



MOTU RESEARCH UPDATE - ISSUE 28 - NOVEMBER 2018

New data tool scores countries on human rights performance

This year, the Universal Declaration of Human Rights marks its 70th anniversary, but despite progress in some areas, it remains difficult to measure or compare governments' performance. We have yet to develop comprehensive human rights measures that are accepted by researchers, policymakers and advocates alike. With this in mind, Anne-Marie Brook, a policy fellow at Motu, and some colleagues from the USA started the Human Rights Measurement Initiative (HRMI), the first global project to develop a comprehensive suite of metrics covering international human rights. Earlier this year, HRMI released its beta dataset and data visualisation tools, publishing 12 metrics that cover five economic and social rights and seven civil and political rights.

Lack of human rights data

People often assume the UN already produces comprehensive data on nations' human rights performance, but it does not, and likely never will. The members of the UN are governments, and governments are the very actors that are obligated by international human rights law. It would be naïve to hope for governments to effectively monitor and measure their own performance without political bias. There has to be a role for non-state measurement. We hope that the data and visualisations provided by HRMI will empower practitioners, advocates, researchers, journalists and others to speak clearly about human rights outcomes worldwide and hold governments accountable when they fail to meet their obligations under international law.

The HRMI pilot

HRMI has developed a new way of measuring civil and political human rights. This involves sending an expert survey directly to human rights practitioners who are actively monitoring each country's human rights situation. The survey asks respondents about their country's performance on the rights to assembly and association, opinion and expression, political participation, freedom from torture, freedom from disappearance, freedom from execution, and freedom from arbitrary or political arrest and imprisonment.

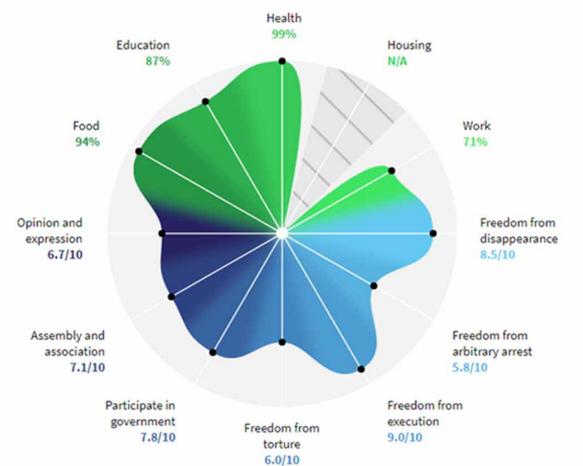
Based on those survey responses, HRMI develops data on the overall level of respect for each of the rights. These data are calculated using a statistical method that ensures responses are comparable across experts and countries, and with an uncertainty band to provide transparency about how confident we are in each country's placement. HRMI also provides information on who our respondents believed were especially at risk for each type of human rights violation.

Australia's Human Rights Performance

One way to visualise data on our website is to look at a country's performance across all 12 human rights for which we have released data at this time.

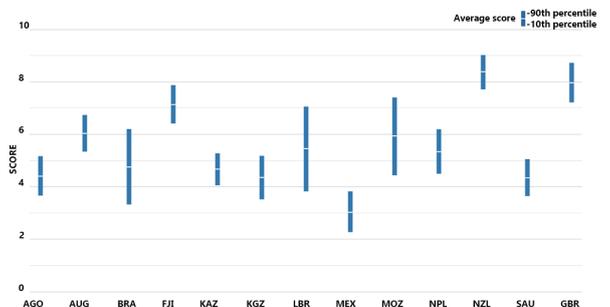
Looking at civil and political rights (in blue), Australia demonstrates high respect for the right to be free from execution but does much worse on the rights to be free from torture and arbitrary arrest. The HRMI survey respondents often attributed this poor performance on torture and imprisonment to the treatment of refugees, immigrants and asylum seekers, as well as Indigenous peoples, by the Australian government.

Looking across the economic and social rights (in green), Australia shows a range of performance, doing quite well on the right to food, but performing far worse on the right to work. (Data necessary to calculate a metric for the right to housing at a high-income OECD assessment standard is currently unavailable for Australia.)



Freedom from torture across countries

Another way to visualise the HRMI data is to look at respect for a single right across several countries. The graph below shows overall government respect for the right to be free from torture and ill treatment in all 13 of HRMI's pilot countries between January and June 2017. Here, the middle of each blue bar (marked by the small horizontal white lines) represents the average estimated level of respect for freedom from torture, while the length of the blue bars demonstrate our certainty in our estimates. For instance, we are much more certain regarding Mexico's (MEX) low score than Brazil's (BRA) higher score. Due to this uncertainty and the resulting overlap between the bars, there is only a 92% chance that Brazil's score is better than Mexico's.



