Economic Impacts of COVID-19 on the Taranaki Economy – Early Estimates

for Venture Taranaki & New Plymouth District Council

April 2020

Infometrics
Economics put simply

Authorship

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Executive Summary

This report provides an overview of the anticipated economic impacts of the COVID-19 pandemic on the Taranaki Region.

COVID-19 presents the greatest economic shock in living memory. This contraction is set to be at least four times larger than anything seen in New Zealand since the Great Depression.

All regions and districts will be hard hit by the pandemic. Taranaki sits in the middle of the regional league table. The Taranaki economy is heavily reliant on the energy sector which faces a strong drop in demand from all its major users including electricity generation, food processing, the chemical industry, smaller users in the commercial sector (shops and restaurants) and in the household sector. Demand for transport fuels has fallen everywhere.

But there are factors that will cushion the blow:

- Taranaki has a large primary sector and primary exports are holding up
- Food consumption will continue through the recession and Taranaki has a sizeable food manufacturing sector
- The region is not highly exposed to international tourism and education, both of which will be knocked hardest by the pandemic.

The Level 4 lockdown has brought much of the Taranaki economy to a standstill. Consumer spending and heavy traffic has dropped to nearly half the level at the same time last year, but by lower proportions than in the national economy.

About 56% of the Taranaki workforce were able to work during Level 4 (53% in the national economy). This working rate will rise to 77% during Level 3 (74% nationally).

Taranaki's GDP is forecast to contract by 8.5% over the year to March 2021, compared with an 8.0% contraction in the national economy. The energy sector will contribute more than a third of the expected decline.

We expect more than 5,500 jobs to be lost in Taranaki by March 2021, which is over 9% of the workforce. Job losses will push the unemployment rate to 10.1% from its current rate of 5.3%. The bulk of job losses are forecast to be in accommodation and food services (-1,072 jobs), retail and wholesale trade, (-890), transport, postal and warehousing (-795) and construction (-585).

The industries that will experience the largest job losses generally employ lower skilled workers and it follows that lower skilled jobs will decline fastest. We estimate that nearly half of all job losses are in lower skilled occupations.

Some occupations require relatively generic skills, which can allow workers in these occupations to move between industries. Opportunities for these workers may arise in some industries in Taranaki who face reduced supply of international backpackers and other seasonal workers. We outline the industries which are likely to shed staff with generic skills.

The Māori unemployment rate in Taranaki is usually more than double the overall rate. This gap will stay wide as Māori are highly exposed to industries that will experience large job losses in Taranaki.

We estimate that a nearly $3.5b was earned through wages and salaries in Taranaki in the year to March 2020 and this will decline by $312m in the year to March 2021. Approximately 84% of household income in Taranaki is earned as wages and salaries.

We expect residential construction activity in Taranaki to fall to levels last seen in the early 2000s. Soaring unemployment, a sudden termination of immigration, and falling house prices are set to slow new residential developments in their tracks.

Prospects for non-residential construction are more positive. Our forecasts include the planned $300m wing for the Taranaki Base Hospital. This project will be lift construction activity to historically high levels and is vital for the construction sector and the recovery of the Taranaki economy. Without this project construction activity could drop to levels which are very low by historical standards.

Summary of key indicators

Indicator	Taranaki Region	New Zealand
Change in consumer spending (week ending 12 April 2020 compared to same period 2019)	-49.2%	-55.9%
Change in heavy traffic (week ending 9 April 2020 compared to 1 February 2020)	-51.4%	-59.7%
% working at Level 4	55.6%	52.8%
% working at Level 3	77.3%	74.2%
GDP % change, year to March 2021	-8.5%	-8%
Job losses, year to March 2021	-5,586	-250,522
Employment % change, year to March 2021	-9.5%	-9.8%
Unemployment rate, March 2021	10.1%	9%
Loss in total earnings, year to March 2021 ($m)	$-312.96	$-14,197.08
Residential construction % change, year to March 2021	-19.3%	-18.8%
Non-residential construction % change, year to March 2021	-19.1%	-18.3%

Introduction

This report provides an overview of the anticipated economic impacts of the COVID-19 pandemic for the Taranaki Region.

It includes an assessment of the headline impacts of the COVID-19 lockdown as of April 2020, forecast changes to economic activity, employment and other key indicators over the year to March 2021, information on potential mobility of labour between different industries, and the outlook for construction activity in the region.

The forecast analysis presented in this report draws on a suite of economic models maintained by Infometrics. Models are only as good as the assumptions we put into them and we have clearly outlined our key assumptions.

