



Motu Research Update

Motu Economic & Public Policy Research

www.motu.org.nz

Sheep or cows?

Since the mid to late 1990s, the share of New Zealand land used for sheep and beef production has declined, while that used for dairy has soared.

Figure 1 shows that the decline in sheep/beef land closely tracks the fall in prices for sheep and beef products. This makes sense using simple economic theory. In contrast, however, the rise in dairy land is not obviously associated with a rise in dairy prices. The limited stock of land drives this. If one use goes down, another must go up. All land uses respond to all prices. Motu has jointly estimated the response of four major land uses—sheep/beef, dairy, plantation forests and scrub—to the export prices of each, using annual data, since 1974. We find that sheep/beef and dairy respond strongly to their own prices as well as negatively to each

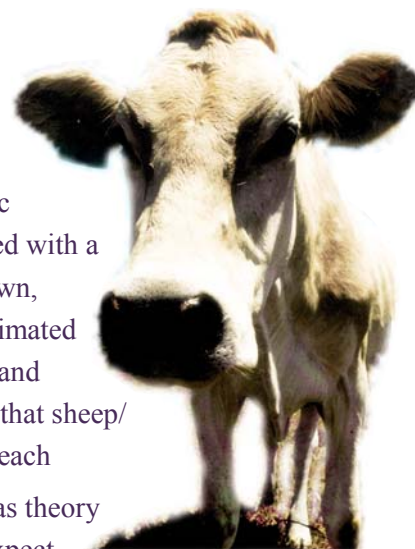
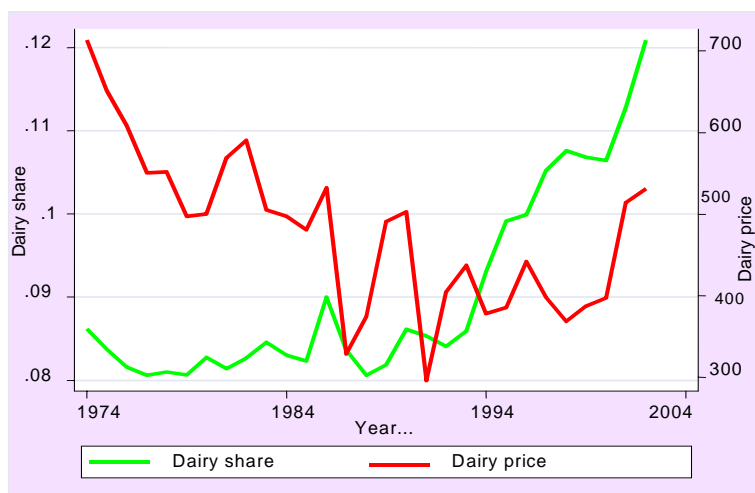
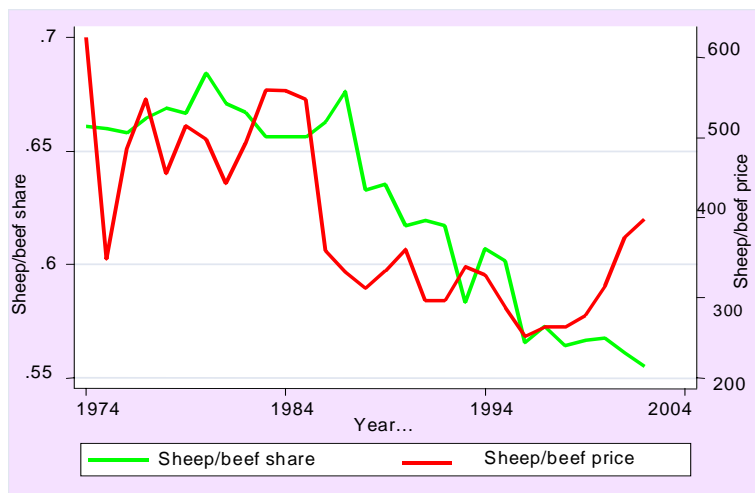


Figure 1: Land use and export prices



other's, as theory would expect.

The early part of the dairy boom might have been caused as much by a fall in prices for sheep products as a rise in dairy profitability. (This work is funded by the Foundation for Research, Science and Technology under our project on 'Land-use, climate change and Kyoto'.) For more information go to: www.motu.org.nz/land_use_nz.htm.