In addition to being able to say that torture is probably more prevalent in Mexico than in Brazil, and how certain we are in that comparison, we can also compare the groups of people that our respondents said were at greatest risk of torture. There is much more to be learned from the visualisations and data on the HRMI website and we encourage you to have a look for yourself.

Director's Letter, Publications and Events 2
 A New Zealand-focused global model for climate policy analysis 3
 Parenthood and the gender wage gap 4
 Our People 5

Motu Publications 6
 Regional complexity and growth 7
 Wellbeing and the living standards framework 8

Director's Letter

Over the last year Motu has undertaken an exciting range of important projects. The following examples illustrate their breadth and depth:

- more than 75 external presentations, 14 externally published articles, 13 Motu Working Papers and, in several cases, significant media comment;
- the completion of the pilot phase of the Human Rights Measurement Initiative (HRMI), including harnessing international enthusiasm and funding;
- two major research papers on the gender wage gap that generated significant press attention;
- research to increase the role that native forests can play in helping to bring economic, environmental and social benefits to Māori on the East Cape;
- work with two National Science Challenges: the Deep South and Building Better Homes, Towns and Cities;
- Shaping New Zealand's Low-Emission Future, a project to help inform climate change policymaking and private-sector actions, and significantly benefit New Zealand's longer-term development; and
- ongoing work with Te Pūnaha Matatini, a Centre of Research Excellence focused on the characterisation and analysis of complex systems and networks.

With sadness, but no little pride, Motu has announced that Suzi Kerr has accepted a position as the Chief Economist at Environmental Defense Fund in New York and will leave Motu in April 2019. Suzi's new role is a recognition of everything she has built over the course of her distinguished career and an acknowledgement of her world-class work. We have been blessed to have Suzi's passion and intellect at Motu, and her role in our genesis is part of what makes us the organisation we are today. That legacy will stay with us in how we look to build economic and public policy capacity in Aotearoa and in our commitment to contributing strong, non-partisan research.

One of the great contributions Suzi made to Motu was in helping to hire Isabelle Sin back in the early 2000s. Izi was one of our first research analysts when she was just out of Canterbury University, back when the organisation was getting started. She went on to gain an impressive doctorate from Stanford before returning to Motu as a Fellow. This year, we promoted her to Senior Fellow, and watched as she was appointed to the Government's Fair Pay Agreement Working Group, and handled media, policymakers, politicians and researchers with incisive aplomb in relation to her gender wage gap research.

We also appointed a brand-new Senior Fellow. Niven Winchester worked at the Massachusetts Institute of Technology (MIT) for 10 years and wanted to return home to New Zealand. His research focuses on analyses of climate, energy and trade policies using computable general equilibrium models. Niven provides Aotearoa with much-needed expertise in modelling; in fact, his research on sports ranking systems was the catalyst for the change to the bonus point system in Super Rugby in 2016.

In addition, we have employed two new Fellows this year. Lynn Riggs has extensive experience with large confidential data sets and researches health, labour, education and financial economics. Élodie Blanc has also been working at MIT, and her research interests include agricultural economics, applied econometrics, water modelling and crop modelling. We also welcomed new research analysts Ben Davies, Dom White and Sophie Hale, who are hitting their paces well.

I am constantly amazed at how this unique organisation punches above its weight. It has been an honour and a privilege for me to be part of this journey. Soon, however, it will be time for me to hand the baton to an Executive Director, with whom I look forward to working as I return to my role as an enthusiastic Board member.



Lesley Haines, Interim Director

Motu Publications

Motu is committed to making the results of its research on key issues facing New Zealand accessible to public and private decision-makers and the general public.

Subscriptions to our two publication series, the [Motu Working Paper Series](#) and [Motu Notes](#), are both available free from our website. You can also sign up to receive all our work in a particular research area.

You can also sign up for events and our newsletters: [Motu News](#) (bimonthly) and [Motu Research Update](#) (annual). If you like shorter, more regular updates, you may prefer Motu News; if you want more substantive and less frequent updates, you will prefer Motu Research Update.

We also have a biannual bulletin designed to inform policy analysts and researchers of upcoming research and analysis.

Public Policy Seminars

Motu's Public Policy Seminar series provides a forum for informed debate on important public policy issues. Through the series, we aim to make the latest economic research more accessible to inform policy debates in New Zealand.