This report is accompanied by a spreadsheet set which contains all the data used to prepare this report plus additional data. It is also accompanied by a report called *Additional insights on the economic impacts of the COVID-19 pandemic* which provides information which is too detailed for this main report. The supporting document contains an expanded explanation of how COVID-19 is likely to impact the New Zealand economy and additional detail of how the pandemic will impact on each industry.

The greatest economic shock in living memory

COVID-19 presents the greatest economic shock in living memory, and although the full extent of the shock is still to play out, it is clear is that the economy will be irrevocably changed by this pandemic. The speed with which the economic outlook changed during March far exceeded anything experienced during the Global Financial Crisis (GFC) of 2008/09.

Infometrics is currently forecasting a 13% contraction in economic activity in the New Zealand economy between the December 2019 and June 2020 quarters, with most of the decline occurring in the June quarter due to the lockdown. This contraction is set to be at least four times larger than anything seen before, so there is understandably considerable scope for error in this estimate. Over a slightly longer time horizon, our forecast is for an 8% contraction in economic activity over the year to March 2021.

By March 2022, we expect quarterly GDP to be 6.6% below its December 2019 level. We estimate the unemployment rate will peak at 9.5% in the September 2021 quarter, and to remain above 8% until the December 2023 quarter. In addition, underemployment is set to rise, while some of the unemployed will drop out of the labour force or seek out education opportunities in order to reskill. These factors will contribute to a decline in the labour participation rate, which we predict could fall to its lowest level since 2001.

Modelling of the impacts of COVID-19 are based on key assumptions

We have made the following assumptions when modelling the effects of the COVID-19 pandemic, the economic downturn, and the government's policy responses on the New Zealand economy.

- Lockdown is 4½ weeks at Level 4 and 2 weeks at Level 3 - we have based our industry employment and output modelling on Level 4 being in place for 4½ weeks and Level 3 being in place for two weeks.
- Economic activity is constrained across the entire economy - we estimate that approximately 65% of economic activity can take place under Level 4. This estimate includes people that can work from home and those people working in essential services. Under Level 3, our estimate of potential economic activity taking place rises to 82%.
- Global demand for food products will hold up but non-food exports will take a hit – people still need to eat during a recession, which will limit any reduction in our food exports, we have allowed for a 16% contraction in non-food manufacturing export volumes over the coming year, and a 9.5% reduction in international demand for unprocessed forestry exports such as logs.
- Foreign tourism tanks – we have estimated a 91% reduction in foreign tourist spending in New Zealand over the coming year, and a similarly sized reduction in New Zealand tourists spending money overseas.
- Domestic tourism spending will drop – despite more New Zealanders choosing to have domestic holidays rather than travel overseas, we estimate a 21% decline in domestic tourism spending from the previous year.
- International education revenue halves – we estimate the number of international students at schools this year to be 79% of normal levels, and predict a 49% reduction in international education revenue during the year to March 2021.
- Domestic education demand will increase – we have allowed for a lift in total demand for tertiary training from domestic students over the coming year of 8.3%, similar to what we saw following the GFC.
- The housing market takes a hit – our assumptions include an 11% drop in average house prices between mid-2020 and the end of 2021.
- Construction is also hit hard – the housing market downturn will drag down the rate of residential construction by nearly 20%, while non-residential construction activity will decrease by a similar magnitude. In contrast, prospects for civil construction are positive outside Level 4 lockdown conditions.
- Government comes to the party –our modelling includes a $10b wage subsidy scheme and $2.5b through a one-off increase in social welfare benefits of $25 per week.

A full description of the Infometrics modelling assumptions is provided in Appendix I.

