Proceeds from the sale of assets</p> <p>Development contributions</p>
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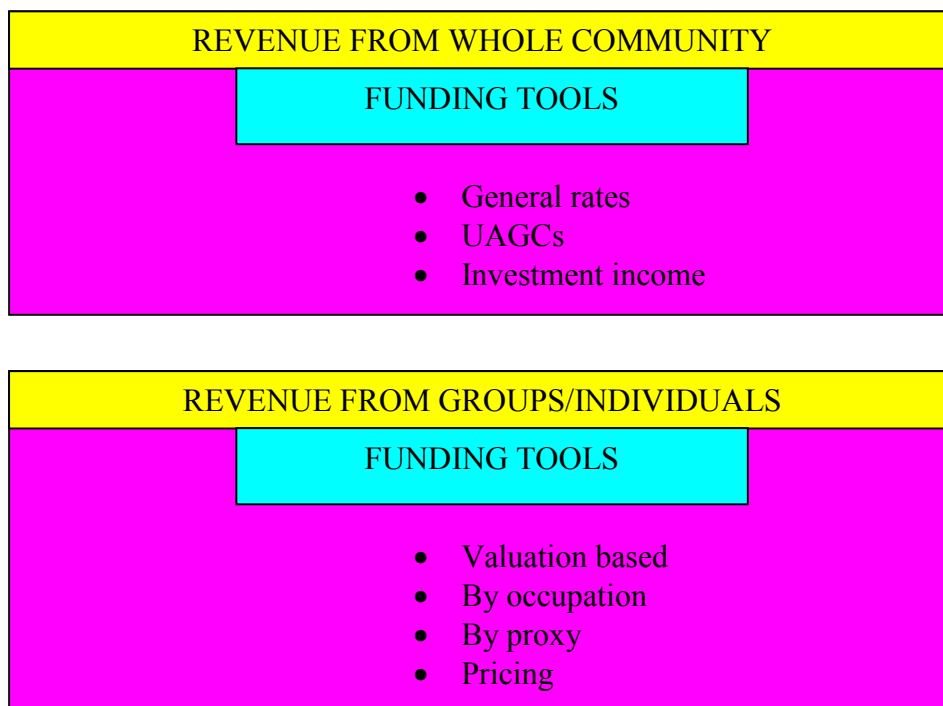
Under the Local Government Act 1974 and the Local Government (Rating) Act 2002 local government must develop a revenue policy and financing policy and must state the funding of both operating and capital expenditures. In essence local authorities are required to link funding policies and funding powers in order to create a transparent process for the payment of council services. The objective is to determine who benefits from a particular service (community, group or individual), make adjustments for council policy, choose the funding tool(s) and then to assess how much of the cost of a service is to be paid by the community and/or individuals. Figure 4 illustrates the process.

Figure 4: Activity Based Funding Process



Property rates are the principal revenue source used to fund the cost of council services in proportion to the total community based cost. The rating component incorporates the general rates as well as differential rates. However, councils have been empowered to apply direct user charges for services. In addition, where direct charging or pricing of the service is not appropriate councils have the option to apply targeted funding tools. Figure 5 illustrates the mix of funding options available to local authorities.

Figure 5: Main Funding Tools Available to Local Authorities



General Rates

General rates are the preferred funding tool where benefits do not accrue to individuals. The general rate has a certain degree of flexibility in that local authorities have the power to vary the level of the rate over different parts of the district. The ability to modify rates by location is thought appropriate because councils are generally responsible for a range of public good functions that are specific to different geographic areas. In addition, there is the capability to vary the general rate according to type or use of property.

The basis for the general rate is currently a matter for each local authority to decide. Even if a uniform system were to be imposed upon local authorities with regard to the general rate it would seem likely that all the current valuation bases, (land value, capital value, annual value) would remain available for the use of targeted rates as a funding tool to target more specific patterns of benefit for specific functions.

Differential Rating

The ability to make rates differentially is a potentially valuable tool in targeting the funding of particular functions. Differentials are traditionally thought of as variations on value based rates. However they can also be seen as a type of purpose designed proxy (albeit one which must be linked to values). They are like proxies because they are levied/charged on specific properties based on type, use or some other characteristic.