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Letter from the Director



The six months since our last newsletter have flown by with lots of debate, discussion and new ideas in our fun and comfortable new Cuba Mall offices.

Steve Stillman,

Andrew Coleman and Richard Newell have been wonderful additions to the team. We have produced ten new publications, including one in the *Journal of Industrial Economics*, and have many more in the pipeline. Our public policy seminars continue to attract large, diverse audiences and promote lively discussion. A big thanks to Emma Brunton for organising them and all the speakers.

Andrew Coleman has been with us on sabbatical from the University of Michigan. While here he has given seminars within Motu, in our Public Policy Seminar series, at the Reserve Bank, Treasury, Canterbury, Massey, and Mco who run the electricity market in New Zealand. He is collecting historical information for understanding the role of Māori in the New Zealand economy. He brings passion and creativity to every issue he approaches and has been both fun and of enormous value to us.

Our two largest research programmes are both gaining momentum as they move toward the end of their second year of FRST funding. In April we held a two-day workshop on our ‘Adjustment and Inequality’ programme, involving researchers and a few end-users. Individual pieces of research are now producing robust and useful insights, and the connections between the streams of research, such as housing, migration and firm dynamics, are becoming clearer. Our researchers’ workshop was followed by the ‘New Settlers’ conference—organised mostly by the Migration Research Group at Waikato—where

research on domestic and international migration issues from Waikato, Massey, CRESA and Motu, were discussed with a wide range of policy makers. The benefits of simultaneously addressing similar issues through different disciplines became clear in the lively discussions between presentations.

At our May workshop on ‘Land Use, Climate Change and Kyoto’, Motu and Landcare Research were able to produce our first integrated spatial simulations of policy scenarios. These still require considerable refinement but the last two years of fundamental work on database construction and team building is beginning to yield tantalisingly attractive fruit. Our progress to date has been possible only with considerable support from many people and institutions—thank you all. One particularly exciting new linkage is with NIWA staff, who are working with us to understand linkages between local climate and agricultural land values. The second day of our workshop was devoted to economic modelling of land use in New Zealand—with contributions from Waikato, Lincoln, Infometrics, Forest Research, and the Ministry of Agriculture and Forestry. Each model had different advantages and we hope to build on those and strengthen all with collaborative efforts to improve common data.

In the next few months, Richard and Andrew will return to the United States. In their place we have a couple of visiting graduate students. Jason Funk is an ecologist visiting from Stanford University to work in our ‘Land Use, Climate Change and Kyoto’ programme. Robert Sourell, from Germany but a Victoria University graduate, will be working on housing issues. Steve Stillman will be full-time from 1 July and Linda Townsend has joined us as a part-time librarian. We look forward to their ideas and energy in what promises to be a productive and stimulating period.

A handwritten signature in black ink, appearing to read 'S. Kerr'.

Suzi Kerr, Director

International visitor: Professor Mike Young, CSIRO Land and Water, South Australia



An ecological economist and Director of the Policy and Economic Research Unit, CSIRO Land and Water, Mike Young is an expert on water policy and biodiversity issues. During his visit he gave a public seminar, ‘Enduring Environmental Policies’, met with key water and

conservation policy makers in Wellington, and was interviewed by Radio New Zealand.

Mike’s key message was the need to design natural resource management policies that are robust to changing circumstances. He likened designing robust policies to designing a car—a car built to run only in a straight line will eventually crash, but a car with a steering wheel, gears, and a brake will perform well under virtually all conditions. By designing adaptable policies with all the necessary controls, we can implement policies earlier, protect our natural resources sooner, and adjust over time based on learning and experience. Mike quoted Jan Tinbergen, who said that we need a separate instrument for each

objective, a message that made him the first Nobel laureate in Economics. Thus Mike recommended that the environmental objectives relating to water quality—e.g. nutrient discharges to water; the equity objectives (who is given property rights); and the allocative efficiency objectives (who has the right to use water, including the environment), are all dealt with in separate though integrated ways. Water permits should be defined as shares of a variable total so that the system can smoothly adapt to shocks such as droughts or climatic changes.

Mike visited Motu as part of our ‘Land Use, Climate Change and Kyoto’ programme, funded by the FRST, in May 2004. The ‘Land Use, Climate Change and Kyoto’ research programme involves building an integrated model of land-use change and its environmental and social impacts in New Zealand. Mike has had vast experience in simulating land-use change in response to environmental policies, including work on the Murray-Darling Basin in Australia. This, along with his experience in interdisciplinary research, made him a valuable contributor at our research workshop. For more information go to:

www.motu.org.nz/land_use_nz.htm.

