

**Land Taxes and Revenue Needs as
Communities Grow and Decline:
Evidence from New Zealand**

Suzi Kerr, Andrew Aitken, and Arthur Grimes

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Abstract

New Zealand is unusual in that nearly 60% of local services are funded from property taxes. These are a mixture of land taxes, capital value taxes, annual rental value taxes and uniform general charges. We explore the efficiency and equity of this system at both national and local levels. We find that the national property tax base is large relative to spending needs but that the variance in per capita tax bases across territorial local authorities is probably greater than is efficient or equitable. We find that land taxes are more progressive than capital value taxes. Our research also addresses local authorities' ability to provide services as their property tax base changes as a result of external economic shocks. We consider the occurrence of and responses to "fiscal stress" in a system of local government that is heavily dependent on property taxation. We provide some examples of the wide range of actual responses by local councils faced with similar population changes. Finally, we offer some tentative conclusions and implications both for New Zealand local public finance and for the use of property taxes, and particularly land taxes, more broadly.

About the Authors

Suzi Kerr
Corresponding Author
Motu Economic and Public Policy Research
PO Box 24390
Wellington
New Zealand
Email: suzi.kerr@motu.org.nz

Andrew Aitken
Motu Economic and Public Policy Research
Email: andrew.aitken@motu.org.nz

Arthur Grimes
Motu Economic and Public Policy Research
Email: arthur.grimes@motu.org.nz

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Introduction

In New Zealand, local government provides waste management, water, local roads, land management, parks, libraries and other local infrastructure and public goods. It does not provide education or health services. New Zealand has two levels of local government: Regional Councils, of which there are 16, and Territorial Local Authorities (TLAs), of which there are 74.

New Zealand is unusual in that in the average TLA, nearly 60% of local services are funded from property taxes. These are a mixture of land value (50 TLAs), capital value (23 TLAs), and annual rental value (one TLA) taxes, and uniform general charges. Other revenue sources are grants and subsidies from central government (10%), investment income, sales, and fees and fines. Using a uniquely comprehensive and rich dataset on New Zealand local government finances over twelve years, this paper empirically addresses two basic questions: Are property taxes a good way to fund services? To the extent that local property taxes are used, is one form of tax, land or capital value, preferred?

Our work builds on previous work by the Lincoln Institute. In particular, Chapman (1999) considers the effects on local government of limitations in property tax revenue following Proposition 13. He particularly focuses on the damage to local government fiscal autonomy and the ways communities responded to the restrictions so as to enhance their tax base and adapt their expenditures. Our research addresses local governments' ability to provide services as the property tax base changes as a result of external economic shocks. In particular we consider the occurrence of and responses to "fiscal stress" in a system of local government that is heavily dependent on property taxation. Chapman (1999) defines fiscal stress as occurring when local government revenues fall but the demand for local services does not, or when citizens increase their demand for local government services and local revenues do not or can not increase.

Paper Structure

The paper begins with a short case study that has recently grabbed public attention: Auckland Regional Council stirred up a storm of protest on the generally rather esoteric issue of property tax design when they integrated seven separate tax systems. We then step back to briefly review basic issues of local government roles and accountability to provide perspective for the analysis. As essential background, we review the revenue-raising options available to local authorities in New Zealand, drawing on earlier work by McCluskey et al (2002). Section 4 discusses the datasets used in our analysis.

We explore the efficiency of the New Zealand system at both national and local levels. We find that the national property tax base is large relative to spending needs but that the variance in per capita tax bases across TLAs is probably greater than is efficient. To move beyond an analysis of static effects, we draw on previous work (Grimes et al 2003) to study the drivers of changes in property values and hence the tax base. New Zealand regions experience dramatic changes in population and economic performance that are

largely driven by external shocks. These are reflected in significant movements in tax bases.

The high level of variation in per capita tax bases that we find in our analysis of efficiency clearly raises important equity and distributional issues. We consider both the variance in taxes and services across TLAs and the incidence of the tax within each TLA.

Having established the conditions that TLAs face and the problem of widely varying tax bases, we explore how TLAs should respond to changes in their populations and their tax base and complement this with some examples of the wide range of actual responses by local councils faced with similar population changes.

Finally, we offer some tentative conclusions and implications both for New Zealand local public finance and for the use of property taxes, and particularly land taxes, more broadly.

Auckland Regional Council

The Auckland Regional Council (ARC) primarily provides transport and environmental services (monitoring and consents). The New Zealand Local Government Act (2002) required the ARC to standardise its rating system across the seven TLAs shown in Figure 1. Prior to the rationalisation, the ARC collected its revenue through the TLAs and thus used their rating systems. Of the seven, five use land value, one uses capital value and one, Auckland City, uses annual rental value (most akin to capital value). The variation in differentials between the residential, business and rural tax bases was also considerable. For example, North Shore charged business properties nine times the level of tax it charged residential properties. These differences meant that any common system would lead to some considerable changes in levels of rates for some individuals.

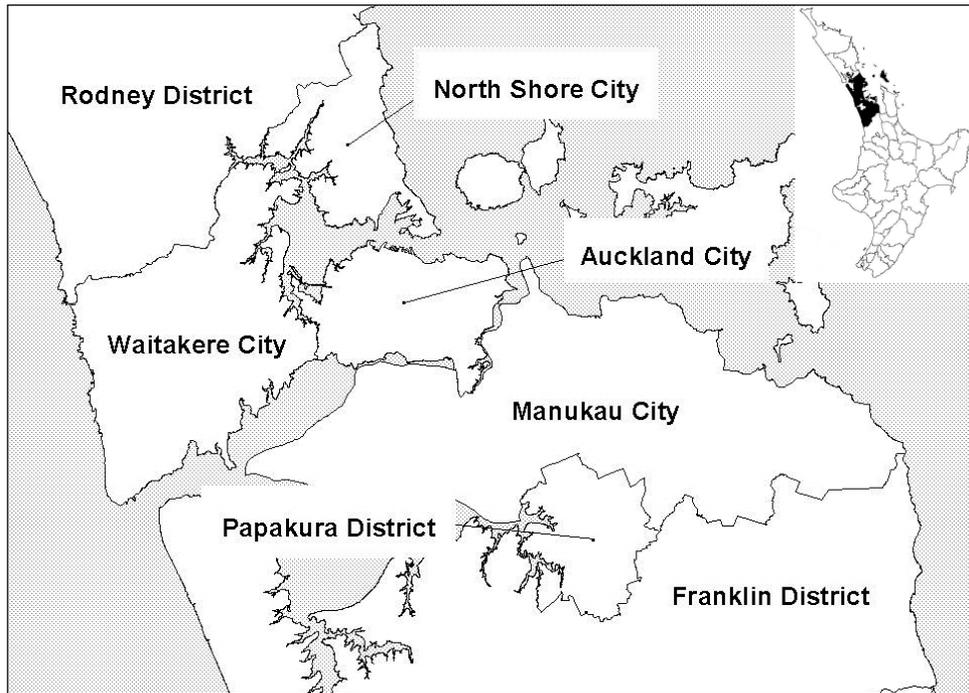
At the same time, transport costs were rising substantially in the Auckland region as a result of rapid population growth and relatively weak infrastructure. Thus the overall level of rates rose.

The ARC chose to move to a system solely based on capital value, with no differential between business and other properties but with a differential based on access to transport services to proxy for the lower level of services provided to rural areas.

Some people faced significant changes in rates, with up to 100% increases in some cases. Particularly hard hit were residential properties with low land values but high capital values (e.g. apartment buildings) in North Shore. Marches, email campaigns, a website (www.ratesrebellion.org.nz) and letters all voiced strong public disapproval. One Member of Parliament (MP), Rodney Hide, proposed a bill that would limit rate increases (though not as stringently as in many US states).

Another MP, Maurice Williamson, questioned the basic financing of local transport services through property taxes.

Figure 1: Auckland Region and Territorial Local Authorities



“...why are we still prepared to allow the value of our properties to be used to work out how much we should as individuals pay for using the roads, and how much we should as individuals be subsidising public transport?”¹

A recent survey reported that 71% of Aucklanders would support change from the new system, though it is not clear what they would prefer.² One councillor, Michael Barnett, said, "The whole reaction to the rates is we want a better transport system but we don't want to pay for it." He said the Auckland Chamber of Commerce is looking at alternative ways to fund transport services, including getting money from central government, fuel taxes and loans.³

In the same survey, 46% said they would have preferred a system based on land value while only 39% supported a system based on capital value. It is not clear how informed these preferences are, though, given the level of media exposure, ordinary people are likely to have some understanding of the issues involved.

Local Government Roles and Accountability

Why Do We Have Local Government?

The primary role for local government is to provide local public goods and address local externalities. These are services that cannot easily be provided by the private sector. As Oates (1999) explains, local environments, needs and preferences are heterogeneous and local public good provision and resource regulation should reflect this. New Zealand shows high levels of heterogeneity in income and other characteristics (Kerr and Timmins, 2000).

In contrast, central government is frequently constrained to apply consistent and uniform policies across diverse regions. As Kerr, Claridge and Milicich (1998) discuss, this uniformity may be unavoidable because when local people are not paying for services, any variance in the level of services provided can seem like favouritism, and the perception could be accurate if some regions are more politically powerful than others.

Optimal levels of local services can vary because of geophysical characteristics (e.g. water scarcity or availability of areas suitable for landfills) and characteristics and preferences of local people, both about the services to be provided and the cost of paying for them. To the extent that preferences are subjective, only local people can know what benefits or costs they derive from particular choices of service provision. Thus they would need to be actively involved in the decision-making process to represent these preferences. On the other hand, when complex, relatively objective information is involved in local decision-making, and especially where similar issues affect many different local areas, it may be efficient to have some centrally supplied capability to provide expert advice. This could raise the quality of information available and avoid duplication of analysis.

If decisions about local service provision are made locally, ideally local people should also expect to pay for those services so that they take full account of the costs and benefits of their decisions. An exception to this is where the benefits of more equal distribution of services across local areas are considered to offset the loss of a clear link between cost bearing and benefits.