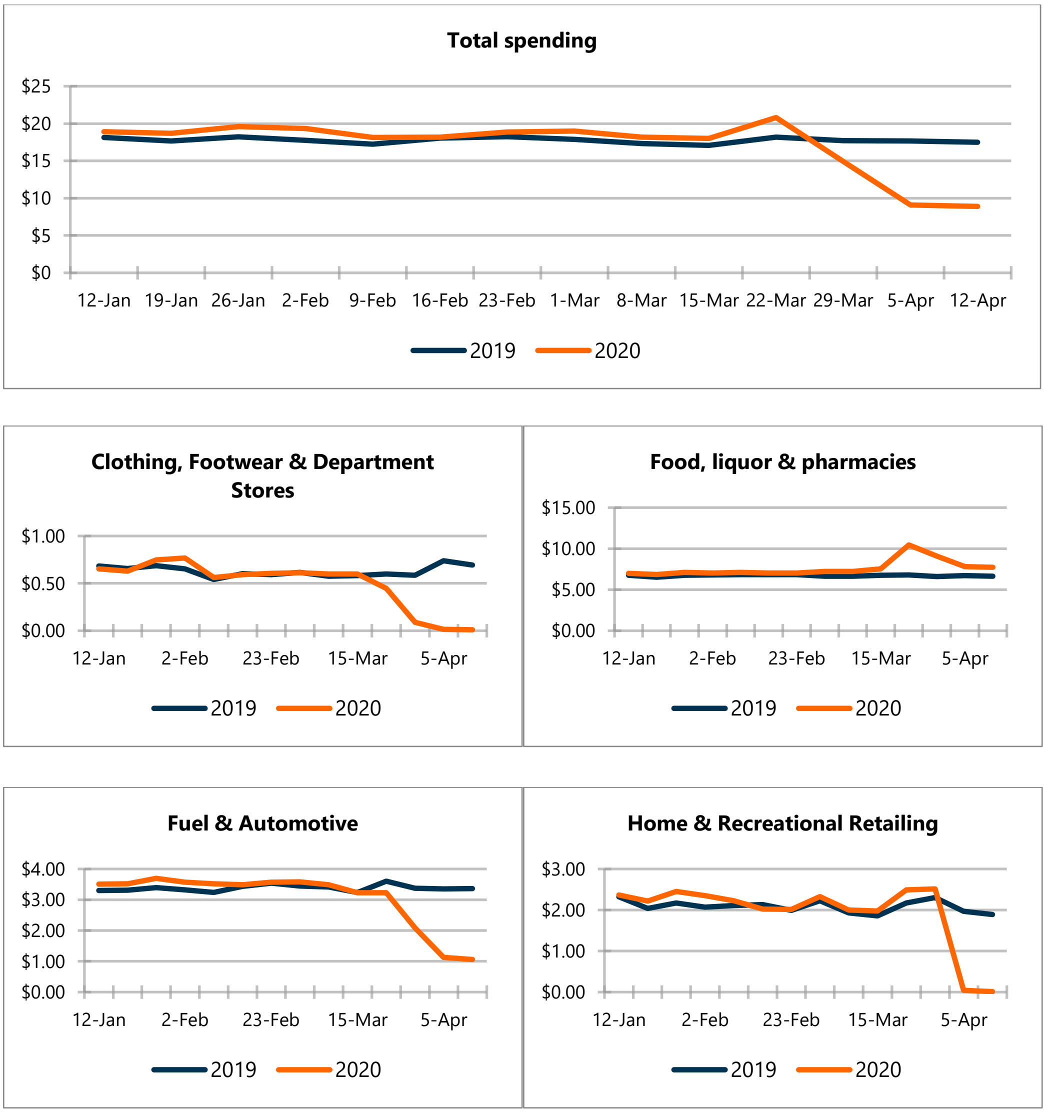
The Level 4 lockdown has knocked the Taranaki economy

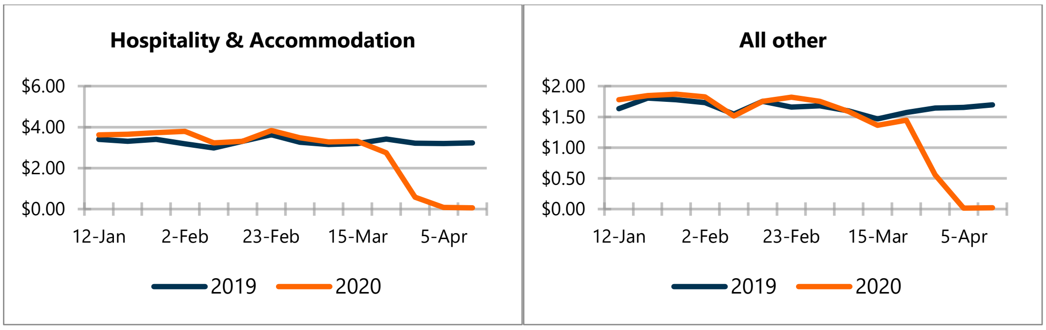
Like the rest of New Zealand, much of Taranaki's economy has been closed by the Level 4 lockdown.

Consumer spending has fallen off a cliff

Consumer spending in Taranaki increased in the week leading up to the Level 4 lockdown on 25 March 2020, and then declined rapidly dropping to almost half the level at the same period in 2019. Spending in the week ending 12 April was 49% lower than in the same week in 2019. Nationally spending declined by 56%. The only category in which spending has held up and even increased compared with 2019 was food, liquor and pharmacy.