Our seminars are accessible to a wide audience, and are attended by people from diverse backgrounds who want to stay informed on economic, social and public policy research.

The seminars are presented by Motu Senior Fellows and Affiliates, as well as other top visiting academics from around the world. These seminars are free to the public, and there is no need to register to attend.

Since the last newsletter, we have hosted a number of Public Policy Seminars. Presentation material from these seminars, including slides, is available [online](#).

To receive our email publications, or for invitations to Motu seminars, sign up at <http://motu.nz/newsletter/>.



A New Zealand-focused global model for climate policy analysis

As New Zealand joins with other countries to achieve net zero greenhouse gas emissions by later this century, it will come under increasing pressure from changing economic opportunities and global consumer preferences, the emergence of potentially disruptive new technologies, natural resource constraints, and evolving social and political drivers. New Zealand faces the challenge of developing its economy in ways that will not only be resilient to those future pressures, but also sustain the well-being of both urban and rural communities as well as our natural environment.

High-quality modelling tools and data are essential for making robust decisions on New Zealand's transition to a low-emission economy in a changing and uncertain world. Drawing from a stocktake of modelling capability and needs in New Zealand developed in collaboration with a broad range of experts, we have identified the need – and opportunity – to develop an integrated framework for climate change mitigation modelling in New Zealand.

WHAT IS A MODEL?

A model is a simplified representation of reality that focuses on the key factors and (cause-and-effect) relationships of a phenomenon. Models describe how these factors are related, and the strengths of the different relationships. Constructing a model requires scientists to specify their assumptions explicitly, identify the phenomena they are concerned with, explain their methodology and use data to calibrate the model. By capturing the key agents, elements, processes and decisions, models enable complex systems and situations to be understood and complex problems to be solved.

People may think like a modeller when making a decision in a complex situation. They select certain key details, make assumptions about details they have ignored, and apply judgement to inform their decisions. Scientists make these models more explicit.

WHY ARE THERE DIFFERENT MODELS?

Modelling climate change mitigation options requires, among other factors,

- characterising farm-level production and alternative production techniques;
- identifying the drivers of land-use change at national and regional scales;
- resolving hourly electricity demand, intermittent electricity generation from wind and solar, and inter-annual variation in the availability of hydro-electricity;
- characterizing the fleet of transportation vehicles and barriers to the adoption of electric vehicles; and
- representing interactions among different sectors of the economy.

Different types of models can be required to answer different types of questions, to model different situations and to work at different levels of detail. Such models typically apply different assumptions, face different limitations, and use different data, levels of detail, and methodologies. As the economic, environmental and other impacts from changes in technologies, land-use, policies and practices may be too complex for any one model to capture fully, using multiple models in combination can provide a more complete and robust understanding. In addition, cross-model comparisons can be used to help validate the different models. Furthermore, models that represent one aspect of an economy in detail can be used to inform models with a broader representation.

MODELS IN NEW ZEALAND

Under the Paris Agreement, New Zealand must transition toward a net-zero-emissions economy. As a matter of both near-term urgency and enduring need, building on a sound foundation of existing work, improved modelling would assist New Zealand to design an effective portfolio of policies and measures to reduce emissions and manage the distributional effects on regions, sectors, communities and households. More specifically, models are required to set emission-reduction goals, and in the shorter term, emission budgets, ETS caps and price safeguards. These decisions need to take into account changes in technologies, policies and markets, both in New Zealand and internationally.

Earlier this year, Motu Economic and Public Policy Research convened two workshops in Wellington, New Zealand, bringing together some of the country's most expert researchers in agriculture and resource economics, energy sector economics, and economy-wide modelling from government, research institutions and industry organisations. The intent of the workshops was to begin designing a more strategic approach across the modelling community.

AN INTEGRATED FRAMEWORK

We believe we need to create an integrated framework for climate change mitigation modelling in New Zealand. This framework would regularly bring together a suite of models and a network of researchers to assess climate change mitigation policies. Core elements of the framework would include a central repository of data, common input assumptions and scenarios, and a “dashboard” that synthesises results from different models, allowing decision-makers to understand and apply the insights from the models more easily. The framework would also have several other benefits. First, it could be used to improve linkages among models and ultimately allow each model to capitalise on the strength of other models in the framework. Second, enabling modellers to access high-quality datasets and apply consistent assumptions and scenarios would improve transparency and facilitate comparison of model outputs. Third, the framework would provide a centralised, formal channel for international collaboration.

Sustained investment in a modelling framework will create an “ecosystem” for climate change mitigation modelling in New Zealand. It would help to ensure that New Zealand's models are fit for purpose and ready to deploy when the policy demand becomes urgent.