Differential rating enables a council to levy rates so that rates made in respect of any one or more specified types or groups of property may vary from those rates made and levied in respect of another specified type or group of property. Essentially, differential rating allows a council to develop a rating system which recognises the vagaries of valuation (in relation to types or groups of properties as opposed to individual properties). In addition, the council can reflect more fairly the rate burden across groups of properties by such factors as type, location etc. The system is seeking to ensure that different groups of property (residential, commercial and rural) each contribute the same proportion of rates over time. It is often argued that the commercial group should bear a disproportionately greater share of the rates burden than other groups because:

- rates are a tax deductible expense and businesses can claim back GST¹;
- Businesses can affect the real incidence of rating by effectively passing on the cost to customers;
- Businesses receive a higher level of service than other groups.

It can also be argued that differentials should be used to ensure that the rates levied on a particular group actually reflect the services received by properties in that group. This could be an argument for having a lower differential for the rural sector.

It is important to recognise the fact that all groups of ratepayers or properties actually form part of the whole community. The degree to which it is sensible to dissect a community into differentially rated parts must be considered and a holistic view adopted.

Uniform Annual General Charges

The ability to have a flat per property tax, such as the uniform annual general charge (UAGC) allows councils to recover costs across whole communities. The flexibility of having both UAGCs and a general rate in the funding toolbox allows local authorities to much more closely design the impact of their funding systems to meet the perceived wishes of local communities. A UAGC per property tax also allows councils to set a de facto minimum rate so that even those with very low value properties make a minimum contribution to the funding of local public goods.

A flat per property tax also allows a number of equity objectives to be achieved. For instance it can ensure that ratepayers pay for public good functions more equally. However, there are a number of problems surrounding the application of UAGCs such as:

- the distortionary effects of such a tax, whereby land tenure can be arranged to avoid 'per property' taxes while value based taxes cannot be avoided in the same way;
- equity and fairness effects, especially as flat per property taxes may be regressive and impact more heavily on poorer households;

¹ GST (Goods and Services Tax) is a comprehensive nationwide value added tax.

- flat taxes blunt accountability by limiting how much those with high value properties pay.

Currently there is a cap (expressed as 30% of certain types of revenue) on the use of uniform charges, excluding those for water and sewerage. The current cap was inserted as a restraint on the use of a tax mechanism seen as regressive.

Targeted Rates and Charges

Targeted funding tools are funding instruments where payment is by a compulsory tax, but liability only arises from the use, consumption or availability of services. They represent a middle ground between:

- taxes where payment is compulsory without relation to the consumption of services; and
- prices which are voluntary upon consumption of the services.

The legislation contains a single, flexible generic targeted rate power, which replaces the previous range of separate rate and charge powers available. Flexible, targeted charging mechanisms can be best used to target those who generate costs or benefit from functions. They in effect fall between the tax mechanisms for recovering costs across the whole community and prices charged to individuals. The key purpose of the provisions for targeted rates is to allow councils to align the nature of a service provided more closely with the manner of rating for that service. The provisions allow more flexibility than the previous system of separate rates. A local authority may set a single targeted rate for several functions, or several targeted rates for a single function.

Annual plans will be required to identify which categories of ratepayer are to be liable for each targeted rate, and how the amount of each rate is to be calculated. Matters that may be used to identify categories of ratepayer for this purpose are specified in the Local Government (Rating) Act 2002 (Schedule 2). Factors that can be used to determine liability are also listed in the Act (Schedule 3).²

A flexible range of powers for targeted charging is essential particularly where the use of prices or general rates is not possible or appropriate. The powers include:

- valuation based rates (land value, capital value, annual value, and improvements);
- charges on units of occupation or ownership (such as separate households);and
- other proxies for use or benefit (possible examples include land area or street frontage).

Examples of the targeting tools are detailed below.

² The Local Government (Rating) Act 2002 is available electronically from: <http://rangi.knowledge-basket.co.nz/gpacts/public/text/2002/an/006.html>

Valuation Based Rates

Valuation based rates on land, capital, or annual value, or value of improvements, could be levied. They could be applied to an area or areas defined by any geographic description.

Units of Ownership or Valuation

Separate properties, with modifications related to multiple titles could form the units for a flat per property tax. Household units could possibly be used to charge for a wider range of functions than just refuse and water as at present.

Specific Proxy Charges

Specific empowering provisions could be included for types of proxy charges which councils are highly likely to use. Possible examples include land area or street frontage or toilet pans.

Purpose Designed Proxies

General provisions could also be made for councils to design proxy charges to suit their particular circumstances. Councils can use this power to charge according to some measure which acts as a proxy for the costs imposed or the benefit received from a function. For example a council constructing a sea wall to protect a number of properties might wish to charge for it per square metre of property protected.