Consumer spending through Paymark network ($m)

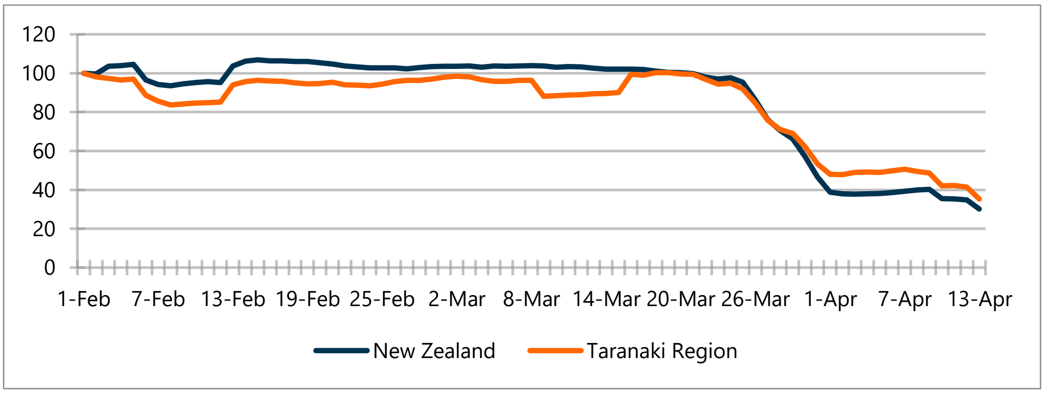




Traffic flows have dwindled

According to data from NZTA, heavy traffic flows in Taranaki peaked ahead of the Level 4 lockdown, then dropped sharply as non-essential businesses closed, and goods movements softened. Traffic flows have fallen by a smaller proportion than in the national economy suggesting that economic activity is holding up better than other parts of the country. Heavy traffic flows in Taranaki decreased by 51% in the week ending 9 April 2020 compared with 1 February 2020. The decline was 60% in the national economy.

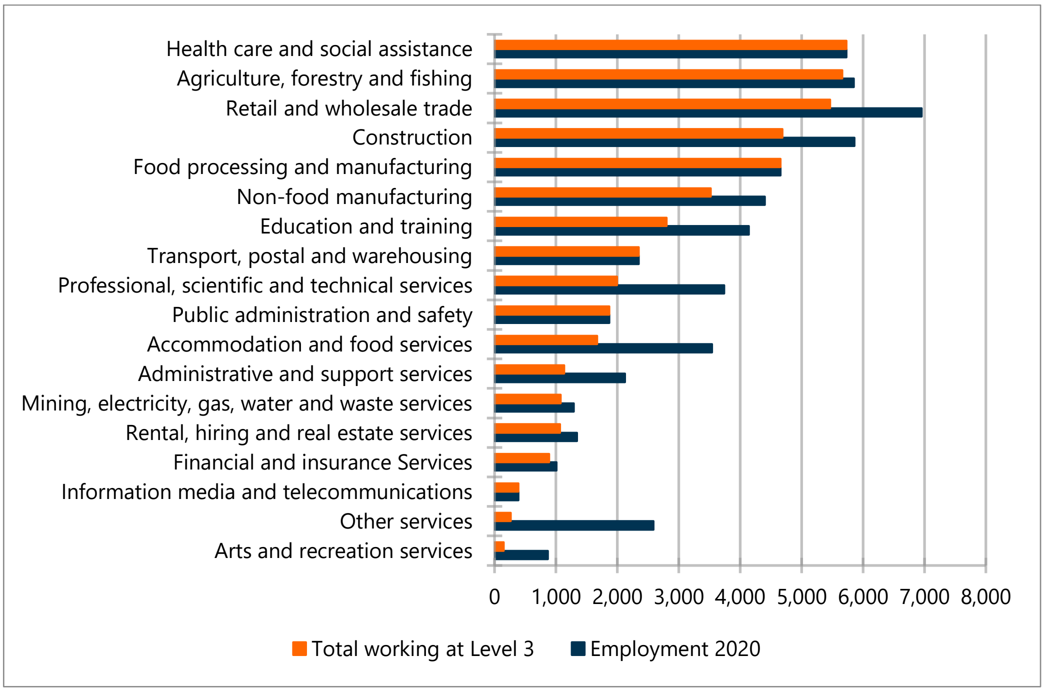
Heavy traffic flows, Index, 1 Feb 2020 = 100



56% are working at Level 4 which will rise to 78% at Level 3

We estimate that during the Level 4 of the lockdown, approximately 56% of the total Taranaki workforce can operate, either by working from home, or being employed in essential services. In the national economy 53% could work. At Level 3, the rate will rise to 77% compared with 74% in the national economy.