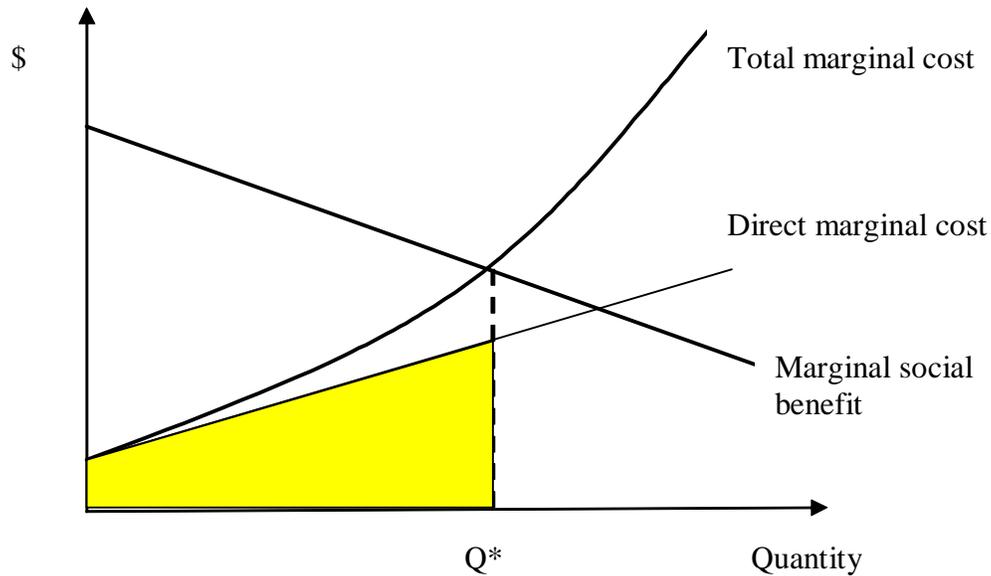
Having local governments that make decisions with input from local people fund most of their services locally but get advice from central government could lead to high-quality, balanced decisions on appropriate levels of services.

What Level of Services Should Local Government Provide?

Simply stated, the marginal value of services should equal the marginal cost of services, and the total cost should not exceed the total value. Where the good is a public good, the marginal value should be the sum of all the individual marginal values. The cost should include the cost of raising the revenue through taxation (discussed more in Section 0). This simple story is illustrated in Figure 2 where the optimal quantity of services is

shown as Q^* . Across local authorities, the costs of service provision vary because of differences in geography and population density. TLAs also have varying levels of existing infrastructure.

Figure 2: Optimal Level of Public Services



The value of services also varies. Partly this may relate to local preferences. Older people and those with children might want safe streets and access to libraries. Some groups may not be so concerned with low quality waste disposal (solid or liquid). Some people will want good urban amenities while others value open space and suburban parks. Some people believe in an active government that provides a wide range of services.

Others believe in government that is limited to essential basic services. Preferences are likely to affect the type of service provision as well as the “level” of provision. This variance justifies local decision-making and also means that local services optimally vary even if costs are identical.

Optimal service provision will also vary with local income levels. Richer people have different preferences, so they are likely to demand more of some services (parks, libraries, water quality) and less of others (council housing, public transport). We can think of this as a substitution effect. However, richer people are also simply able to afford more services (an income effect). With local funding, the level of services chosen will depend arbitrarily on the boundaries of the jurisdiction and, critically, how many wealthy people are included in that jurisdiction.

What Makes Local Government Accountable?

Local government effectiveness depends, in part, on how closely it reflects the interests of local people. People’s preferences can be represented in two ways. First, they can

express themselves directly through local elections and political activity. As Fischel (2001) argues, homeowners have a particularly strong incentive to actively work for effective local government because the success of local communities is directly reflected in property values. This local political response was highly visible in the case of the Auckland Regional Council, but in general, turnout for New Zealand local government elections is relatively low. (For discussion of the effectiveness of local democracy in New Zealand see the whole issue of *Political Science*, 50(2), January 1999, devoted to "Local Government in New Zealand".)

Second, they can respond through migration. People can move from areas where services are poor and/or rates are high. Tiebout (1956) models local governments as a series of "clubs" competing for members. Local government cannot choose the size of their "club" (TLA boundaries are defined by law and migration is not controlled). They can, however, offer a set of services and rates to attract constituents. Competition leads to both efficient choices of packages and efficient provision of services.

New Zealand does have high levels of internal migration relative to many countries and some residential choices may be driven by local government, especially where several TLAs are within the same city (e.g. Auckland or Wellington) and hence within commuting range.

This model, while providing strong insights, is limited, however, by the small range of choices in a small country (only four million people and one large city) and by labour market pressures that drive migration independently of local government. Krugman (1991) discusses the pressures for agglomeration that are driving increased concentration of population in New Zealand and elsewhere. Kerr et al (2001) explore the effects of agglomeration pressures on net migration patterns in New Zealand. They find that people are moving toward denser areas with higher levels of education. Choy et al (2002) use a VAR approach to model the effects of labour market pressures on migration and find that migration is the main form of labour market adjustment in New Zealand. Conversely, Maré and Timmins (2003) find that labour market factors are important drivers of overall migration. To the extent that local government can affect the local labour market, these pressures can be related to their performance, but this link is probably tenuous given the limited local government roles. Thus migration may provide some pressures for local accountability but most migration probably relates to factors outside of local government control.

How Should We Pay For It?

Three main funding approaches are available: regulation, user charges and taxation.⁴ McCluskey et al (2002) discuss the legal funding options and the process for choosing funding for each service in more detail.

Regulation

This is a non-priced way to pay for avoiding externalities. By requiring or prohibiting certain actions, local conditions (e.g. environmental) are improved. The cost is borne by

the people whose activities are restricted or otherwise affected by regulation. The cost may be a lost opportunity rather than direct expenditure.

Where regulation is applied efficiently it has advantages. It allows those who are regulated to respond as efficiently as they can to meet requirements. It has indirect effects that discourage certain types of development when the social costs exceed the private benefits. On the other hand, the non-transparency of regulatory costs and the complexity of choosing appropriate levels may tend to induce inefficient and possibly inequitable regulation.

In some situations, regulation might seem fair because it makes the “polluter” pay the costs of their actions. In others, people’s actions may be restricted in order to provide a positive public good such as open space or protection of significant natural areas.⁵ It is not clear that individual landowners who just happen to own the “wrong” pieces of land should bear the costs of providing these social benefits.

User Charges

Many of the services provided by local councils could, in principle, be charged for directly and provided as private goods. This was the point made by Maurice Williamson in the Auckland Regional Council case. Local governments can meter water and sewage; they could charge for use of local roads; local governments can charge for or even privatise solid waste collection; library users could pay for membership. If charging is applied, those who benefit from the service pay for it. This has the advantage that users will more closely monitor the cost and quality. It may also control total usage efficiently.

For example, road user charges can reduce congestion; water charges can allocate scarce summer water supplies more efficiently than watering bans. Road user charges have frequently been considered in the Auckland region and may be a good solution to traffic congestion.

However, sometimes charging is infeasible, inefficient or inequitable. For example, the fixed costs of water metering or road charging, the social costs of charging children and old people for library membership, and the complex side effects of local road charging may make charging unattractive.

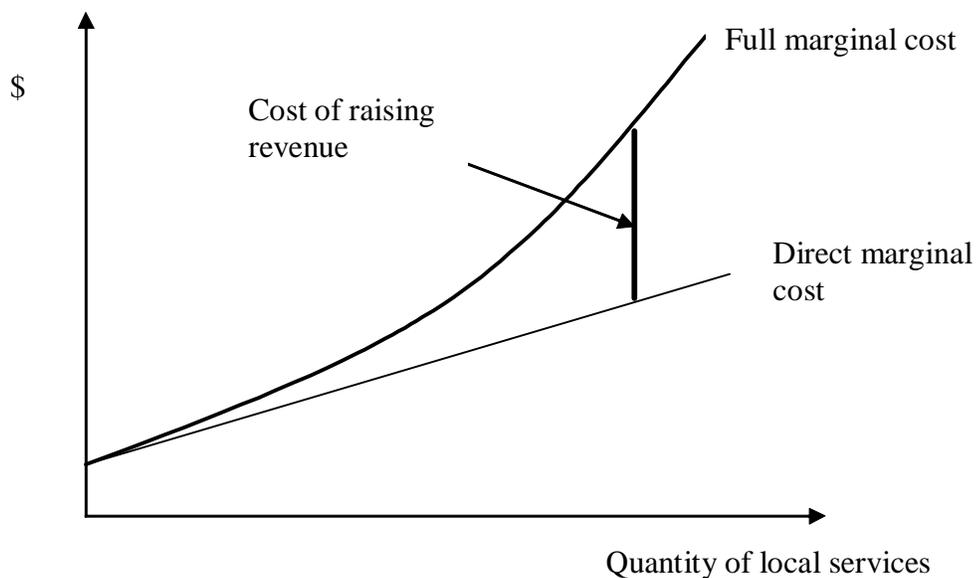
Taxation

Taxation is the remaining form of funding. Ballard et al (1985) estimate that in the United States, each additional \$1.00 of government revenue raised through distortionary taxation costs society between \$1.17 and \$1.56.⁶ Their mean estimate is \$1.30. Jorgenson and Yun (1990) found a marginal efficiency cost of 38% of tax revenue and an average efficiency cost of 18% of tax revenue after the US tax reforms in 1986. One study in New Zealand (Diewert and Lawrence 1994, 1996) suggested that, in New Zealand, marginal efficiency costs were around 18% for labour taxes and 14% for value added taxes in 1991. These calculations are done at current tax levels. The level of distortion generally rises with the square of the tax rate, so if tax rates double, the distortion quadruples.

We have found no studies on the marginal cost of revenue raised by local councils. Theoretically we know that land taxes are more efficient than income taxes (see more discussion in Section 0 below) so the local distortion may be lower than the national average. In addition, to the extent that local taxes draw on a different tax base, the marginal distortion could be lower.

Figure 3 shows how the total cost of providing services combines the direct cost and the cost of raising the revenue. The more services are provided, the higher the tax rate must be, and hence the greater the marginal tax distortion and marginal cost.

Figure 3: Marginal Cost of Revenue Raising



When using tax funding, the two basic questions are whether the tax is national or local and what tax base is used: property (and what type), income, sales, value added or capital.