Parenthood and the gender wage gap

In New Zealand, the gender pay gap has fallen over the past 20 years and it is now below 10%. Earlier research shows that a high proportion of the gender pay gap can't be explained by differences in observable information, such as age, education, occupation and industry, and nor is it due to differences in productivity.

New Zealand is similar to the rest of the world in that the gender pay gap is larger among parents than people without children, although the reasons for this are not entirely clear. Our research uses newly combined data to describe what happens to men's and women's employment and wages after they become parents. It shows a strongly gendered labour response to parenthood: women dramatically decrease their employment and work fewer hours if they are employed, whereas men's employment and hours worked barely change. Mothers, particularly those with high incomes before parenthood, experience lower monthly incomes and hourly wages than before they had children. These reductions are larger the longer they are away from paid work, and persist for at least ten years. Furthermore, high-income women who return to paid employment soon after becoming parents experience dramatically and persistently slower rates of income growth compared to before. They are therefore likely to have much lower lifetime earnings than similarly high-income men who become fathers.

Changes in employment and earnings for women after giving birth are likely to be related to social norms as well as the ability to breastfeed. We need to ask why so few men become the primary caregiver of their children?

Employment gaps

Our work shows that few men stop paid employment after having a child, but only three out of five first-time mothers do any paid work before their child's first birthday. Women with higher incomes and those with higher qualifications before parenthood return more quickly to work after childbearing and maintain higher employment rates. Only 45% of mothers with no qualifications are employed ten years after their first baby, compared with over 60% of those with a school or higher qualification and nearly 70% of those with a bachelor's degree.

Women who became mothers when aged 25 to 34 have higher employment rates after having children than older women. The employment rate of those who became mothers when aged under 25 is lowest (only 34% in their child's second year). Before becoming mothers, Māori and Pacific women are far more likely not to be employed than Pākehā (New Zealander of European descent) women, but this gap narrows in percentage point terms after they become mothers. Pākehā mothers have a 59% employment rate in their child's tenth year compared with 41% for Pacific mothers and 45% for Māori mothers.

Monthly wage earnings

Monthly wage earnings are driven by a combination of hourly wages and monthly hours worked. They are important for a parent's ability to support his or her family and for lifetime earnings. Across every pre-parenthood income quartile, employed women experience decreases in monthly earnings when they have children, while men do not. The decreases are larger for women who return to work more slowly.

Time out of employment matters more for high-income women, but even those who return to work quickly experience much slower income growth after becoming parents. Prior to parenthood, these women were on a trajectory to be very high earners, and the dampening of their income growth helps explain why relatively few women appear in the highest income brackets. Their fast return to employment does, however, increase their earnings lead over their slower-returning colleagues. In contrast, low-income women who are employed experience small monthly income decreases with parenthood and similar income growth rates before and after having children. However, this isn't necessarily a positive sign, as it could merely indicate that they were underemployed before motherhood.

In terms of ethnic differences, monthly income for Māori, Pacific Peoples and Asian mothers in paid employment is slightly higher in the second year after their child's birth than in the second year before it. Over the same period, employed Pākehā mothers experience the largest decrease in monthly income.

Work hours and wages

Employed mothers work a median of 27 hours, down from a pre-parenthood median of 40 hours. The longer a woman spends out of work the fewer hours she works on average upon her return. Women who return to work in the first six months work a median of 30 hours, those who returned in months 7 to 12 work a median of 27 hours, and those who return after month 12 work a median of 22 hours. Men work a median of 41 hours both before and after becoming parents.

It isn't just a decrease in hours that contributes to the wage gap. Across our sample (which is not representative of the population and so differs from the official gender wage gap), women earn 6.8% lower hourly wages than men of the same age and education. The wage difference is 5.7% between men and women without children, but 12.5% between men and women who are parents.

When men become parents, their hourly wages aren't significantly affected. Women, on the other hand, pay a price. Their hourly wages decrease by 4.4% compared with the wages they could have expected without children. This wage penalty for motherhood varies substantially with how long the woman stays at home. The longer they stay at home, the bigger the drop in their hourly wages. Only some of this drop in pay can be explained by mothers moving to lower-paying industries and occupations.

Our research shows that parenthood exacerbates pre-parenthood gender wage gaps, with time out of work and reduced hours both playing major roles. We believe that we won't see equality in the labour market until it is just as common for a dad to stay home with the kids as it is for a mum. While many mothers may want to take time away from work to raise their children, this should be a personal (or family) choice and not the result of traditional gender roles.