Motu people



*Emma, Andrew, Jason, Jaz, Pauline,
Izi and Suzi*

Board of Trustees Apryll Parata MNZM, Grant Scobie (Chair), Steve Thompson

International Advisors Denny Ellerman, Edward Glaeser, Stephen Jenkins, John McMillan, Wally Oates, Paul Portney

Staff Andrew Aitken, Emma Brunton, Sylvia Dixon, Arthur Grimes, Jo Hendy, Pauline Hornblow, Suzi Kerr, Dave Maré, Isabelle Sin, Steve Stillman, Jason Timmins, Linda Townsend, Maxine Watene

Affiliates Andrew Coleman, John Gibson, Viv Hall, Dean Hyslop, Sholeh Maani, Tim Maloney, John McDermott, Richard Newell, James Sanchirico

Understanding the changing income distribution

By most measures, New Zealand's income distribution became more spread out between the mid 1980s and mid 1990s. The changes were large enough to attract international attention, and were of particular interest given the extensive policy reforms that had been undertaken, especially in the early part of this period.

In a recently completed paper, soon to be published in *Economica*, Dean Hyslop, a Motu affiliate who is currently at Treasury, and Motu Senior Fellow Dave Maré examine the nature of the distributional changes that occurred, and estimate the contribution that was made by various factors.

The starting point for the analysis is a graph such as that shown as Figure 2 below. The height of the graph shows the proportion of households with the level of (equivalised-log-real) income shown on the horizontal axis. The difference in the shape and position of the graphs from the two periods 1983–86 and 1995–98 is what the paper investigates. The graph shows that the peak in the middle of the 1983–86 distribution is less pronounced in the later period. A higher proportion of households have incomes that are either well above or well below the middle of the distribution. The nature of these changes would not be as obvious if we relied on simpler summaries of the income distribution, such as the median, which, as shown in the graph, dropped only slightly during the period.

In identifying the factors behind these changes, the authors use a technique that re-weights the initial

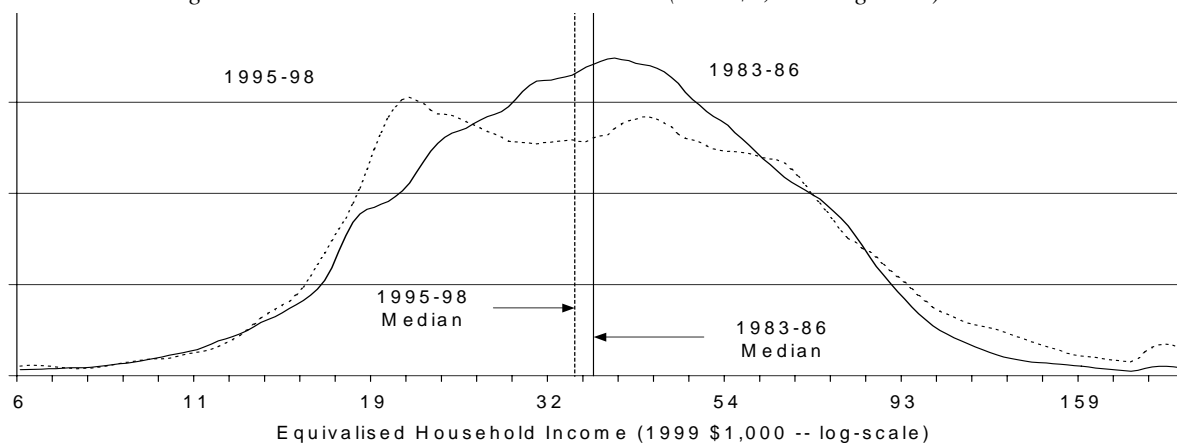
income distribution, giving more weight to households with characteristics that were more prevalent in the later period, and thus creating a series of counterfactual income distributions. One of the strengths of this approach, known as 'conditional density estimation', is that the different counterfactuals can be shown graphically, to provide a visual appreciation of where and how different factors have influenced the distribution.