Factors that may be used in calculating liability for targeted rates include;

- The annual value of the rating unit
- The capital value of the rating unit
- The land value of the rating unit
- The value of improvements to the rating unit
- The area of land within the rating unit
- The area of land within the rating unit that is sealed, paved, or built on
- The number of separately used or inhabited parts of the rating unit
- The provision of any service to the rating unit by the local authority, including any limits or conditions that apply to the provision of the service
- The number or nature of connections from the land within each rating unit to any local authority reticulation system
- The area of land within the rating unit that is protected by any amenity or facility that is provided by the local authority
- The area of floor space of buildings within the rating unit
- The number of water closets and urinals within the rating unit
- The number of visitor stay units within the rating unit.

The general power for targeted charging meets a number of concerns previously expressed by councils about gaps in charging powers. More generally it allows innovation in charging to match patterns of cost or benefit of services and reduces the pressure for legislation to confer new or altered charging powers.

Pricing and Charging

A general pricing power provides for councils to:

- recover appropriate economic costs;
- apply efficient pricing principles; and
- have regard to the purpose of the legislation governing the function being charged for.

The previous range of pricing and charging powers available to local authorities was often unduly prescriptive and prevented local authorities from recovering full and/or appropriate costs from users. A general pricing power, supplemented by pricing and costing guidelines, provides local authorities with greater flexibility in setting prices while also ensuring that such prices are efficient and appropriate.

Local Government Revenue & Expenditure

Local authorities must make decisions both on their total expenditure and revenue each year and, given their expenditure choices, on their funding methods, using any of the tools available within the "funding toolbox" outlined above. Further, as well as choosing how much is to be raised through rates, a decision has to be taken (or reviewed) periodically as to the type of rating system that is to be used (land value, capital value or annual value). Here we investigate these issues empirically in more detail.

Revenue and Expenditure

Table 2 provides data on the principal revenue sources utilised by local authorities for the five years to 2001. Per capita revenue data in both nominal and real (2001 dollar) terms, together with total local authority revenue and expenditure data are also provided.

The importance of rates within local authority revenue budgets is evident, providing over half of all revenue in each year. Also evident is the relative stability of funding sources over time.

Table 2: Local Authority Revenue Sources (% of Total Revenue)

Year ending June:	1997	1998	1999	2000	2001
Sources:					
Rates	56.3	55.6	54.9	56.1	57.1
Petrol Tax	0.7	0.7	0.7	0.7	0.7
Sales Income	20.4	19.1	19.0	18.9	19.1
Grants & Subsidies	10.2	10.7	10.8	10.6	10.3
Investment Income	7.7	9.2	10.3	8.9	7.8
Fees & Fines	4.6	4.6	4.4	4.8	5.0
Memorandum Items:					
Total Revenue (NZ\$mill)	3,343.0	3,456.9	3,626.4	3,749.6	3,846.9
Revenue per cap. (NZ\$)	884	906	945	972	991
Revenue per cap. (2001 NZ\$)	943	950	995	1,003	991
Total Expenditure (NZ\$mill)	3,252.6	3,321.9	3,466.4	3,508.5	3,620.3

Source: Statistics New Zealand

Real (CPI-adjusted) per capita local authority revenues have exhibited considerable stability over time, rising at an average rate of just 1% p.a. over this period. (For comparative purposes, the average annual local authority revenue per person over the 1997-2001 period³ equates to US\$483.) In each year, total local authority revenue exceeds expenditure, with the expenditure:revenue ratio averaging 95.3%. Thus local authorities, in aggregate, have not experienced any obvious funding crises over recent years.

Choice of Rating System

Within the rating revenue category, we have already observed the trend towards a land value rating basis through much of the twentieth century followed by a partial switch back towards a capital value basis since the mid-1980s. Here we test for differences between local authorities that employ capital value rating versus land value rating systems.⁴ Future research⁵ will investigate the effects of alternative rating systems on the size and stability of local authority revenues in more detail.

Earlier, we noted that the traditional "main-four" cities in New Zealand (Auckland, Wellington, Christchurch and Dunedin) all utilise a capital (or annual) value based rating system whereas land value is still the predominant rating system throughout the country. *Prima facie*, this may suggest an urban-rural split between rating systems. However, the reality is more complex.

Dunedin, traditionally the fourth largest city in New Zealand, only shifted to capital value rating in 1989. By that time, it had been superseded in size by Hamilton which

³ The average is taken to even out the effects of exchange rate fluctuations over the period.

⁴ Unless otherwise specified, we include the one local authority which uses an annual value rating basis together with those employing a capital value rating basis, given the economic similarities between the two systems with both taking account of the value of improvements in setting the rating base.