The advantages of a national tax base are that it is broad and therefore more stable and that it allows redistribution. The advantage of local taxes is that they reinforce local accountability. We do not explore the tradeoffs between different tax bases since New Zealand local government does not have the authority to tax anything but property. Our interest in other tax bases is in the interaction between property taxes and other pre-existing taxes. This is pursued further below.

While local authorities have no choice about what they tax, they do have choices about how to tax property. They can use land value, capital value or annual rental value as their tax base. They can also differentiate tax rates across types of property, for example residential, commercial/industrial (business) and rural. These choices of tax base have

efficiency as well as equity implications. Different groups receive different levels of service, which might justify different levels of tax. Different groups are also more responsive to taxes, so some groups' activities are more highly distorted. Income and wealth also vary across groups. Both equity and efficiency implications depend largely on who actually pays the tax. This is not always obvious.

Who Really Pays Property Taxes?

Direct Incidence

Homeowners, commercial property owners and farm owners pay property taxes directly. They can often, however, pass those taxes onto others, so they may not ultimately bear the costs.

Indirect Incidence

Ultimately all taxes are borne by labour or capital (natural or produced). Capital originates through labour or through capital gain as a natural resource becomes scarce. It can be passed on through inherited wealth. The tax on labour is in this case most easily thought of as a tax on consumption that makes working to earn income less attractive. A property tax is partly a tax on the consumption of services from property.

Those with more inelastic behaviour tend to bear taxes. For example, if renters have a relatively fixed demand for apartments while the supply of apartments is flexible (because they can be turned into offices), any change in property tax on residential properties will tend to be passed on in rent. If the tax is on all land, however, the landowner will bear the tax because their supply of land is perfectly inelastic. Also, those who own a large amount of property will pay more tax. For example, farms and retail businesses, for which a large part of cost arises from property, are likely to be more affected by tax. Those who own valuable residential dwellings will tend to bear more of the cost of taxes. A property tax is partly a tax on services from owner-occupied housing, which are currently untaxed in New Zealand.

Homeowners who have put a large amount of saving into property will also bear more property tax. By taxing property, local government is implicitly taxing one form of saving. To compensate for this and maintain their future income, savers would need to save more in other ways. Thus a property tax could induce an increase in investment in other forms of capital.⁷

Finally, workers whose skills are tied to the use of property might suffer a fall in wages as a result of property taxes. The return on property will tend to fall with property taxes, so demand for these workers might decline.

Finally, a property tax is partly a lump sum tax on land and existing improvements. When capital gains occur, they lead to increased taxes. Passively earned capital gains are currently untaxed in New Zealand.

Efficiency

Many people argue that a land tax is a highly efficient tax because it cannot be shifted. As Feldstein (1977) showed, this is not strictly true, but it is still probably more efficient than most taxes. In New Zealand, a very open economy, interest rates are heavily determined by macroeconomic conditions (e.g. expectations about the exchange rate) and international developments. Land taxes are unlikely to heavily influence the return on capital, which is the principal mechanism behind Feldstein's argument. The efficiency of land taxes does depend heavily on an assumption that all land is taxed, and preferably at similar rates. Tax differentials between uses do allow some distortions.

To the extent that a land tax is a capital gains tax or a tax on un-produced goods, it is a low cost revenue source. A capital value tax also taxes improvements. These are more elastic and hence less efficient to tax. A tax on improvements will discourage new investment in them.

Taxes do not operate in isolation. Because income and consumption are taxed already, a property tax that reduces workers' salaries, raises rents or reduces the return to saving, adds on top of existing taxes unless those existing taxes are cut at the same time as property taxes are imposed. This makes the marginal distortion higher than it would be in the absence of offsetting cuts to other taxes. If other taxes are cut, the distortionary impact will depend on the incidence of the various taxes upon certain groups. If land and improvements in residential properties are highly complementary to leisure, property taxes could implicitly be taxing leisure and encouraging work. In New Zealand, where people use their homes as a primary locus for entertaining and gardening is a major recreational activity, this could have some force.

To a certain extent the property tax compensates for "gaps" in the overall tax system. Both passively earned capital gains and services from owner-occupied housing are currently untaxed in New Zealand. Thus these tend to be relatively non-distortionary taxes.

A land tax and tax on existing improvements are relatively unavoidable if imposed at a national level, but where these are used locally they could induce migration effects. If taxes reflect the true cost of services this can be efficient, but if local authorities attempt to redistribute the cost of service provision, it would not be. Local authorities could compete for businesses by lowering taxes on them. This effect is discussed in the literature as a key issue in "fiscal federalism"⁸ There is no obvious evidence of this in New Zealand. A greater risk in New Zealand might be that during periods of rapid adjustment, the cost of services in declining regions might rise above its long-run level, and exacerbate the population decline by inducing more out-migration.

Equity of a Tax on Lump Sum Value

A lump sum tax has efficiency advantages. Is it equitable to tax land wealth? The value of land is the present value of local amenities and the income/lifestyle generating potential of a place. These are socially created values. The land would have little or no value without the society around it.

Henry George, advocating a single tax on land, stated the following in his treatise *Progress and poverty* (first published in 1879):

“The tax on land values is, therefore, the most just and equal of all taxes. It falls only upon those who receive from society a peculiar and valuable benefit, and upon them in proportion to the benefit they receive. It is the taking by the community, for the use of the community, of that value which is the creation of the community. (Book VIII, Chapter 3).”

On the other hand, the capitalised value of these benefits was gained as soon as the potential for the value was anticipated. It was historical owners of land who received these benefits through historical capital gain. Current owners may have paid for their land out of savings from labour income. An increase in land taxes takes away their hard-earned wealth. A large rise would be extremely unpopular and arguably very unfair. In New Zealand we have few large landowners or landlords. Property also changes hands very rapidly. It would be interesting to explore the extent to which property wealth is held by people with a lower income and what proportion of the wealth of people with a lower income is held via property relative to that of more affluent groups.

If we were to start afresh, a land tax that extracts most of the rent from land might be equitable and efficient, but imposing this in an existing property market would create significant and probably inequitable wealth shifts. Imposing higher rates of land tax on future capital gains, however, could be both efficient and equitable. We now move on from theoretical arguments to evidence about actual property taxes in New Zealand.

Data

The data used in this paper comes from three sources: property valuation data from Quotable Value New Zealand (QVNZ); a dataset of rates revenues, total revenues and total expenditures from TLAs; and census data for three years: 1991, 1996 and 2001.

Property Valuation Data

QVNZ is a former central government entity with a mandate, up until 1998, to assess values of all New Zealand properties on a consistent basis. This provides an assurance of data quality. Since 1998, several local authorities have carried out their own valuations. Although QVNZ still collects a complete set, unfortunately we needed to exclude some

of this independently collected data because it did not appear to be consistent. Valuations are done every three years, although the cycle differs across local authorities.

The QVNZ dataset contains average land and capital valuations as well as the number of properties and their average area for 73 local authorities and 1,743 area units over the period 1990-2002.⁹ Area units are equivalent to suburbs and have an average population of approximately 2,000. Data are available for seven different residential categories. We have aggregated these to form one residential category. Similarly, we aggregated nine rural categories to form a single agricultural category and combined commercial and industrial properties. To create the rates base variable, we linearly interpolated the number of properties between the three yearly observations and backfilled the average capital/land value with the most recent value.

Local Authority Finances

Annual data on local authority finances for the period 1991–2001 include information on rates, user charges and other revenue sources. Also included are data on expenditure by five categories: parks and community facilities, roading, sewerage, refuse and storm water, water treatment and supply, and governance and administration. These data were collected from the annual reports of territorial local authorities.

Census

Census of Population and Dwellings data used in this research include the 1991, 1996 and 2001 population and median income within local authorities and area units.

Pooling this information for 73 TLAs over three census years gives a potential 219 observations. In practice, some data are missing, leaving 208 observations. Pooling these data for 1,743 Area Units gives a potential 5,229 observations. Excluding missing data leaves 2,406 observations. Where necessary the data are deflated by the Consumers Price Index. Unless stated otherwise, all figures quoted are real.

Is It Efficient?

The total value of property in New Zealand in 2002 was \$336 billion. This represents a broad tax base relative to the cost of services. If we assume a real rate of return on property of 5%, this implies an annual flow of services/income of around \$17 billion. New Zealand's GDP in 2002 was \$125 billion. Thus the income flow from the property tax base is around 14% of GDP. Land makes up 46% of total property value.

In contrast, total government spending in 2002 was approximately \$33 billion, while local authority expenditure was about \$976 million. Thus local government spending is around 3% of total government spending. Local authority expenditure was 5.7% of the implied services from property, so even if all local authority expenditure were financed from property taxes the implied tax rate would be very low—less than half the rate of GST (value added tax) and approximately one-seventh of the top personal tax rate. Another way of expressing this is to note that property forms a broad tax base.