The main findings of the paper are that most of the distributional change occurred in the first half of the period, and that changes in household structure and changes in socio-economic attributes (age, qualifications, gender and ethnicity mix) were the largest contributors to the observed changes. The findings are not very different using alternative income measures or different ways of equivalising household incomes.

Hyslop, D. R. and D.C. Maré. 2003. Understanding New Zealand's Changing Income Distribution 1983–98: A Semiparametric Analysis, *Motu Working Paper*, 03-16, (a condensed version is forthcoming in the journal *Economica*).

For more information go to:
www.motu.org.nz/income_distribution.htm.

Figure 2: The New Zealand household income (1999 \$1,000—log-scale)



Recent publications

- Claus, Iris and Arthur Grimes. 2003. 'Asymmetric Information, Financial Intermediation & the Monetary Transmission Mechanism: A Critical Review', Treasury Working Paper 03/19, available online at www.treasury.govt.nz/workingpapers/2003/twp03-19.pdf.
- Grimes, Arthur, Suzi Kerr and Andrew Aitken. 2003. 'House Prices and Regional Adjustment', New Zealand Geographical Society 22nd Conference Proceedings, pp. 238–241, and paper prepared for the Centre for Housing Research New Zealand.
- Hyslop, Dean, Dave Maré and Jason Timmins. 2003. 'Qualifications, Employment and the Value of Human Capital, 1986-2001', Treasury Working Paper 03/35.
- Kerr, Suzi and Richard G. Newell. 2003. 'Policy-Induced Technology Adoption: Evidence from the U.S Lead Phasedown', *Journal of Industrial Economics*. Vol. LI, No. 3.
- Kerr, Suzi, Richard G. Newell and James N. Sanchirico. 2004. 'Evaluating the New Zealand Individual Transferable Quota Market for Fisheries Management,' in *Tradeable Permits Policy Evaluation, Design and Reform*: OECD pp 121–134.

Recent Motu working papers

- 04-01. Kerr, Suzi; Andrew Aitken and Arthur Grimes, 'Land Taxes and Revenue Needs as Communities Grow and Decline: Evidence from New Zealand'.
- 03-19. Maré, David C, 'Ideas for Growth?'
- 03-18. Fabling, Richard and Arthur Grimes, 'Insolvency and Economic Development: Regional Variation and Adjustment'.
- 03-17. Kerr, Suzi; Susana Cardenas and Joanna Hendy, 'Migration and the Environment in the Galapagos: An analysis of economic and policy incentives driving migration, potential impacts from migration control, and potential policies to reduce migration pressure'. Spanish Version 'Migración y Ambiente en las Islas Galápagos' published by the World Wildlife Fund, 2003.
- 03-16. Hyslop, Dean R. and David C. Maré, 'Understanding New Zealand's Changing Income Distribution 1983-98: A Semiparametric Analysis'.

For a complete list of publications and to download papers go to: www.motu.org.nz/pub.htm.

Public policy seminars

The Motu seminar series continues to be a success with high attendance at each event. The series aims to disseminate the results of our research and to make existing knowledge more accessible for policy debates in New Zealand. Seminars are given by Motu staff and affiliates as well as other leading New Zealand and international researchers. It is designed to be accessible to people not deeply involved in research (such as policy analysts) who want to keep up with research developments in particular areas, as well as to the wider public who may have an interest in a particular issue.

Recent seminars were: Richard G. Newell, 'Technology policy for energy and the environment'; Dean Hyslop 'The impact of an earning subsidy on beneficiaries: Evidence from a long-term social experiment'; Tim Maloney 'Lessons learned for Social Policy: Evidence from the Christchurch Health and Development study'; Mike Young, 'Enduring environmental policies'; and Andrew Coleman, 'In praise of more monies: How different mortgage contracts could end the exchange rate cycle'.

Upcoming seminars:

18 June 2004 'Location as a moving target' Dave Maré, Senior Fellow, Motu Economic and Public Policy Research.

8 July 2004 'Social policy insights from longitudinal data' Stephen Jenkins, Professor of Applied Economics, Institute for Social and Economic Research (ISER), University of Essex, United Kingdom.

All presentations and seminar schedules are available online at www.motu.org.nz/teaching.htm.

What is typical New Zealand?

If a visitor to New Zealand wants to experience a typical New Zealand community they should skip Auckland and head straight to Hamilton. Dave Maré and Jason Timmins have been examining the population characteristics of labour market areas—communities defined by commuting patterns—within New Zealand.