Taranaki Workforce operating at Alert Level 3



Taranaki sits in the middle of the pack

All districts and regions in New Zealand will be hit hard by the pandemic. The worst hit will be areas that are heavily exposed to international tourism including Queenstown, Mackenzie, Westland, and Kaikōura. By contrast the least affected areas are those whose economies are dominated by the primary sector and with large food manufacturing sectors.

Taranaki sits between these two groups. It has a relatively small international tourism sector, a large primary and food producing sector, but it is dominated by the energy sector which will be constrained by a decline in demand for energy. The combined effect of these forces puts Taranaki in the middle of the region pack.

Drop in demand for oil and gas will drag down the Taranaki economy

The Taranaki economy is heavily reliant on the energy sector. We expect output in the sector to decline by 13% which reflects decreased demand from all the major users of gas including electricity generation, food processing, the chemical industry, smaller users in the commercial sector (shops and restaurants) and in the household sector. Demand for transport fuels has fallen everywhere.

A few factors will lessen the impact of the pandemic on Taranaki's economy:

Primary exports are holding up

Despite the widespread turmoil in international markets, New Zealand's exports of food products are holding up and for some commodities even growing slightly. Agriculture, forestry and fishing is Taranaki's second largest industry (after the mining, electricity, gas water and waste services industry) and accounts for more than 15% of GDP. Continued primary export strength is likely to support the region's economic recovery.

Food production will continue

People need to continue eating during a recession which means the food manufacturing sector will not be as hard hit as the rest of the economy. Taranaki has a large food manufacturing sector, including meat and dairy processing, which accounts for nearly 5% of GDP. The strength of these sectors which will support the Taranaki economy though tough economic times.

Taranaki is not highly exposed to international tourism

Only 20% of tourist expenditure in Taranaki is from foreign tourists in a sector that contributes only 2.5% towards GDP. Domestic tourism will hold up much better than foreign tourism; we estimate that domestic tourism spending in the year to March 2021 will drop by 21% compared with a 91% drop in foreign tourism spending.

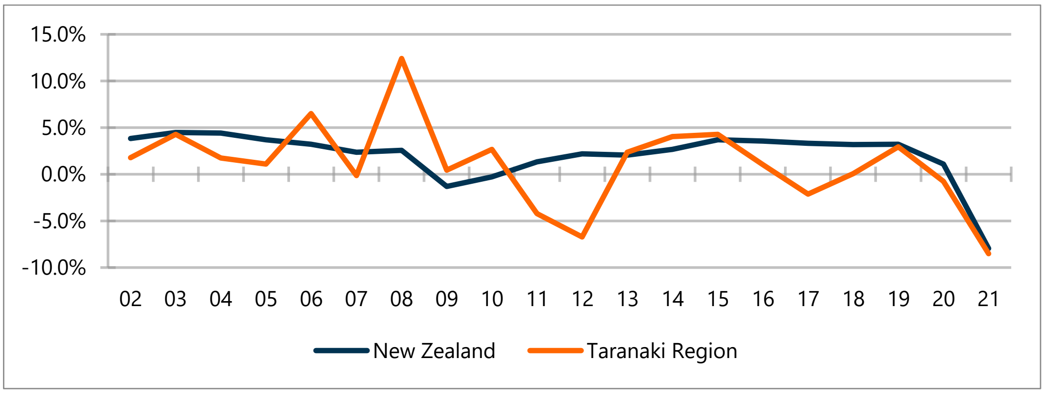
International education is a minor sector in Taranaki

New Zealand had more than 110,000 international students in 2019 but fewer than 1,000 in Taranaki. The big loss of international students due to the border closure will hit areas with large international student numbers hard.

Taranaki's economy will contract by 8.5%

Taranaki's GDP is forecast to contract by 8.5% over the year to March 2021, compared with 8.0% in the national economy. The expected contraction in Taranaki is significantly deeper than the energy-sector induced recession of 2012.