Figure 4: National Per Capita Tax Base

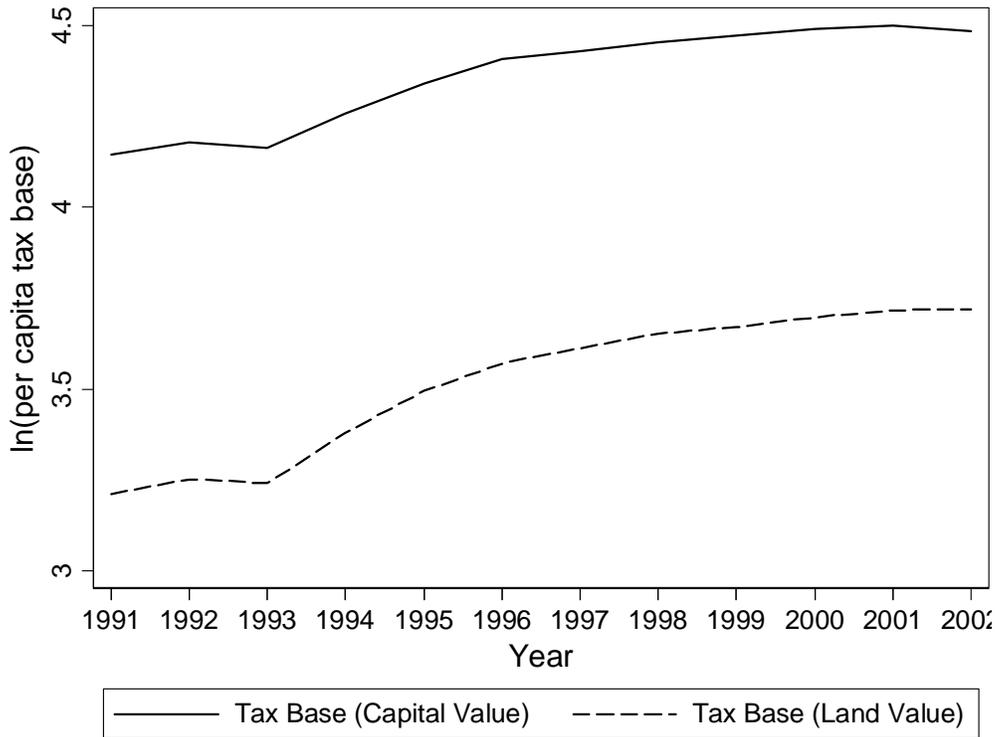
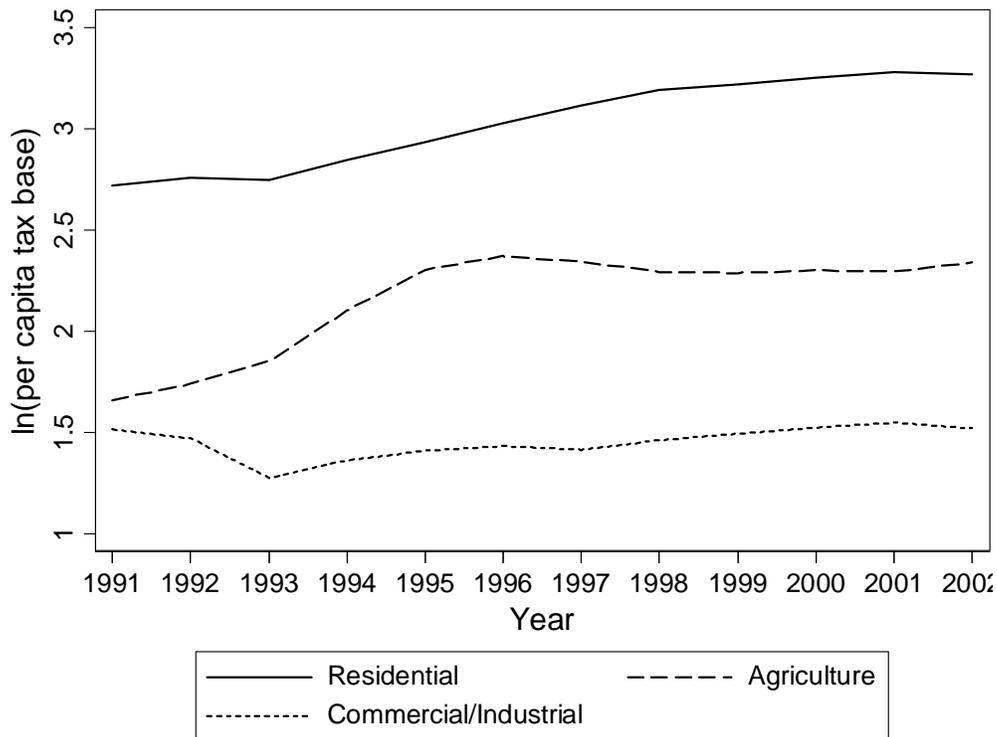


Figure 4 shows the growth in the land value and capital value of the national per capita property tax base. The average annual growth in per capita total capital value was 3.2% between 1991 and 2002. The per capita land value has grown at a higher rate of 4.8%. This suggests that, if the valuations were done correctly, the increases in value were largely a result of capital gain rather than investment in improvements. However measured, the property tax base is growing faster than per capita GDP, which grew at about 1.8% over this period.

Figure 5 breaks the land tax base down into the agricultural, residential and commercial/industrial sectors. The residential sector has the most value, and its value has steadily risen over the period. The agricultural sector has recovered after a large slump in the mid- to late eighties, when agricultural subsidies were removed. The value of the commercial/industrial sector has changed very little over the period other than a small dip during the recession in the early nineties.

Variation in the rates base across the country is significant. In 2001 the average per capita rates base was \$86,407 (capital value), ranging from \$42,158 in Kawerau to \$218,573 in Queenstown-Lakes District. The coefficient of variation (standard deviation divided by mean value) for the capital value rates base is 0.35; the coefficient of variation of the land value rates base is even higher, at 0.50.

Figure 5: Residential, Agricultural and Commercial Tax Bases



Variation in the rates base is reflected in significant variation in per capita rates levied across local authorities. The average rate levied in 2001 was \$526, ranging from \$283 in Papakura District to \$977 in Queenstown-Lakes District. The coefficient of variation over the period is 0.24. This is lower than the variance in the rates base, particularly when we consider that most TLAs still use land taxes. This suggests that the “rate” of tax is higher in areas with low tax bases.

Average revenue¹⁰ per capita in 2001 was \$1,082, ranging from \$391 in Papakura District to \$2,952 in Waitomo District. The coefficient of variation for total revenue is 0.39. Average expenditure per capita is also highly variable, averaging \$983 (2001), and ranging from \$441 (Papakura District) to \$2,909 (Waitomo District).¹¹ The coefficient of variation is 0.37. Revenue and expenditure are very highly correlated, with a correlation coefficient of 0.90.

The rates base per capita and expenditure per capita are also positively correlated, with a correlation coefficient of 0.33. This high correlation implies that differences in district wealth are passed on as differences in expenditure on local services (or, less probably, that differences in local authority expenditure have a major impact on property values). What drives long-term differences between districts? How do tax bases change over time?

What Drives Changes in the Tax Base?

We decompose variation in the tax base into changes in the value per property and changes in the number of properties over the period 1990–2002. We find that on average 59% of the variation in the capital value tax base across time comes from a change in value per property, with the remainder coming from a change in the number of properties. Decomposing the residential tax base in this manner we found that 55% of the variation in the capital value tax base came from a change in value per unit and 45% from a change in the number of properties.

Land value makes up only 46% of property value on average, but changes in the value of land are responsible for a much higher percentage of change in property value: 58%, compared to 42% change from the building value. This suggests that much of the change in property values derives from capital gains and losses.

What Drives Changes in Value?

Real house sales price growth between 1981 and 2002 varied significantly across areas, at both the regional and local authority level. At the regional council level, real sales price growth over the 22 years ranges from a decline of 27% in Southland to a rise of 111% in the Auckland region. At the local authority level the variation is even greater, with a 50% fall in Kawerau and an increase of 152% in Auckland City. At the local authority level, 15 areas had negative real sales growth, while prices more than doubled in six. The 15 negative cases are predominantly rural, while the cases with a doubling in real prices are in or near major cities or tourist destinations.

Grimes et al (2003) suggest that the main drivers of long-run house prices are regional economic activity, the cost of capital (including expected capital gains) and the housing stock. Real construction costs are consistent and stable across space. Regional economic activity is the most important determinant of house prices. The correlation coefficient between a percentage change in regional house prices and a percentage change in regional economic activity is 0.72 for the period 1981–2002. The correlation coefficient rises to 0.80 for the second half of the sample (1992–2002).

House price changes depend on factors largely outside the control of local authorities, such as international prices, developments in neighbouring local authorities, and long-term trends toward agglomeration. Figure 6 illustrates real house prices in two local authorities in the central North Island—Waikato and South Waikato. Despite their geographical proximity, their experiences have been radically different, with Waikato experiencing a 68% increase in real house prices between 1981 and 2002, while South Waikato has seen a 42% decline.

Prices in Waikato have been driven by strong positive export prices for dairy products, in contrast to South Waikato, which is heavily dependent on forestry and sheep and beef, which have been in relative decline. Waikato may also benefit from its proximity to the cities of Hamilton and Auckland. Is this equitable?

It is possible for property prices in similar areas to behave differently because of their neighbours. House prices in two mainly rural North Island regional councils—Northland and Manawatu—have diverged significantly since 1993. If the growth in prices in Northland is a result of holiday houses of Auckland residents, does it imply Northland’s local authority is doing well (an increase in the tax base but not service demand)? Is this fair or efficient?

Places affected by similar shocks can fare similarly. Hawkes Bay (North Island) and Canterbury (South Island) are both arable/sheep areas whose co-movement of real house prices has been driven by external forces. Should these external shocks be transmitted into local finances?

Figure 6: Real House Prices (Waikato and South Waikato)



Equity: Are Property Taxes a Fair Way to Raise Revenue?

Equity is not a concept with one definition. Vertical equity (i.e. between rich and poor), equality of opportunity relative to equality of outcome, horizontal equity (between similar people), equity based on access to services, and consistency relative to historical distribution of costs (winners and losers)—all are valid concerns. Winners and losers are politically salient because changes in rating policies will be capitalised into the value of

properties. This means that current property owners will bear a large capital loss if their rates rise. The capitalisation magnifies the effect of changes in annual rates.

Here we focus on horizontal and vertical equity. We consider equity across local authorities and the variance in rates and service provision driven by local funding. We also consider vertical equity across individuals and how the burden of tax varies depending on whether a land or capital value tax is used.

Across TLAs

We showed above that the per capita rates base varies tremendously across local authorities. This potentially raises concerns about equity across local authorities. In this section we investigate the relationship between the average capital value in the rates base and median income across local authorities. We regress the natural log of the average capital value of residential properties of each authority in each year on the natural log of its median income (so that the estimated coefficient can be interpreted as an elasticity). The results are shown in Table 1. Census years only are used, because these are the only years where we have independent data on median incomes. Two-year dummies are included to allow for the general trend in capital values across years.