Our People

Comings and Goings

The culture and ethos of Motu have their beginnings in the way the organisation was dreamed up by Suzi Kerr and Dave Maré as graduate students at Harvard in the 1990s. In 2019, Suzi Kerr will step down as a Senior Fellow to become Chief Economist at the Environmental Defense Fund (EDF) in New York. This is an incredible achievement for her and we wish her well amidst our own sadness. Suzi's work with EDF will build on the expertise she has developed while at Motu and is a unique opportunity for the contributions she has made to environmental economics in New Zealand to assume an even more global form. Suzi's career move can also be viewed as part of the gaining influence of Motu on the international stage. We look to our continuing relationship with Adam Jaffe as an inspiration for how we can work with our distinguished alumni.

Awards and Recognition

Motu is the top-ranked economics organisation in New Zealand. It is in the top ten global economic think tanks, according to the Research Papers in Economics (RePEc) website, which ranks all economists and economic research organisations in the world based on the quantity and quality of their research publications.

In 2018, Motu was rated tenth in the world for climate change work internationally and second for think tanks outside of Europe and North America in the standardised Think Tank Rankings by the International Center for Climate Governance.

Capacity Building

One of Motu's crucial roles is to expand this country's economic and policy capability. We have just launched a new scholarship for rangitahi Māori who are just beginning quantitative economics at

university. We also build capacity through the employment of up-and-coming research analysts and summer interns.

In 2018, the research analyst team was joined by Ben Davies, Dom White and Sophie Hale. We have also had several local and international interns spend time at Motu.

Staff List

Interim Director: Lesley Haines

Senior Fellows: Arthur Grimes, David C. Maré, Dean R. Hyslop, Isabelle Sin, Niven Winchester, Suzi Kerr

Fellows: Angela Halliday, Anne-Marie Brooke, Catherine Leining, Élodie Blanc, Levente Timar, Lynn Riggs, Trinh Le

Senior Research Associate: Adam B. Jaffe

Research Analysts: Ben Davies, Dom White, Edmund Lou, Kate Preston, Sally Owen, Sophie Hale

Support Staff: Ceridwyn Roberts, Grant Coppersmith, Maxine Watene, Pela Arathimos

Board of Trustees

Bruce Wills (Chair), Adam B. Jaffe, David C. Maré, Jo Wills, Lesley Haines, Paul Reynolds, Peter O'Shea, Stephen Goldson.

Affiliates

Adolf Stroombergen, Andrew Coleman, Deborah Cobb-Clark, Grant Scobie, Jacques Poot, James Sanchirico, John McDermott, Les Oxley, Lew Evans, Lynda Sanderson, Malathi Velamuri, Philip McCann, Richard Fabling, Richard Newell, Robert MacCulloch, Sholeh Maani, Steve Stillman, Tim Maloney, Viv Hall.



Motu publications in 2018

To see more of our publications, including presentations, please visit <http://motu.nz/find-publications/>.

Motu Working Papers

- 18-13 Alimi, O., Maré DC, Poot J. 2018. "Who partners up? Educational assortative matching and the distribution of income in New Zealand."
- 18-12 Fabling R. 2018. "Entrepreneurial beginnings: Transitions to self-employment and the creation of jobs."
- 18-11 Fleming D, Preston K. 2018. "International agricultural mitigation research and the impacts and value of two SLMACC research projects." (also a Ministry for Primary Industries publication)
- 18-10 Hyslop D, Rea D. 2018. "Do housing allowances increase rents? Evidence from a discrete policy change."
- 18-09 Fleming DA, Noy I, Pástor-Paz J, Owen S. 2018. "Public insurance and climate change (part one): Past trends in weather-related insurance in New Zealand."
- 18-08 Sin I, Dasgupta K, Pacheco G. 2018. "Parenthood and labour market outcomes" (also a Ministry for Women report).
- 18-07 Grimes A, Wesselbaum D. 2018. "Moving towards happiness".
- 18-06 Qasim M, Grimes A. 2018. "Sustainable economic policy and well-being: the relationship between adjusted net savings and subjective well-being".
- 18-05 Clay KC, Bakker R, Brook A-M, Hill DW, Murdie A. 2018. "HRMI civil and political rights metrics: 2018 technical note".
- 18-04 Apatov E, Chappell N, Grimes A. 2018. "Is internet on the right track? The digital divide, path dependence, and the rollout of New Zealand's ultra-fast broadband".
- 18-03 Sin, I, Apatov E, Maré DC. 2018. "How did removing student allowances for postgraduate study affect students' choices?"
- 18-02 Jaffe AB, Chappell N. 2018. "Worker flows, entry, and productivity in New Zealand's construction industry".
- 18-01 Harris R, Le T. 2018. "Absorptive capacity in New Zealand firms: measurement and importance".
- 17-15 Sin, I, Stillman S, Fabling R. 2017. "What drives the gender wage gap? Examining the roles of sorting, productivity differences, and discrimination".
- 17-14 MacCulloch R. 2017. "Political systems, social welfare policies, income security and unemployment".
- 17-13 Fleming, DA, Grimes A, Lebreton L, Maré DC, Nunns P. 2017. "Valuing sunshine".