Annual GDP change, 2002-2021



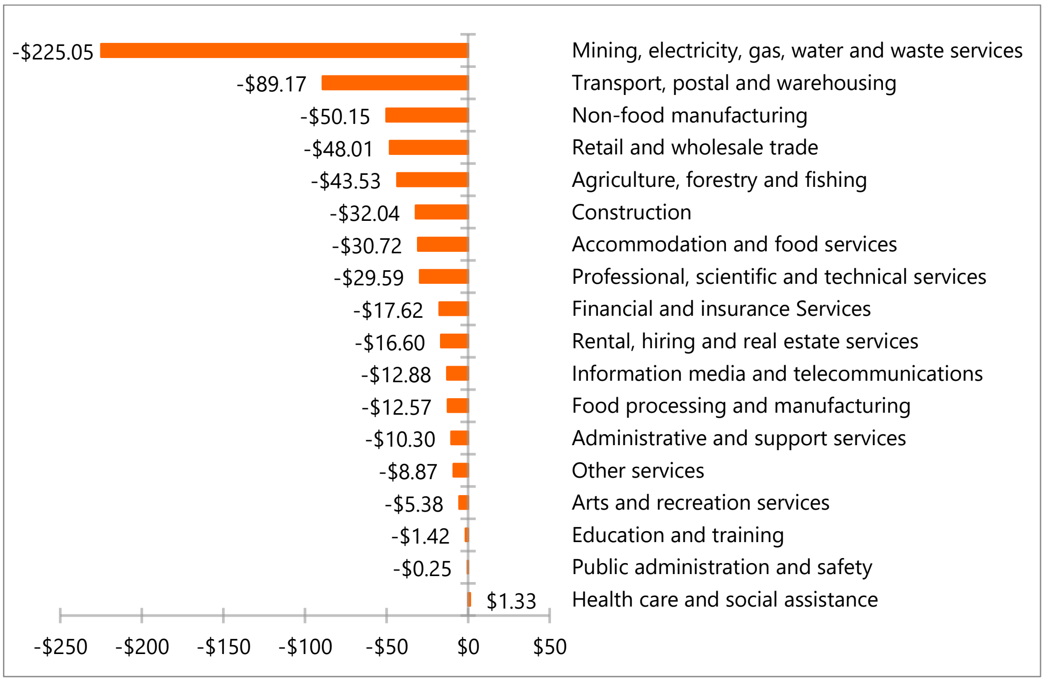
The energy sector will take the biggest hit

The energy sector contributes about a quarter of Taranaki's economic output. Mining, electricity, gas, water and waste services will contribute more than a third of the overall decline in GDP in Taranaki over the year to March 2021. GDP in these industries is expected to decline by $225m or -13%.

Amongst the major users of gas are electricity generation, food processing (especially dairy) and the chemical industry (fertiliser, hydrogen peroxide, and methanol). All will be negatively affected by COVID-19, along with many smaller users in the commercial sector (shops and restaurants for example) and in the household sector. Two large users of gas, Methanex and the dairy processing plant at Whareroa are themselves in Taranaki. Oil is primarily exported although some is an input into the Marsden Point oil refinery.

With current restrictions on movement throughout the world, demand for petrol, diesel and other transport fuels has fallen everywhere. This has accelerated the decline in the oil price that was already happening before the COVID-19 outbreak, driven by slowing world growth, gaming behaviour by oil producers and, most fundamentally of all, a long term trend decline in real prices due to the decarbonisation of transport fuels. The timing is such that Covid-19 may hammer expectations and investor sentiment even though its pure effect on prices is relatively minor with regard to both duration and longer-term oil supply/demand fundamentals.

Change in GDP by broad industry, 2020-2021 ($million)



Other major contributors to the decline are transport, postal and warehousing ($89m, -31%), non-food manufacturing (-$50m and retail and wholesale trade ($52m, -9.3%).

A discussion of some of the other broad trends affecting industries is provided below.

- Transport, postal, and warehousing has been significantly affected by the pandemic. As is the case for accommodation and food services, these effects will continue long after the lockdown ends. Other parts of the transport and logistics industry have been weakened by factors such as reduced commuter travel and cutbacks in distribution and freight requirements caused by the lockdown. Some of these effects will start to reverse out with a pick-up in online spending outside Level 4, but this positive influence on activity is likely to be outweighed by the reduction in overall spending caused by the weaker labour market and incomes.

- Retail and wholesale trade has experienced a significant drop in demand under Level 4, and restrictions will remain in place under Level 3 as well. These effects are not being felt equally, with supermarkets enjoying periods of higher-than-usual demand. Other businesses that can sell online will be able to operate under Level 3, although we do not expect spending patterns during this period to be normal. The declines in tourism activity and other discretionary spending will also be felt disproportionately by retailers selling more luxury or higher-end products.