Table 1: Capital Value Versus Income

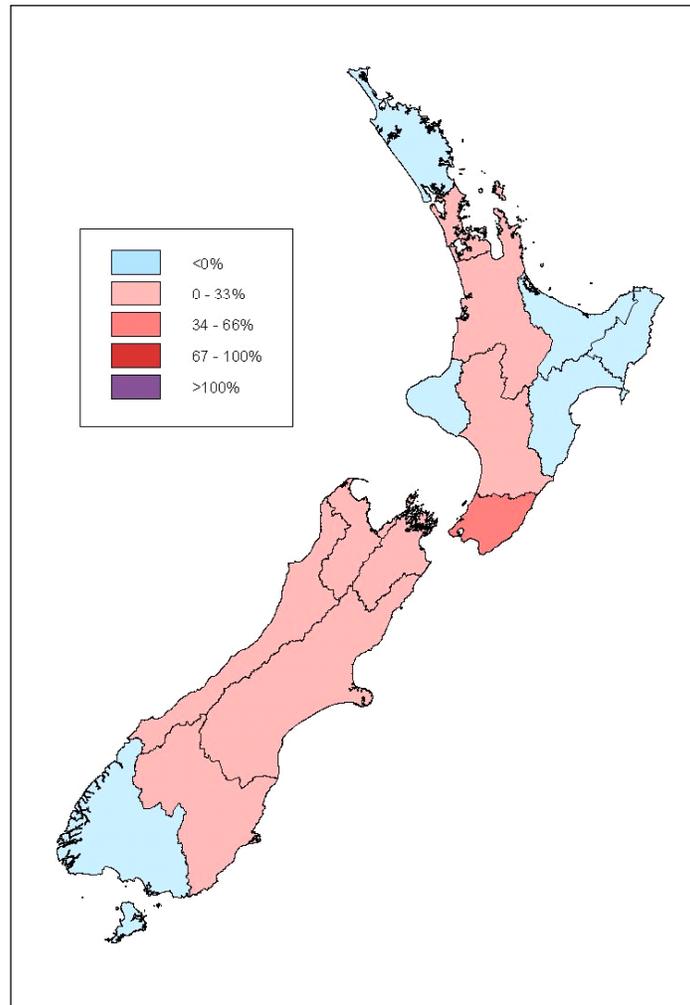
Dependent variable	Log (Capital value)
Variable	Coefficient (t-stat)
Log (Median Income)	1.90*** (10.93)
Year = 1991	-0.052 (0.92)
Year = 1996	0.072 (1.29)
Constant	-0.61 (1.25)
Observations	208
Adjusted R-squared	0.38
F	43***

* significant at 10%; ** significant at 5%; *** significant at 1%
The omitted year is 2001.

The results in Table 1 suggest that local authorities with residents on lower incomes have a much weaker tax base. A 1% rise in the median income of a TLA is associated with a 1.9% rise in average capital value.

Figure 7 shows the change in real house prices between 1981 and 1991, with falls ranging from 5% to 26% in Northland, Bay of Plenty, Gisborne, Hawke's Bay, Taranaki and Southland. Many of the most deprived rural areas in New Zealand are found in Northland and Gisborne.¹² During the 90s, we found that areas with initially low house prices had significantly slower house price growth (Grimes et al 2003). Thus local authorities with poor tax bases were actually getting poorer, in relative terms, over the period.

Figure 7: Real House Price Changes 1981–1991



Taxing Based on Land Value Versus Capital Value

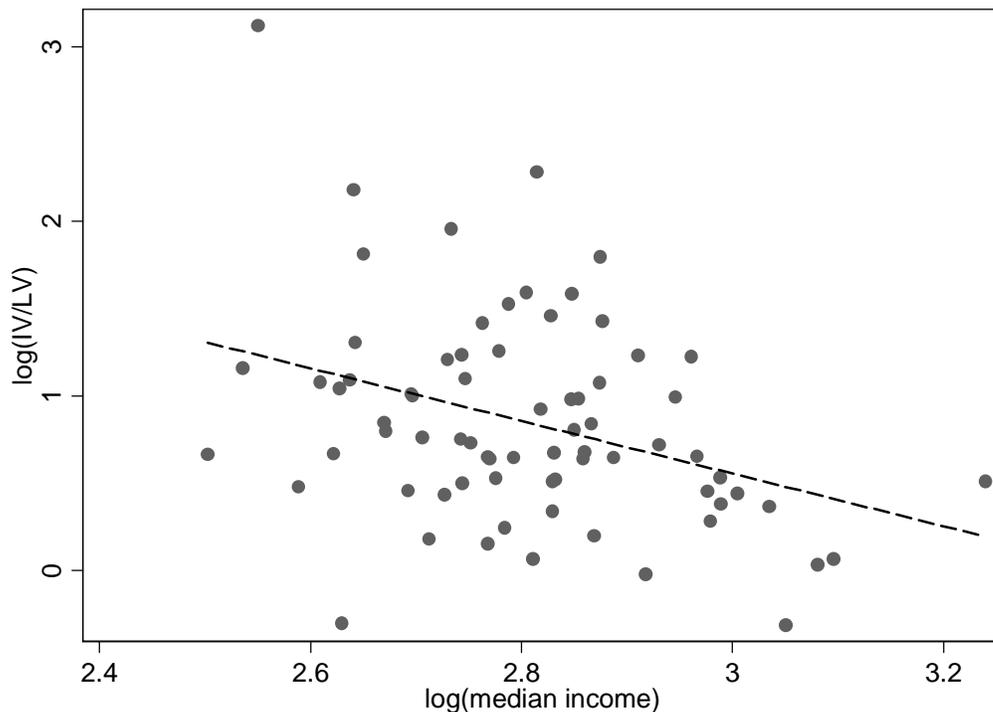
Comparisons across TLAs suggest that local financing may be (spatially) inequitable. Here we consider comparisons across taxation instruments: land taxes versus capital value taxes.

Some local authorities have switched from land value to capital value rating systems.¹³ The most common reason councils gave for this was that people with more valuable properties have a higher ability to pay. Consider a case where two pieces of land have the same land value but one has an apartment block on it while the other is vacant. Efficiency might suggest taxing both pieces of land identically to encourage efficient land use, but equity seems to suggest taxing the land with the apartment block more heavily—its owner has a larger asset. In this case, however, our simple intuition may mislead us about the more general pattern.

We do not know what other property the landowner owns or how rich he is. To add complexity, the tax is not necessarily borne by the current landowner—it was capitalised into the value of the property when first introduced. To a certain extent, the tenants in the apartment block pay the rates through their rent, so they are the relevant group to consider; they may or may not be rich. Without extremely detailed data, we cannot assess the equity of the tax in terms of levels of wealth. We can, however, look more generally at the incomes of people who live in areas with high and low land and capital values.

We hypothesise that people with higher incomes live on more valuable land—location, location, location—and so we expect the building (improved) value as a proportion of the land value to be smaller in wealthier local authorities. Evidence of this negative correlation is seen in Figure 8; this shows the ratio of improved value (IV) to land value (LV) against income, along with a fitted regression line.

Figure 8: Scatter Plot of Ratio of IV/LV Versus Income



To examine this relationship statistically, we regress the ratio of the mean improved value to mean land value of each authority in each year on its median income. All variables are in natural logs. The results shown in Table 2 imply that in local authorities with higher income, the improved value is a significantly less important share of total property value.

Table 2: Ratio of Improved Value to Land Value Versus Income for Local Authorities

Dependent variable	Log (improved value /land value)
Variable	Coefficient (t-stat)
Log (median income)	-1.58*** (6.08)
Year = 1991	0.075 (0.88)
Year = 1996	0.015 (0.18)
Constant	5.29*** (7.22)
Observations	208
Adjusted R-squared	0.16
F	14***

The omitted year is 2001.

* significant at 10%; ** significant at 5%; *** significant at 1%

This relationship also holds across suburbs within local authorities. Table 3 shows the results of regressing the ratio of mean improved value to mean land value on median income across area units within local authorities.¹⁴ The ratio of improved value to land value falls significantly as income rises. In fact this result holds in every TLA and in every time period, so it is very robust.¹⁵

These results strongly suggest that a land value tax is more progressive than a capital value tax. For a fixed amount of total revenue to be raised, richer people will pay more tax in a land tax system because although their land alone is worth less than their land and house, the value of their land is greater as a share of the total land value in the TLA.

If those with larger buildings use more public services (water, roads, sewage), then the case for taxes based on capital value, or even simply on improved value, could be resurrected on the grounds that those who use services should pay for them. This is an argument for charging more for developed relative to undeveloped land.

**Table 3: Ratio of Improved Value to Land Value
Versus Income for Area Units**

Variable	Coefficient (t-stat)
Log Median Income	-0.21*** (8.35)
Year = 1991	0.38*** (14.74)
Year = 1996	0.29*** (12.50)
TLA dummies	<i>jointly significant</i>
Constant	0.46*** (4.38)
Observations	14155
Adjusted R-squared	0.40
F	126***

The omitted year is 2001.

* significant at 10%; ** significant at 5%; *** significant at 1%

Responses to Change

In Section 0 we discussed the optimal level of service provision by local authorities and how it can vary across communities. Here we focus on changes over time as communities respond to economic shocks. These changes should be driven by changes in demand and in the cost of services (see Figure 2). When a community receives a shock they will face different pressures in the short and long term.

Changes in the size of population, the demographic structure of that population and their income will have direct effects on service demands. How much demand changes as income rises depends on whether local services are luxuries, normal goods or necessities on the margin. Changes in the industrial structure in an area might also change demand. For example, the recent boom in forestry in East Cape has put severe pressure on local roads and on the port.

Population change simultaneously alters costs. Population change affects the per capita costs of public goods and shared infrastructure directly. In the short run, the total cost of

infrastructure is likely to be sticky and the local authority is caught with a now inappropriate level of capital stock. If population declines, the infrastructure is too large but the local authority must continue to maintain and operate it. If population expands, the now-too-small infrastructure will come under considerable pressure until new investment occurs. In either case, in the short run, per capita costs could rise considerably. In the long run, a smaller community will be disadvantaged by loss of economies of scale in some services but in others may benefit from lower scarcity and congestion (e.g. provision of parks).

Changes in local income and population also affect cost through the cost of raising revenue. Falling income and population lead to a falling tax base. Some evidence (Glaeser and Gyourko, 2001) suggests that the change in the residential tax base may be quite asymmetric in response to shocks, with property values falling below the cost of the buildings—implying negative land value in declining areas. It is harder to raise revenue from a smaller tax base. There are fewer people to raise from, so per capita taxes rise.

Lower values for properties reflect lower levels of economic activity in an area, so to the extent that the tax is passed on to workers, renters and so on it is more distortionary.