⁵ This ongoing research is being funded by the Lincoln Institute of Land Policy.

has continued to grow considerably more quickly, establishing itself as the country's fourth largest city. Hamilton, heart of a rich farming district, continues to utilise a land value based rating system. One hypothesis which might explain this retention (if there were an urban-rural split in rating systems) is that Hamiltonians still see themselves as more rural than urban. However that hypothesis would not explain why a neighbouring, rural local authority (South Waikato District) switched from land to capital value rating in 1993. Further, four local authorities within the greater Auckland conurbation (North Shore City, Waitakere City, Manukau City and Papakura District) all retain land value rating.

We have investigated, using more formal methods, whether there are differences between those local authorities that use capital versus land based rating systems. If there are significant differences, that may inform us as to the perceived strengths and weaknesses of each type of rating system for local authorities with different characteristics. If there are no statistically significant differences, it may be the case that there is a material lag between recognising the desirability of changing the rating system and actually implementing a rating system change.⁶ If that is the case, the average characteristics of authorities with alternative systems may not differ materially, but the characteristics of those that change systems may differ markedly from those that do not change. We therefore also investigate whether those authorities that have changed from land to capital value rating differ from those that have chosen to retain land value rating.

Our empirical analysis of the characteristics of local authorities using alternative rating bases is conducted over 3 years (1991, 1996, 2001) which coincide with nationwide censuses. From the censuses, we obtain information for each local authority on population density and mean income of the population. We have also independently compiled a database of rates revenues, total revenues, and total expenditures (broken into discretionary and non-discretionary expenditures) for each local authority for which the information is available. Pooling this information for the 74 territorial local authorities (TLAs) over the three years gives a potential 222 observations. In practice, some of the rates and expenditure information is incomplete, but all of our analysis below is based on at least 172 observations. Where necessary (i.e. for the mean income, revenue and expenditure variables) our data is deflated by the Consumers Price Index; year dummies are introduced to allow for differential expenditure and/or rating effects across years (but are not reported)⁷; logarithms are natural logarithms.

While revenue and expenditure decisions are interlinked, it is helpful in studying the rating choice to think of expenditure as being predetermined with authorities then having to choose a rating system and other revenue-raising methods to fund this expenditure. In equation (1) below, we regress total per capita expenditure (TE) of each authority in each year on two characteristics of that authority: its population density (PD) and its mean income (MI). We hypothesise that more densely populated

⁶ We are not implying that one system is more appropriate than another for certain local authorities. An investigation of the effects of different systems on different types of local authority is left to future work. Here we are simply documenting any differences between local authorities that have made different rating decisions as a basis for future analysis.

⁷ In almost all cases they are not statistically different from zero at the 10% level, implying no significant change in the constant term across the 10 years included in the study.

authorities enjoy some economies of scale in provision of services and so, *ceteris paribus*, have lower per capita expenditures relative to less densely populated authorities; thus we expect a negative coefficient. We also hypothesise that as mean income rises, the population demands greater services and thus, *ceteris paribus*, per capita expenditure (and particularly discretionary expenditure) will rise; thus we expect a positive coefficient. (In reporting the equations, we include standard errors below coefficients in brackets; *** denotes significant at the 1% level, ** denotes significance at 5%, and * denotes significance at the 10% level.)

$$\begin{aligned} \log TE = & -0.086 \log PD + 0.995 \log MI - 10.198 & (1) \\ & (0.021)^{***} & (0.376)^{***} & (3.810)^{***} \\ n = & 194 & \bar{R}^2 = & 0.078 \end{aligned}$$

The results in (1), while leaving considerable variation in authorities' expenditures unexplained, are consistent with our hypotheses outlined above. A ten percent increase in population density appears to enable authorities to reduce per capita expenditure by almost one percent. Local authority expenditures have a unit elasticity with the mean income of the population indicating that local authority expenditures are on the border between being viewed as a luxury and as a necessity.⁸

Given the level of expenditure, we find, consistent with our postulated approach, that per capita rates revenue (RR) is linked strongly to per capita expenditure:

$$\begin{aligned} \log RR = & 0.681 \log TE - 1.132 & (2) \\ & (0.070)^{***} & (0.376)^{***} \\ n = & 174 & \bar{R}^2 = & 0.351 \end{aligned}$$

The elasticity of rates revenue with respect to expenditure is less than one, indicating that as expenditures increase, rates revenues become a smaller proportion of total revenue.