- Non-food manufacturing tends to be less labour-intensive than many other industries, but the downturn in the global economy will have a significant negative effect on demand for the industry. Manufactured exports are expected to be squeezed by weak demand conditions across much of Europe, North America, and Australia. The Global Financial Crisis also demonstrated the strong links between parts of non-food manufacturing and building work. Consequently, the forecast downturn in construction activity will also contribute to a decline in employment and output in this industry.

- Professional, scientific, and technical services is the seventh-largest industry in the Taranaki economy. Despite the industry being less directly affected by COVID-19 than many other industries, the forecast drop in output is still large. Cost-cutting by firms and a reduction in business numbers across the economy will negatively influence demand for services within this industry across the board. Areas that are likely to be most heavily affected include those subindustries that are closely linked with construction activity.

- Accommodation and food services will be arguably the most heavily affected part of the economy by the COVID-19 pandemic and its aftermath. The disappearance of international tourism and declines in domestic tourism and other discretionary spending are key factors in the industry's contraction. Activity will continue to be severely constrained under COVID Alert Level 3, while domestic travel will also remain restricted under Alert Level 2.

- Construction activity was close to peaking even before the COVID-19 pandemic occurred. Rising unemployment, falling house prices, slower population growth, and tighter bank lending conditions will all weigh on activity over the next 1-2 years across both the residential and non-residential subindustries. Prospects for infrastructure look more promising given the government's desire to use this channel to try and stimulate the economy's recovery. We also note that strong growth in the population and building stock over recent years has increased the baseline level of maintenance work that needs to be done, mitigating the downturn for those parts of the industry that tend to be less cyclical.

- Financial and insurance services will be squeezed by the downturn in economic activity. Lockdown conditions are likely to have increased the amount of work being done electronically across parts of this industry, and this shift could potentially hasten the trend towards reduced job numbers for some occupations. More difficult business and financial market conditions could also negatively affect the viability of some firms in this industry. However, we note that the overall strength and robustness of the financial system is much better than it was between 2006 and 2010 when the industry grappled with the finance company collapses and the Global Financial Crisis.

- Information media and telecommunications activity will also come under pressure, despite the short-term boost to selected businesses from the increase in remote working that has taken place. Traditional media such as newspapers and magazines were already under significant pressure prior to COVID-19. Substantial drops in advertising revenue have exacerbated this situation and will lead to job losses, despite government support. Significant job losses in areas such as libraries, movie theatres, and some parts of telecommunications are also possible.

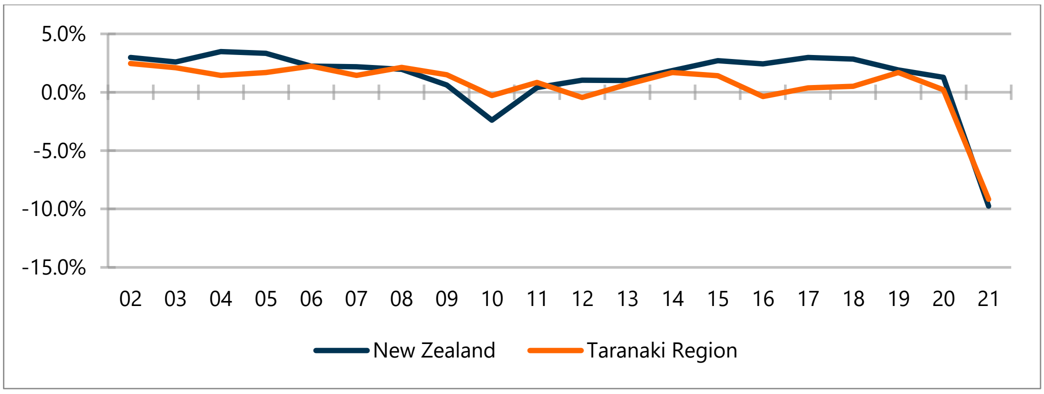
- Administrative and support services are expected to mirror broader economic trends in business activity, with cost cutting, business failures, and the weak labour market negatively affecting this industry. Given the downturn in tourism, travel agents will be by far the most heavily hit, with modest declines in employment across other parts of the industry.

- Arts and recreation services are suffering the twin effects of a reduction in discretionary spending and restraints on what services and products can actually be offered to consumers. Performing arts, professional and community sports, horse racing, casinos, and other entertainment and events will continue to be constrained at Alert Levels 2 and 3, with restrictions on gathering numbers at both indoor and outdoor events. Ongoing border restrictions are also set to disrupt the ability of promoters to run events where they are reliant on entertainers or sportspeople coming into New Zealand from overseas.