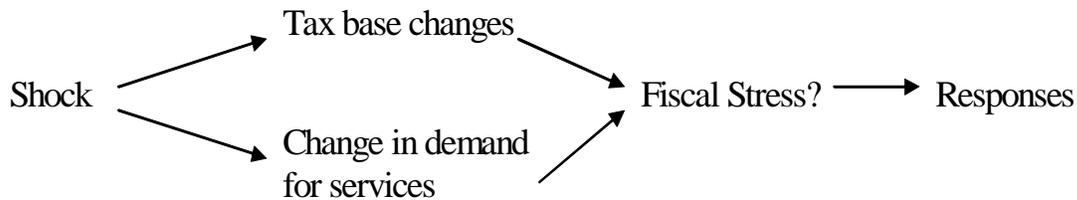
The responses of state and local governments to changes in income have been studied extensively in the local public finance literature on the “flypaper” effect (Oates, 1999 and Fisher, 1982). This literature has focused on responses to changes in intergovernmental grants. Gramlich (1977) observed asymmetric responses to increases and decreases in funding. In contrast, Gamkhar and Oates (1996) were unable to reject the hypothesis that responses were symmetric. We study responses to private income changes but where the responses are to large exogenous shocks.¹⁶ Our emphasis is on local authorities’ ability to respond in positive ways.

If a shock to either demand or costs is likely to be transitory, it is better for the local authority to absorb it if possible rather than altering levels of service provision. Adjustment costs within and outside local government are likely to be high. Even when shocks are likely to be permanent, it might still be better to smooth adjustment in services and rates if possible, particularly if short-run costs overshoot their new long-run level.

If councils have significant income-generating assets, the total impact of a shock to property values on their revenue will be reduced. They also have the ability to use these assets to maintain expenditure in the short term if revenue falls, or increase expenditure in the short run without raising revenue commensurately if demand for services grows more rapidly than revenue as population increases. Local authorities with few assets must run a close-to-balanced budget in all periods and therefore must adjust either expenditure patterns and/or rates levels quite quickly as the demand for their services rises or their rates base falls.

If the shock is permanent and response is required, the property tax rate can be increased and expenditure, and consequently services, can be reduced. Most councils will probably choose to adjust discretionary expenditure and expenditure on luxuries first. This is only

a significant adjustment mechanism if those expenditures are a reasonably high proportion of the initial budget. They may allow infrastructure to degrade in the short run and, in the long run, will provide less or of a lower quality.



National Trends in Local Public Finances

Summarising national trends will put the local cases we consider in perspective. As discussed earlier, the national tax base has been rising throughout the 1990s. Rates revenue per capita has remained pretty stable both in level and as a share of total revenue. Total expenditure is always slightly below total revenue and this surplus is expanding slightly over time. Population growth has been relatively constant at a national level, although regionally the picture is less stable.

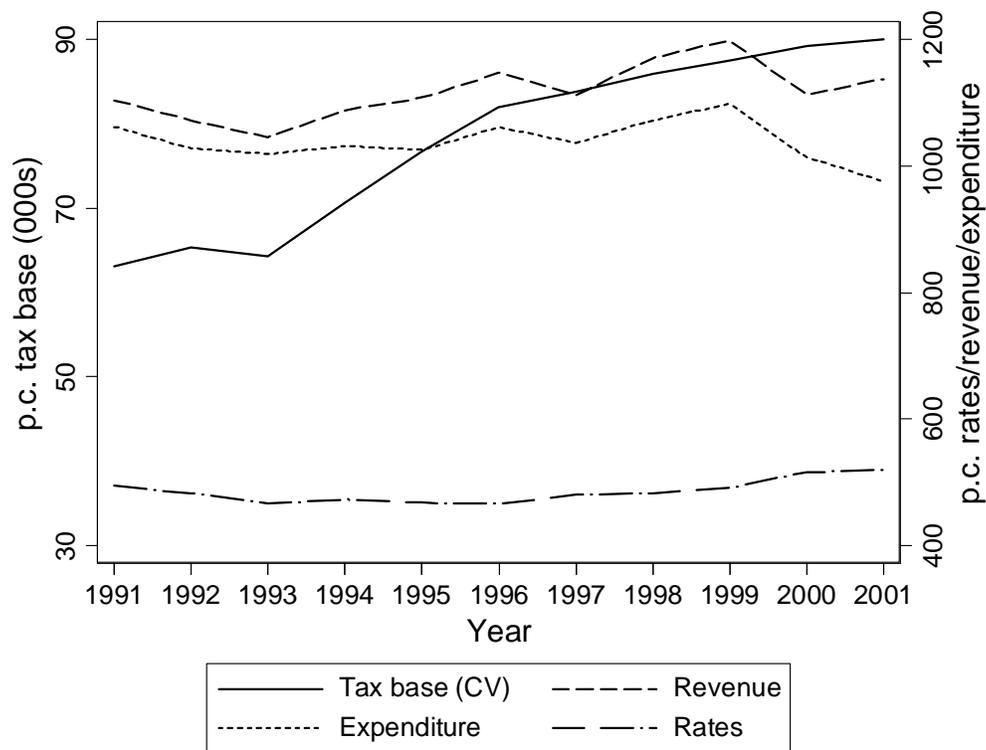
What Level of Shocks are Local Authorities Exposed To?

We have seen above that the real values of properties vary over time across New Zealand. They are subject to international shocks and trends, such as movements toward cities, that are out of local authorities' control. The other key aspect of shock that affects both local authorities' tax bases and the demand for their services is change in population.

In this section we empirically explore the effects of population changes only. These are causally related to changes in other factors, such as regional economic activity, that affect both demand for services and the rates base. Thus the analysis is exploratory and only considers correlations between population and behaviour rather than considering causal relationships.

Nationally, the population grew by 15% between 1991 and 2001. Population change is highly variable across local authorities. Over this period the population of Queenstown-Lakes grew by 71%, Rodney by 39%, and Tauranga by 36%. In contrast, the populations of Kawerau and Ruapehu declined by 16% and 15% respectively over this period. As a consequence, the demand for services and the cost of provision varies considerably. The tax base changes with population. As population rises, the total number of properties increases and average property values tend to rise. As population falls, average property values fall but the total number of properties does not fall, at least in the short run.¹⁷

Figure 9: National Per Capita Tax Base, Rates, Revenue and Expenditure



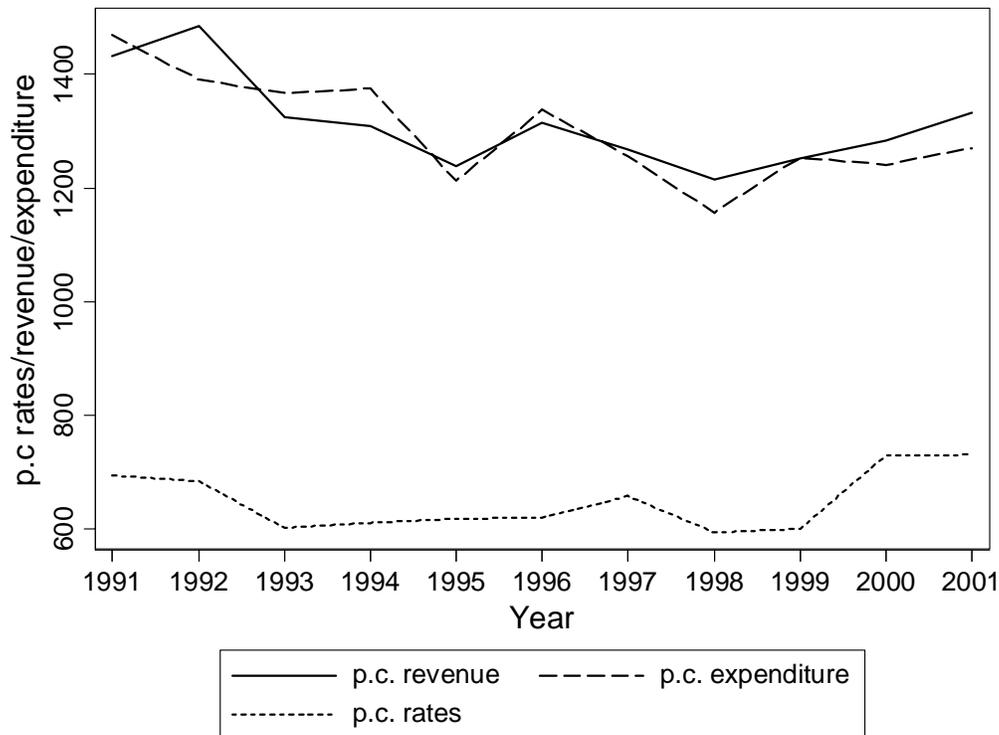
Expanding Regions

In a rapidly expanding community (e.g. a large city that expands because of increasing returns to agglomeration) the city's tax base will be rising but at the same time local government will need to make investments in infrastructure to accommodate the new migrants. If their assets or borrowing are constrained, some of the funding for this needs to come out of current revenue, and there is a short-term mismatch between demand and funding for services.

Figure 10 shows per capita rates, total revenue and total expenditure between 1991 and 2001 for Auckland City. The population grew by 20% over this period. While road spending per capita rose, the council seemed to control other spending such as on water and waste so that total expenditure per capita fell by 13%. Only 50% of Auckland City's revenue comes from rates, and total revenue and expenditure per capita was very high relative to other authorities. The high levels of initial expenditure gave them considerable budget flexibility. The non-rates revenue per capita fell as population rose. This meant that more of the services needed to be funded out of rates. Despite this, the expenditure reductions allowed them to limit rates increases to 5% over the period as a whole.

Thus Auckland seems to have adjusted relatively easily. Their budget surplus has grown. They appear to have gained economies of scale, which reduced expenditure, and to have financed new infrastructure without affecting short-term expenditure or rates. Auckland City is facing traffic congestion problems (which cannot be easily addressed through local authority expenditure) but other local services are (apparently) healthy.