Motu Notes

- Motu Note #30 Stephenson et al. 2018. "Communities and climate change: vulnerability to rising seas and more frequent flooding".
- Motu Note #29 White et al. 2017. "Climate change and stormwater and wastewater systems".

Journal Articles

- Apatov E, Grimes A. "Impacts of Higher Education Institutions on Local Population and Employment Growth". *International Regional Science Review*. 2018.
- Fabling R, Grimes A, Timar L. "Natural selection: Firm performance following a catastrophic earthquake" in: Borsekova K. & Nijkamp P. (eds.) *Resilience and Urban Disasters*. London: Edward Elgar. 2018.
- Fleming D, Grimes A, Lebreton L, Maré DC, Nunns P. "Valuing Sunshine", *Regional Science and Urban Economics*, 68, 268-276. 2018.
- Gemmell N, Grimes A, Skidmore M. "Do local property taxes affect new building development? Results from a quasi-natural experiment in New Zealand". *Journal of Real Estate Finance and Economics*. 2018.
- Gibson J, Le T. "Improved modelling of spatial cost of living differences in developing countries: A comparison of expert knowledge and traditional price surveys." *Working Papers in Economics 18/08*, University of Waikato. 2018.
- Gørgens T, Hyslop D. "Equivalent representations of discrete-time two-state panel data models" *Economics Letters*, Vol 163 p65-67. 2018
- Greenaway McGrevey R, Grimes A, Holmes M. "Two countries, sixteen cities, five thousand kilometres: How many housing markets?". *Papers in Regional Science*. 2018.
- Jaffe AB, Preston K. "Bibliometric Analysis of New Zealand Research Performance: Measurement and Classification Issues." *MBIE Working Paper*. 2018.
- Jefferson, OA, Jaffe AB, Ashton D, Warren B, Koellhofer D, Dulleck U, Ballagh A, Moe J, DiCuccio M, Ward K, Bilder G, Dolby K, Jefferson RA. "Mapping the global influence of published research on industry and innovation" *Nature Biotechnology*, January 2018.
- Kerr S, Lubowski R, Heilmayr R. "Climate Teams: A New Model for Investor-Host Climate Cooperation" pp.73-76 in Stavins, Robert N., and Robert C. Stowe, eds. *International Cooperation in East Asia to Address Climate Change*. Cambridge, Mass.: Harvard Project on Climate Agreements." 2018.
- Leining C. NZ Chapter in "ICIS Carbon Market Almanac 2017: Global Development and Outlook" 2017.
- Sin I. "The Gravity of Ideas: How Distance Affects Translations" *Econ J*. 2017.
- Smart C, Grimes A, Townsend W. "Ethnic and Economic Determinants of Migrant Location Choice" in: Biagi B, Faggian A, Rajbhandari I, Venhorst V. (eds.) *New Frontiers in Interregional Migration Research, Advances in Spatial Science*, (The Regional Science Series). Springer, Cham. 2018.
- Timar L, Grimes A, Fabling R. "Before a fall: Impacts of earthquake regulation on commercial buildings". *Economics of Disasters and Climate Change*, 2018.
- Timar L, Grimes A, Fabling R. "That sinking feeling: The changing price of urban disaster risk following an earthquake". *International Journal of Disaster Risk Reduction*, 2018.



Relatedness, complexity and local growth

Central government has committed to investing NZ\$3 billion in regional economic development over the next three years. This commitment echoes the European Union’s Cohesion Policy for raising regional wellbeing and avoiding regional disparities. Part of the Cohesion Policy encourages “smart specialisation” in activities that build on local strengths. To economic geographers, smart specialisation is captured by the ideas of relatedness and economic complexity: regions should invest in complex, high-value activities that are related to their existing knowledge base.