The study uses summary measures across a range of demographic indicators from the Census, to investigate how dissimilar communities are from New Zealand as a whole, and from each other.

Five demographic indicators—age, ethnicity, qualifications, industry and occupation—collected by the Census between 1986 and 2001 were used to summarise the population composition of New Zealand communities.

Figure 3 represents the average difference between the community's population composition and that of New Zealand across the five demographic indicators and the four census years.

The highlighted communities are the most (shaded grey) and least (shaded black) like the New Zealand population. In descending order the

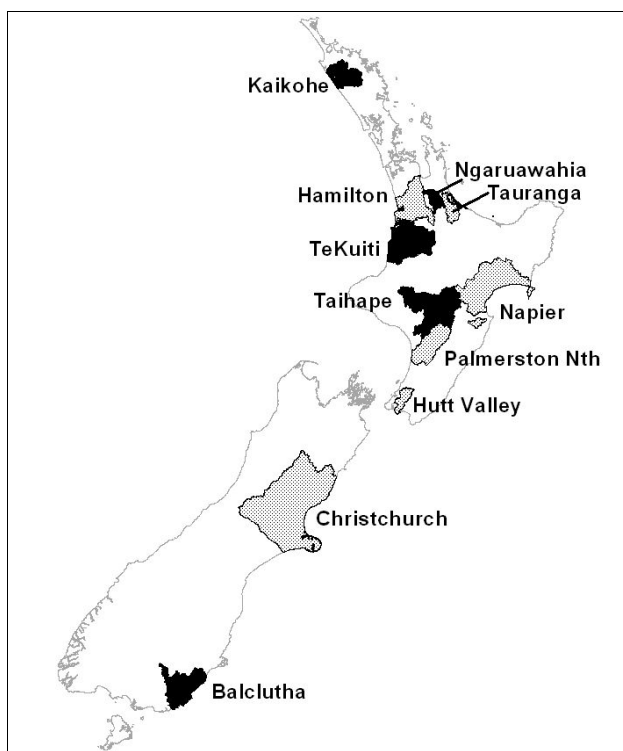
communities most like NZ are Hamilton, Palmerston North, Hutt Valley, Christchurch, Tauranga and Napier, and the communities least like NZ are Kaikohe, Otorohanga, Ngaruawahia, Taihape, Te Kuiti and Balclutha.

The reasons communities differ from the national composition are not always the same. For example, the communities of South Auckland and Ashburton had identical dissimilarity scores when comparing their respective ethnic group compositions to the national composition. South Auckland has a more diverse ethnic mix, with an over-representation of Māori, Pacific Island and Asian ethnic groups, whereas in Ashburton the ethnic mix is more concentrated, with 92 % of the population belonging to the European ethnic group, compared with 77 % nationally.

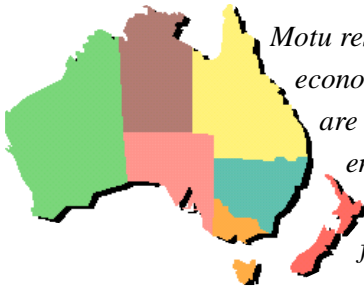
Understanding variation in demographic characteristics across New Zealand forms part of our FRST-funded research programme to understand geographic community dynamics. The characteristics of a community's population may influence the ability of the community to absorb and respond to an economic shock. For example, a shock to the New Zealand agricultural sector is likely to have a greater impact on the community of Otorohanga, where 40 % of the employment is identified as agricultural, compared to Wellington, where only 1 % of those employed work within the agricultural sector. Further analysis will focus on measuring how diverse a community's population characteristics are and whether this has any effect on how well the community adapts to economic change.

Maré, David C and Jason Timmins, 'Variation in community characteristics' will be presented at the NZAEs' Conference 2004, and will subsequently be available as a Motu Working Paper.

Figure 3: Communities most like and most different from New Zealand as a whole



New Zealand: Australasian manufacturing centre



Motu researchers are investigating whether New Zealand is a typical Australasian economy. Part of the research examines trends in industrial structure. Industry shares are calculated for each Australian state and territory and for New Zealand using employment data in each of nine industries relative to total employment in each economy. The work has uncovered some surprising results that may be important for understanding New Zealand's economic development prospects.