Figure 10: Per Capita Rates, Revenue and Expenditure: Auckland City



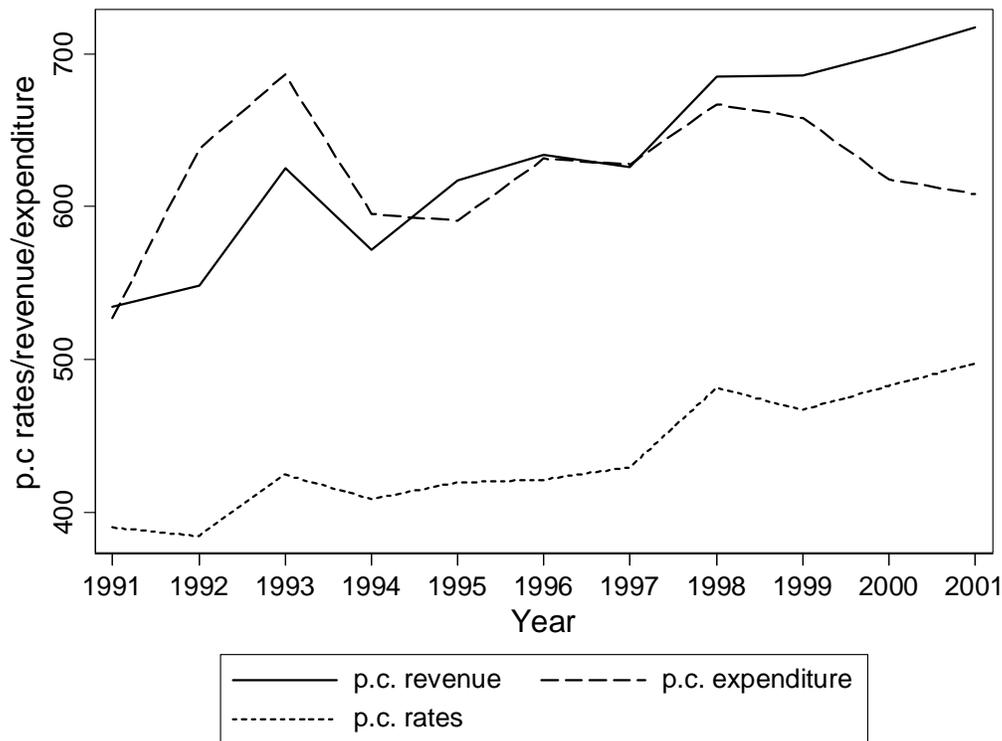
The change in rates and expenditure has been remarkably different on the Kapiti Coast, despite a similar increase in the population of 21% over the period. Figure 11 shows the pattern of rates and expenditure over the period. Expenditure per capita has increased by 15%. Early in the period Kapiti suffered a budget deficit. Perhaps in response to this, they have increased revenue by more than expenditure: 34%. Most of this has come out of increased rates. Per capita rates have increased by 28%.

Growth in this case seems to have been funded by ratepayers. Kapiti has few assets to draw upon. In 1991 more than 70% of their revenue came from rates. Their initial levels of expenditure were less than half those in Auckland, so they had little ability to cut discretionary services. The rise in expenditure per capita suggests that either they are providing higher quality services over time or they have not yet benefited from economies of scale. Among other things, they are facing problems with water supply that will require significant infrastructure investment.

Declining Regions

Exogenous shocks (increased rewards to agglomeration, technological change, external shocks such as those to key export prices or the exchange rate) may cause the tax base to decline in ways the local government cannot control. To a certain extent, demand for local services will fall if community size and income falls but out-migration may be concentrated in certain groups (the young and educated) so demand may not fall as much as the tax base.

Figure 11: Per Capita Rates, Revenue and Expenditure: Kapiti Coast



In addition some services and infrastructure need to be maintained regardless of the size of the community. Declining communities may be hit twice, with the original shock followed by a reduction in local services that exacerbates the overall effect. In this section we define declining communities according to the population change they experience.

Invercargill and Kawerau are two regions where population has declined over the period 1991–2001. Figure 12 shows the pattern of rates and expenditure in Invercargill between 1991 and 2001. In Invercargill the population fell by 11%, while per capita expenditure fell by 15%. Part of this fall in expenditure has been driven by a fall in per capita discretionary expenditure on administration and governance of 42%.¹⁸ Invercargill started

the period with levels of expenditure per capita almost twice those in Kawerau (the details of which are shown in Figure 13), so it had more flexibility to make cuts.

Another important contributing factor is that although infrastructure costs are likely to have risen per capita, it appears that some services were privatised. Revenue from user charges fell. The costs of these services no longer appear in expenditure. Revenue also fell by 15%.

In addition, Invercargill obtained less than 30% of its revenue from rates in 1991 and even by 2001 this had risen to only 45%. Thus changes in the rates base were proportionately less important than in Kawerau. Invercargill did increase its per capita rates by 33% in response to a declining population, but it minimised the adjustment by controlling expenditure. At the end of the period, rates per capita were still much lower than those in Kawerau, while expenditure, and presumably levels of services, remained higher. They maintained a balanced budget throughout the period.

Figure 12: Per Capita Rates, Revenue and Expenditure: Invercargill City

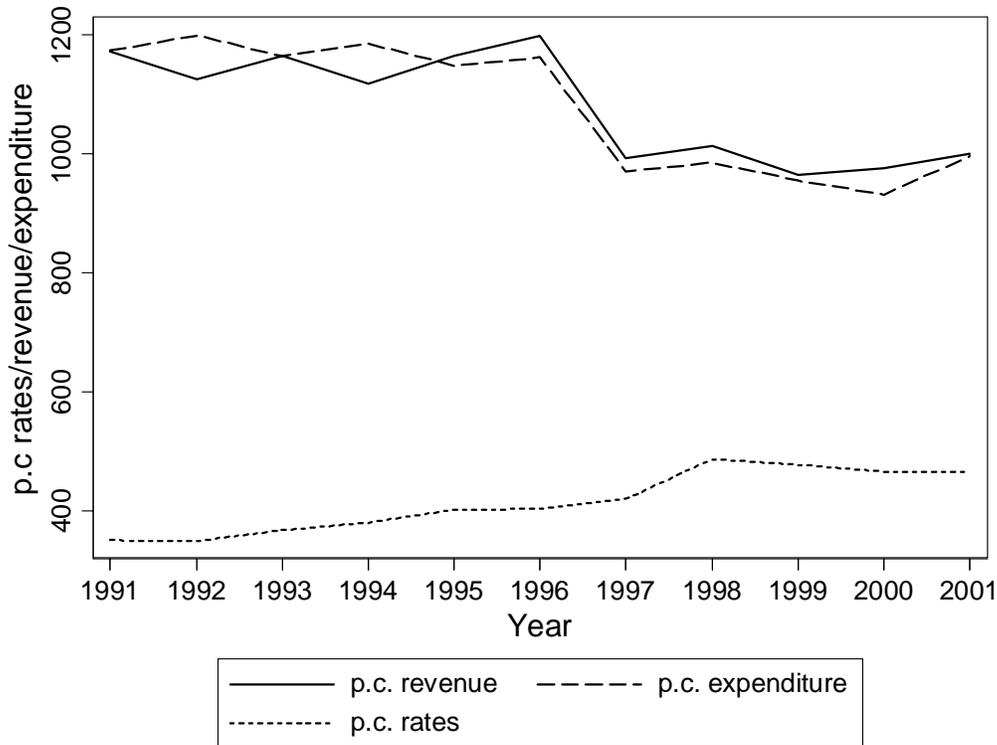
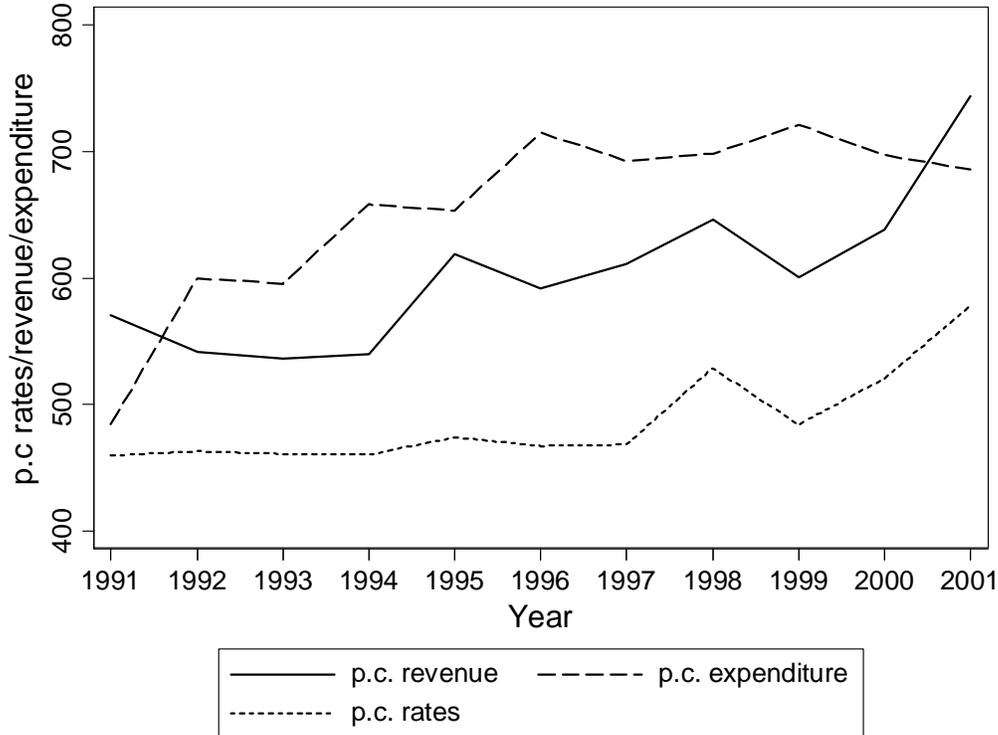


Figure 13 shows per capita rates, total revenue and total expenditure between 1991 and 2001 for Kawerau. The population fell by 16% over this period. Per capita revenue increased by 30% and per capita expenditure rose by 42%. Per capita spending on governance and administration rose by 175% in Kawerau in contrast to the decline in such spending in Invercargill. Kawerau seems to be suffering from loss in economies of scale in provision. It partially addressed this increase in costs by raising per capita rates

by 26%. However, Kawerau ran a deficit through most of the 1990s, so rates may need to rise still further to stabilise long-term finances.

Figure 13: Per Capita Rates, Revenue and Expenditure: Kawerau



Conclusions and Implications

We have now completed a simple empirical exploration of local government finances in New Zealand. We find that property taxes have some strong advantages relative to other taxes (at current rates) but that tying local service provision to local funding may create significant problems.