We develop a measure of relatedness between economic activities and use this measure to estimate city and activity complexity in New Zealand. We also evaluate the ability of relatedness and complexity to predict subsequent growth in local activity employment. Our analysis uses census employment counts for 50 urban areas (“cities”) and 200 industry-occupation pairs (“activities”) in the years 1981, 1991, 2001 and 2013.

MAPPING RELATEDNESS

Firms engaged in related activities co-locate in order to benefit from labour market pooling, input sharing and knowledge spillovers. This means that, on average, related activities tend to concentrate within the same cities. We capture this mutual concentration using weighted correlations of local employment shares. These correlations are higher between activities that appear together more often than we would expect if activities were distributed randomly according to their shares of national employment. Our approach extends discrete methods based on revealed comparative advantage used in previous studies.

We use our relatedness estimates to create a map of “activity space,” a network in which nodes represent activities and with edges weighted by the relatedness between activity pairs. The heaviest 500 edges in activity space are shown below, laid out so that related activities are close together and with nodes coloured by occupation. Our network map reveals a densely connected cluster of activities associated with low-skill occupations, reflecting strong co-location patterns. Activities associated with high-skill occupations are less tightly clustered.

ESTIMATING COMPLEXITY

Complex activities combine diverse sets of complementary knowledge and skills. As a result, complex activities are valuable but hard to establish; they are not spatially transferable and tend to concentrate in large urban areas that facilitate deep divisions of labour. We estimate activity complexity using numerical methods that capture the extent to which activities rely on specialized combinations of knowledge.

The most complex activities in our sample are associated with high-skill occupations in the professional service, telecommunications and finance industries. By contrast, the least complex activities are associated with low-skill occupations in the retail and construction industries.

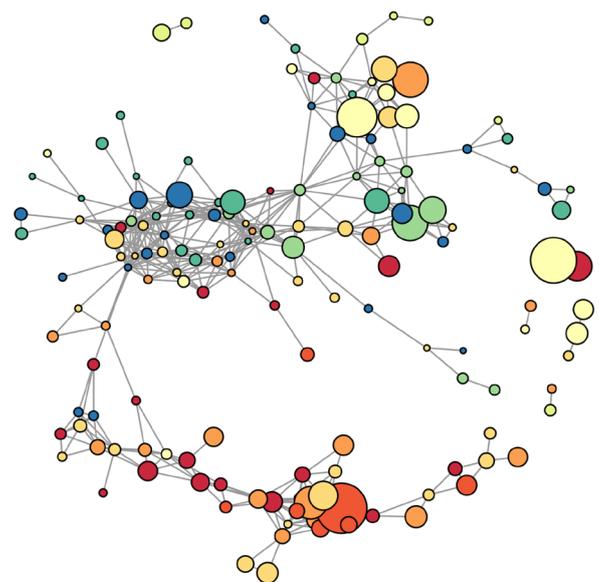
PREDICTING GROWTH

More complex activities experienced faster growth in our sample. On average, a one standard deviation rise in activity complexity is associated with a one percentage point increase in employment growth per year. This effect falls to 0.89 percentage points when we control for activities’ average relatedness with other activities in each city.

Our preferred model specification, which controls for time-varying city and activity factors, explains 72% of the variation in local activity growth rates. On average and across our entire sample, relatedness and complexity have a positive joint effect on local employment growth. However, this effect is both statistically and economically insignificant. Moreover, higher relatedness and higher complexity together predict declines in activities that are locally under-represented relative to their share of national employment. These results indicate that smart specialisation does not explain employment dynamics in our data.

CONCLUSIONS

Complex activities in our sample experienced faster growth between 1981 and 2013—especially in cities dense with such activities—but this growth was not significantly stronger when related activities were more prevalent in the city. The benefits of relatedness, which underlie a “smart specialisation” approach to local economic development, were not evident in New Zealand during our sample period. It remains an open question whether policies to strengthen local relatedness and complexity have the potential to deliver such benefits in the future.



- Legislators
- Professionals
- Technicians and associates
- Clerks
- Service and sales
- Agriculture and fishing
- Trades
- Plant and machine operators
- Elementary and residual

Acknowledgements: This work is funded through Te Pūnaha Matatini, and the Building Better Homes, Towns and Cities National Science Challenge.





Motu's Research and the "Wellbeing Budget"

In 2019, New Zealand will have its first explicit Wellbeing Budget. That Budget will build on Treasury's work to develop a comprehensive Living Standards Framework for policy-making.

Many aspects of Motu's research can assist in understanding what might be important for government to consider in order to enhance wellbeing. In particular, a series of studies funded through a Royal Society of New Zealand Marsden Fund grant provide information on what people see as being important for their own wellbeing.