First—not surprisingly—New Zealand has the highest trend employment share in *Agriculture, Fishing and Forestry*, just ahead of Tasmania. New Zealand's share has been falling (from 11% in 1985 to 9% in 2002), mirroring the fall in Australasia as a whole (from 7% to near 5%).

Second—surprisingly—New Zealand has the largest *Manufacturing* share of any Australasian economy, just ahead of Victoria. Our 2002 *Manufacturing* share (15%) considerably exceeds that of New South Wales and Queensland (11% and 10% respectively). New Zealand's *Manufacturing* share has declined since 1985 (from 21% to 15%), but so too has the share across the whole of Australasia (from 17% in 1985 to 13% in 2002). The decline in New Zealand's *Manufacturing* share is not abnormal.

So where do New Zealand's industrial shares fall short of other economies? A third key finding is that New Zealand has consistently had a low employment share in *Construction*, averaging 6%, compared with the fastest growing economies (Queensland and Western Australia), which have averaged an 8% share. The Australasian average rate is 7%. This finding is consistent with other evidence that New Zealand operates with a low capital stock relative to that in Australia.

Fourth, New Zealand has a much lower involvement in 'new economy' *Business and Financial Services* compared with NSW and Victoria, and is low even compared with Western Australia, Queensland and South Australia. Between 1985 and 2002, NSW's share in this area increased 6 percentage points to 18%; New

Zealand's share increased 4 percentage points to around 12.5%.

Of course, all states exhibit industry differences relative to the entire Australasian economy. A measure of these differences across all industries shows New Zealand to be as close to the average Australasian industrial structure as is NSW (Victoria and South Australia are closest; Tasmania and the two territories are most distant). In this sense we are a typical Australasian economy. But the points of difference—especially the low shares in *Business and Financial Services* and *Construction*—identify some important issues to be considered in analysing New Zealand's longer term development prospects. The research is funded by the Royal Society of New Zealand through a Marsden Fund grant. For more information contact: arthur.grimes@motu.org.nz.



Internal migration & local labour markets

New Zealanders are very mobile. About half of us change location at least once every five years. Dave Maré and Jason Timmins have been examining the links between the patterns of movement within New Zealand and the job prospects in different local labour markets, focusing on local labour market areas, defined by commuting patterns.

It turns out that migration is more important for local labour markets than local labour markets are for migration.

Local employment growth spurs greater in-migration and reduces losses due to out-migration. The migration response is strong. A boost to local employment growth would be met entirely by in-migrants within five years, were it not for other changes that are set in train by the employment growth or by the in-migration itself. For instance, employment growth and in-migration both lead to increased local house prices, which puts a brake on in-migration.

Our analysis suggests that relative labour market conditions are a more important factor in people's decision about where to move to than they are in the decision of whether to move or not. There is greater variability in inflow rates than in outflow rates, and inflow rates are more highly correlated with local conditions.

Perhaps paradoxically, relative local labour market prospects can explain only a small portion of migration flows, despite the central role that migration plays in local labour market adjustment. Many people leave areas with impressive employment growth, or move to areas where employment is declining. For instance, between 1996 and 2001, employment in the commuting area around Invercargill declined by 4.5%, yet in-migration over the same period amounted to 14% of the initial population, and was more than balanced by outflows that were almost twice as large.

In contrast, employment around Tauranga grew by 18%, yet around 20% of the 1996 population had left by 2001. Inflows of nearly 40% were needed to achieve Tauranga's 19% population growth.

Our modelling of both inflows and outflows has allowed us to look at both gross and net migration flows, as well as the effect of different measures of distance. We have confirmed the deterrent effect of geographic distance and the barrier that Cook Strait represents. We also found that migration flows are stronger between areas that have similar ethnic and occupational mixes, and where two-way flows have been strong in the past.

We are continuing our research into internal migration patterns



within New Zealand, as part of our FRST-funded research programme to understand geographic community dynamics. Over the coming months we will be extending our analysis by looking at individuals' migration decisions, paying particular attention to who is most likely to migrate and who is most responsive to local labour market conditions. We will also be separately analyzing mobility patterns of Māori, and looking at what mobility patterns mean for the changing composition of communities where employment is declining.

Maré, David C and Jason Timmins, 'Migration and Local Labour Markets in New Zealand' will be presented at the NZ Association of Economists' conference, and will subsequently be available as a Motu Working Paper.

For more information go to:

www.motu.org.nz/adjust_inequality.htm.