The findings of these two equations are in accordance with intuition. Of greater relevance to this study is the link between revenues, expenditures and their determinants with alternative rating systems. We supplement each of equations (1) and (2) with a dummy variable (CV/AV) taking the value of 1 if an authority has either a capital or an annual value basis for its rating system, and taking the value of 0 otherwise (i.e. if it uses a land value basis). Equations (3) and (4) respectively report the results.

$$\begin{aligned} \log TE = & -0.059 \log PD + 0.049 \log MI + 0.397 CV/AV - 0.751 & (3) \\ & (0.021)^{***} & (0.401) & (0.082)^{***} & (4.051) \\ n = & 192 & \bar{R}^2 = & 0.156 \end{aligned}$$

⁸ When expenditure is disaggregated into discretionary and non-discretionary expenditure, the former has a considerably higher income elasticity than the latter, as may be expected.

$$\log RR = 0.740 \log TE - 0.032 CV/AV - 1.104 \quad (4)$$

(0.074)*** (0.087) (0.065)***

n = 172 $\bar{R}^2 = 0.389$

Equation (3) explains considerably more of the variation in per capita expenditure than does equation (1) and the highly significant coefficient on the CV/AV term indicates that local authorities with capital value rating systems tend to spend more per capita than do authorities with land value systems.⁹

By contrast, equation (4) adds little to the explanatory power of equation (2) with the CV/AV term not significantly different from zero at any conventional level of significance. The implication of these equations, is that local authorities that wish or need to spend at high per capita levels favour capital value rating, but the choice of rating system does not alter the relationship between rates revenue and expenditures.

We have already noted that authorities with higher mean incomes also tend to have higher per capita local authority expenditures. Notably, when the CV/AV dummy variable appears in equation (3), the coefficient on mean income is no longer significantly different from zero. The reason for this is a high correlation between authorities which have high mean incomes and those that choose to adopt CV or AV rating systems. This feature is exhibited in equation (5) in which the CV/AV dummy "explains" 62% of the variation in mean income across authorities (again, no causation is inferred):

$$\log MI = 0.078 CV/AV + 10.048 \quad (5)$$

(0.015)*** (0.013)***

n = 219 $\bar{R}^2 = 0.621$

The estimated coefficient on CV/AV in equation (5) implies that local authorities having CV or AV rating systems on average have mean incomes that are 8.1% above those in local authorities which utilise a land value rating system.

By contrast there is no significant relationship between population density and choice of rating system as demonstrated in equation (6):

$$\log MI = 0.207 CV/AV - 1.928 \quad (6)$$

(0.292) (0.252)***

n = 219 $\bar{R}^2 = -0.012$

⁹ We are not attributing causality here.

We do not attempt here to explain why the link between higher mean incomes (and higher per capita expenditures) and CV/AV rating may arise. However, we note that this finding using data across all local authorities is consistent with one distinguishing feature of the local authorities that have switched rating systems since the mid-1980s. Since 1989, nine local authorities have switched from land to capital value rating (out of 57 that initially used land values)¹⁰; no authorities have switched to land value rating. Those that have switched are a mixture of rural and urban authorities with 2001 population density (population per square kilometre) varying from a low of 2.8 to a high of 253.4. The population density characteristics of these authorities do not distinguish them from the local authorities which retained land value rating throughout the period.

However, the switching authorities had a mean income per head in 1991 of \$18,139 (with a standard deviation of \$1,725) compared with a mean income of \$16,861 (with standard deviation of \$1,741) for the authorities that did not switch.¹¹ A test of the difference between these two means indicates that they are significantly different from one another at the 5% significance level.¹²

The convergence of these sets of results indicates that wealthier local authorities tend to adopt a capital value rating system in preference to a land value rating system. We cannot say what this preference is driven by. We are cautious not to attribute causality since third factors may be leading to the observed association. Future work will analyse these matters more closely. The fact that a number of local authorities have made the switch from land value to capital value rating should assist in deriving the source(s) of this observed association between higher than average mean incomes and adoption of a capital value rating system.

¹⁰ The nine that have switched (with the date of switch in brackets) are: Dunedin City (1989), Tasman District (1991), Banks Peninsula District (1992), South Waikato District (1993/94), Invercargill City (1994), South Taranaki District (1994), Otorohanga District (1996), Hutt City (1997), Franklin District (1999/2000).

¹¹ The median "mean income" for the authorities which did not switch was even lower at \$16,637.

¹² Letting X be the sample mean, μ the population mean, σ the standard deviation, n the number of observations and denoting the two samples by subscripts 1 and 2 respectively, our test is based on: $X_1 - X_2 \sim N(\mu_1 - \mu_2, \sigma_1^2/n_1 + \sigma_2^2/n_2)$.

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