While there are many interpretations, the Oxford English Dictionary provides "welfare" as a one word definition of "well-being". Our history has seen many welfare-oriented budgets from governments of all stripes. Notable amongst these, of course, were the major welfare programmes introduced by the Liberal government of the 1890s and the Labour government of the 1930s. So how might a "wellbeing" budget differentiate itself from one of these "welfare" budgets?

Globally, researchers use measures of subjective wellbeing as indicators of wellbeing across and within nations. These measures are often based on a question that reads something like: "How do you feel about your life as a whole right now?"¹ The worldwide Gallup Poll asks a similar question across approximately 150 countries. In the latest poll – topped by Norway – New Zealand ranks 8th in the world for average life satisfaction. We rate slightly above Sweden (9th) and Australia (10th) and well above USA and UK (15th and 18th respectively). New Zealand's high wellbeing ranking compares with our rank of 34th according to Gross National Income per person.²

So what factors do New Zealanders value? Our research³ shows that factors which are associated with high subjective wellbeing include: having good health – especially good mental health; being prosperous; and not being unemployed. As in many countries, adults who are under 30 years of age and adults over 60 years of age are more satisfied with life than middle-aged people. Women also tend to be a little happier than men. Other research shows that having good social connections (e.g. someone to rely on in an emergency) is extremely important for people's wellbeing.⁴

Prosperity is important to most people; even workers in the social services strike for more money! However, our research shows that personal income is not the best indicator of prosperity. It turns out that people's subjective wellbeing is more closely related to what they can consume rather than what they earn. For instance, older people may have low incomes, but those who have saved over their working lives may still be able to afford an affluent lifestyle.

This observation indicates that Budget policies aimed at boosting wellbeing should not necessarily be directed at low income individuals per se; rather attention is better directed to those who cannot afford essentials. An example of expenditures that might be redirected in a wellbeing budget are winter bonus payments to the over-65s which go to some people in need, but which also go to people who are already living very comfortably.

The observation that consumption expenditures are a better indicator of wellbeing than incomes can also be used to compare New Zealanders' material wellbeing relative to that of people in other countries. Another Motu study⁵ used OECD PISA survey data for households' durable goods possessions (e.g. for books, artworks, computers, dishwashers, cars and bedrooms). Specifically, the households had to have a 15 year old in that household; hence comparisons are for families at a similar stage of the life cycle.

On this measure, New Zealand families ranked 3rd in the world in terms of average household possessions (behind USA and Canada and just ahead of Australia). Thus while our incomes are not world-beating, on average we can afford plenty of stuff!

However the same research showed a less rosy picture in terms of the distribution of resources across families. New Zealand ranked as a more unequal society than most developed countries. We were on a par with Canada, USA and the UK and were much more unequal than many Western European countries and Australia.

Work within Superu⁶ shows that certain types of household are much more deprived than others. In particular, sole parent families with children are particularly deprived. Recent work within Treasury⁷ identifies other groups that face particular hardships.

Based on this and other research, one can anticipate that a Wellbeing Budget might identify specific target groups (e.g. sole parent families) and specific target policy areas (e.g. mental health) that require the greatest attention to lift the wellbeing of the most deprived.

One final observation is in order. There is now significant wellbeing-related research available on which to base policy. As always, however, well-designed evaluations of policy interventions will be required to ensure that the money that is spent has a real payoff for those most in need.

"a Wellbeing Budget might identify specific target groups (e.g. sole parent families) and specific target policy areas (e.g. mental health) that require the greatest attention to lift the well-being of the most deprived"

1. This wording was used in the New Zealand General Social Survey in 2012, which was the source of the data used in Carver and Grimes (2016), referenced below.

2. Source: UNDP (using purchasing power parity figures).

3. Carver T. & A. Grimes. 2016. "Income or Consumption: Which Better Predicts Subjective Wellbeing?" Motu Working Paper 16-12.

4. Brown D., J. Woolf & C. Smith. 2012. "An empirical investigation into the determinants of life satisfaction in New Zealand", *New Zealand Economic Papers*, 46(3), 239-251.

5. Grimes A. & S. Hyland. 2015. "A New Cross-Country Measure of Material Wellbeing and Inequality: Methodology, Construction and Results", Motu Working Paper 15-09.

6. Superu. 2017. *Families and Whānau Status Report*, Wellington: Social Policy Evaluation and Research Unit.

7. Unofficial 'work in progress' from within Treasury on *Multidimensional Wellbeing in NZ* was presented to the Third International Conference on Wellbeing and Public Policy, Wellington, September 2018.