The theoretical benefits of land taxes are well known. This paper complements that by showing that the New Zealand national property tax base is large relative to demands placed on it, stable, and growing faster than GDP as a whole. We also point out that in the New Zealand situation, land taxes offset the effect of exempting capital gains on residential properties and the flow of services from owner occupied homes from taxation. Capital gains are significant sources of lump sum gain, so they are efficient to tax. We also find that land taxes appear to be more progressive than capital value taxes. This result is strongly consistent at a range of scales and across all TLAs and years. This should make them attractive to governments concerned about vertical equity.

On the other hand, we find some potentially serious consequences of reliance on local tax bases to fund local services if there is little or no redistribution across authorities. Tax

bases vary greatly across TLAs, and poorer TLAs have lower tax bases per capita. Thus, in comparison to a nationally funded system where expenditure might be roughly equalised per capita, the level of services TLAs can afford varies greatly. Neighbouring TLAs can experience very different tax bases and hence cost of services, meaning that firms that are very close geographically might face very different rates and services. Some of this variance could be an efficient response to different local conditions but the variance seems likely to be greater than optimal.

Even more significant is the effect of uncontrollable shocks on local government finances. New Zealand is a very open economy and its population is highly mobile. The populations and economies of local authorities are very small and often relatively undiversified. This means that uncontrolled external shocks alter population and tax bases in sometimes dramatic ways and TLAs have to respond to shocks that are beyond their control.

TLAs respond very differently to growth and decline. Some seem to struggle with the adjustment. Part of this relates back to their initial wealth and level of services. Poorer local authorities also find change harder to deal with.

Our work raises several important questions that might be the subject of further productive research. Would greater sharing of revenue across TLAs be more equitable and efficient? Does funding local government locally force TLAs to over-respond to shocks? Are the accountability gains from local financing worth the fiscal stress imposed on TLAs? In other areas we fund services out of central government revenue but still have a certain amount of local discretion in how and what is provided. For example, health is centrally funded but controlled by Area Health Boards. Education is (mainly) centrally funded but elected school boards control budgets. In what ways are local government services different?

A detailed examination of the merits of greater revenue sharing or central funding of local government would need to explore the wide variety of models in other arenas and elsewhere in the world. To date, we have not undertaken this detailed exploration, but the preliminary work detailed above indicates that such an examination is warranted according to both equity and efficiency concerns.

References

- Ballard, Charles L., John B. Shoven and John Whalley. 1985. "General equilibrium computations of the marginal welfare costs of taxes in the United States," *American Economic Review*, 75, pp. 128–38.
- Bradford, David F. and Wallace E. Oates. 1971a. "Towards a predictive theory of intergovernmental grants," *American Economic Review*, 61:2, pp. 440–5.
- Bradford, David F. and Wallace E. Oates. 1971b. "Suburban exploitation of central cities and governmental structure," in *Redistribution Through Public Choice*. Harold Hochman and George Peterson, eds. New York: Columbia University Press, pp. 43–90.
- Chapman, Jeffrey I. 1999. "Local government. Fiscal autonomy and fiscal stress: The case of California," Lincoln Institute of Land Policy Working Paper, Lincoln Institute of Land Policy, Cambridge, MA.
- Choy, Wai-Kin, Dave Maré and Peter Mawson. 2002. "Modelling regional labour market adjustment in New Zealand," New Zealand Treasury Working Paper 02/01, New Zealand Treasury, Wellington. Available online at <http://www.treasury.govt.nz/workingpapers/2002/02-1.asp>.
- Claridge, Megan and Suzi Kerr. 1998. "A case study for devolution: The problem of preserving kiwi habitat in the Far North," *Victoria Economic Commentary*, 15(2): November, pp. 27–36.
- Colegrave, Fraser. 2002. "CV-based rates 'benefit the rich at the expense of the poor,'" manuscript, Covec Limited, Auckland, New Zealand.
- Diewert, W.E. and D.A. Lawrence. 1994. *The marginal costs of taxation in New Zealand*, New Zealand Business Roundtable.
- Diewert, W.E. and D.A. Lawrence. 1996. "The deadweight costs of taxation in New Zealand," *Canadian Journal of Economics*, 29:Special Issue, pp. S658–73.
- Feldstein, Martin. 1977. "The surprising incidence of a tax on pure rent: A new answer to an old question," *Journal of Political Economy*, pp. 349–60.
- Fischel, William. 2001. *The homevoter hypothesis: How home values influence local government taxation, school finance, and land-use policies*, Cambridge, MA: Harvard University Press.
- Fisher, R. 1982. "Income and grant effects on local expenditure: The flypaper effect and other difficulties," *Journal of Urban Economics*, 12:November, pp. 324–45.

- Gamkhar, Shama and Wallace E. Oates. 1996. "Asymmetries in the response to increases and decreases in intergovernmental grants: Some empirical findings," *National Tax Journal*, 49:4, pp. 501–12.
- George, H. 1879. *Progress and poverty*, New York: Robert Schalkenbach Foundation (1992 edition).
- Glaeser, Edward and Joseph Gyourko. 2001. "Why do people still live in the rust belt? The effect of bricks and mortar on urban decline," paper presented at NBER Summer Institute, September.
- Gramlich, Edward M. 1977. "Intergovernmental grants: A review of the empirical literature," in *The Political Economy of Fiscal Federalism*, Wallace Oates, ed. Lexington, MA: Heath-Lexington, pp. 219–39.
- Grimes, Arthur, Suzi Kerr and Andrew Aitken. 2003. "Housing and economic adjustment," Motu Working Paper 03-09, Motu Economic and Public Policy Research Trust, Wellington. Available online at www.motu.org.nz/motu_wp_series.htm.
- Hines, James R. and Richard H. Thaler. 1995. "Anomalies: The flypaper effect," *Journal of Economic Perspectives*, 9:4, pp. 217–26.
- Jorgenson, D.W. and K.-Y. Yun. 1990. "Tax reform and U.S. economic growth," *Journal of Political Economy*, 98, pp. S151–93.
- Kerr, Suzi, Megan Claridge and Dominic Milicich. 1998. "Devolution and the New Zealand Resource Management Act," New Zealand Treasury Working Paper 98/7, New Zealand Treasury, Wellington. Available online at www.treasury.govt.nz/workingpapers/1998/98-7.asp.
- Kerr, Suzi and Jason Timmins. 2000. "Economic geography and spatial statistics: Theory and empirics of New Zealand regions," New Zealand Treasury Working Paper 00/11, New Zealand Treasury, Wellington. Available online at www.treasury.govt.nz/workingpapers/2000/00-11.asp.
- Kerr, S., D. Maré, W. Power and J. Timmins. 2001. "Internal mobility in New Zealand," New Zealand Treasury Working Paper 01/4, New Zealand Treasury, Wellington. Available online at www.treasury.govt.nz/workingpapers/2001/01-4.asp.
- Krugman, P. 1991. *Geography and trade*, Cambridge, MA: MIT Press.
- Maré, Dave, Peter Mawson and Jason Timmins. 2001. "Deprivation in New Zealand: Regional patterns and changes," New Zealand Treasury Working Paper 01/9, New Zealand Treasury, Wellington. Available online at www.treasury.govt.nz/workingpapers/2001/01-9.asp.

- Maré, Dave and Jason Timmins. 2003. "Internal migration and regional labour markets in New Zealand," paper presented at the New Zealand Association of Economists, June.
- McCluskey, William, Arthur Grimes and Jason Timmins. 2002. "Property taxation in New Zealand," Lincoln Institute of Land Policy Working Paper WP02WM1, Lincoln Institute of Land Policy, Cambridge, MA.
- Oates, Wallace. 1999. "An essay on fiscal federalism," *Journal of Economic Literature*, 37:3, pp. 1120–49.
- Tiebout, C. 1956. "A pure theory of local expenditures," *Journal of Political Economy*, 64:October, pp. 416–24.

Endnotes

- ¹ As reported on www.ratesrebellion.org.nz.
- ² Reported by Bernard Orsman in the New Zealand Herald 22.08.2003.
- ³ As reported by Bernard Orsman in the New Zealand Herald 22.08.2003.
- ⁴ Income from investments forms an important source of funding for some local authorities but the investments must come from somewhere. They either represent luck, in that the local authority acquired an asset from central government or elsewhere, or saving out of earlier funding. Similarly, loans are funding out of future revenue, not an independent source of funds.
- ⁵ See Claridge and Kerr (1998) for discussion of the provision of kiwi habitat.
- ⁶ They calculate this by raising all distortionary taxes simultaneously by 1%.
- ⁷ See Feldstein (1977) for a full explanation of this argument.
- ⁸ See for example the survey by Oates (1999).
- ⁹ We have excluded one TLA, the Chatham Islands, because it is extremely small.
- ¹⁰ Rates plus user charges and income from utilities.
- ¹¹ In 1999, Waitomo District council received an \$8 million financial payment from Inframax Construction Ltd. This amounted to a 56% increase in total revenue in 2001. The rate in 2001 was \$677 (23% of per capita revenue).
- ¹² See Maré et al (2001).
- ¹³ The nine local authorities that have switched (with the date of the switch in brackets) are: Dunedin (1989), Tasman (1991), Banks Peninsula (1992), South Waikato (1993), Invercargill (1994), South Taranaki (1994), Otorohanga (1996), Lower Hutt (1997) and Franklin (1999).
- ¹⁴ We include fixed effects for each TLA, so we are only comparing income and property values within TLAs.
- ¹⁵ Colegrave (2002) finds a similar relationship between meshblocks (around 100 people) in Auckland City.
- ¹⁶ In theory, an intergovernmental grant should have the same effect on local budgets as an equal increase in private incomes in the community (Bradford and Oates, 1971a, 1971b). In reality researchers find anomalous behaviour. Hines and Thaler (1995) summarise the evidence that shows that local governments respond differently to intergovernmental grants than to changes in private income.
- ¹⁷ Curiously, the per capita tax base can appear to rise because property values do not fall as fast as population. This is the case in Kawerau. It could be a result of property prices and valuations that are sticky downward. Even though there is probably “excess” housing in Kawerau since the population decline, prices may be supported by expectations and option values relating to the possibility of a recovery in the area.
- ¹⁸ This is a derived variable being the remainder of expenditure excluding parks and community facilities, roading, sewerage, refuse and stormwater, and water treatment and supply.