More than 5,500 jobs will be lost

Employment in Taranaki is expected to decline from about 58,700 in the year to March 2020 to approximately 53,100 in year to March 2021, a decline of 9.5% or 5,500 jobs. This compares to an economy-wide decline in employment of 9.8%.

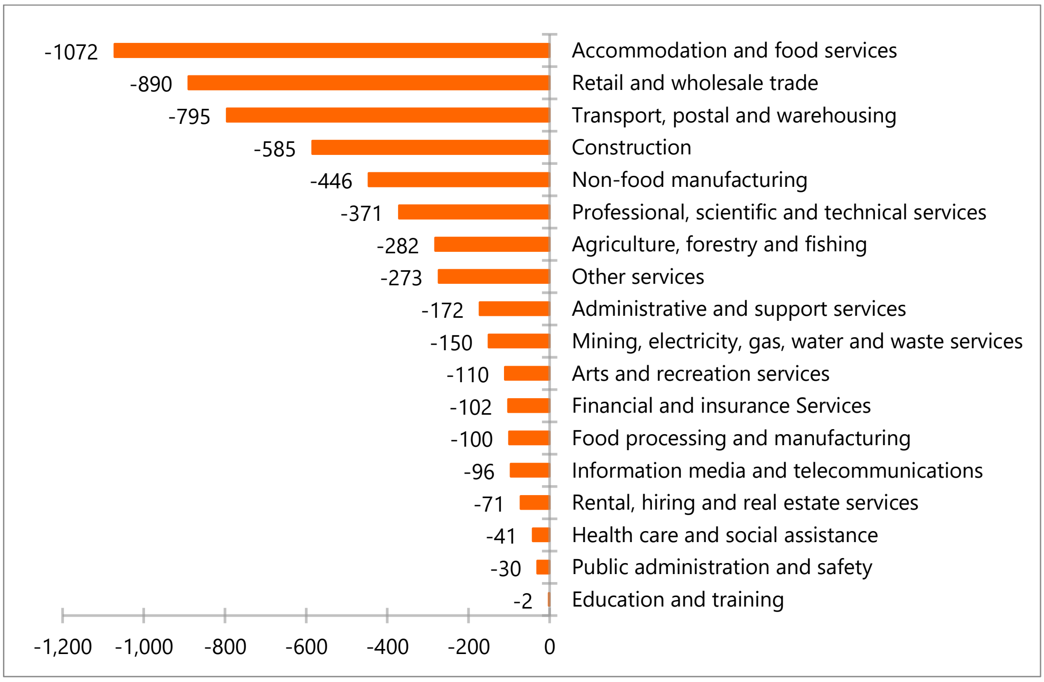
Employment annual % change, 2002-2021



Industries showing the largest job losses are different from the industries showing the largest declines in GDP. Although the mining, electricity and gas sector will show the largest decline in GDP it is highly capital intensive so the number of direct jobs expected to be lost is 150.

The bulk of job losses are forecast to be in accommodation and food services (-1,072 jobs), retail and wholesale trade, (-890), transport, postal and warehousing (-795) and construction (-585).

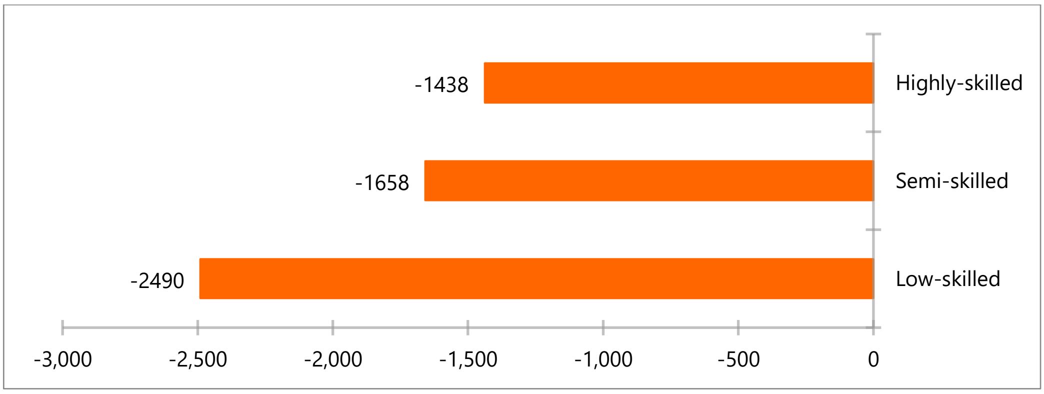
Employment change by broad industry, 2020-2021



Lower skilled jobs will be hardest hit

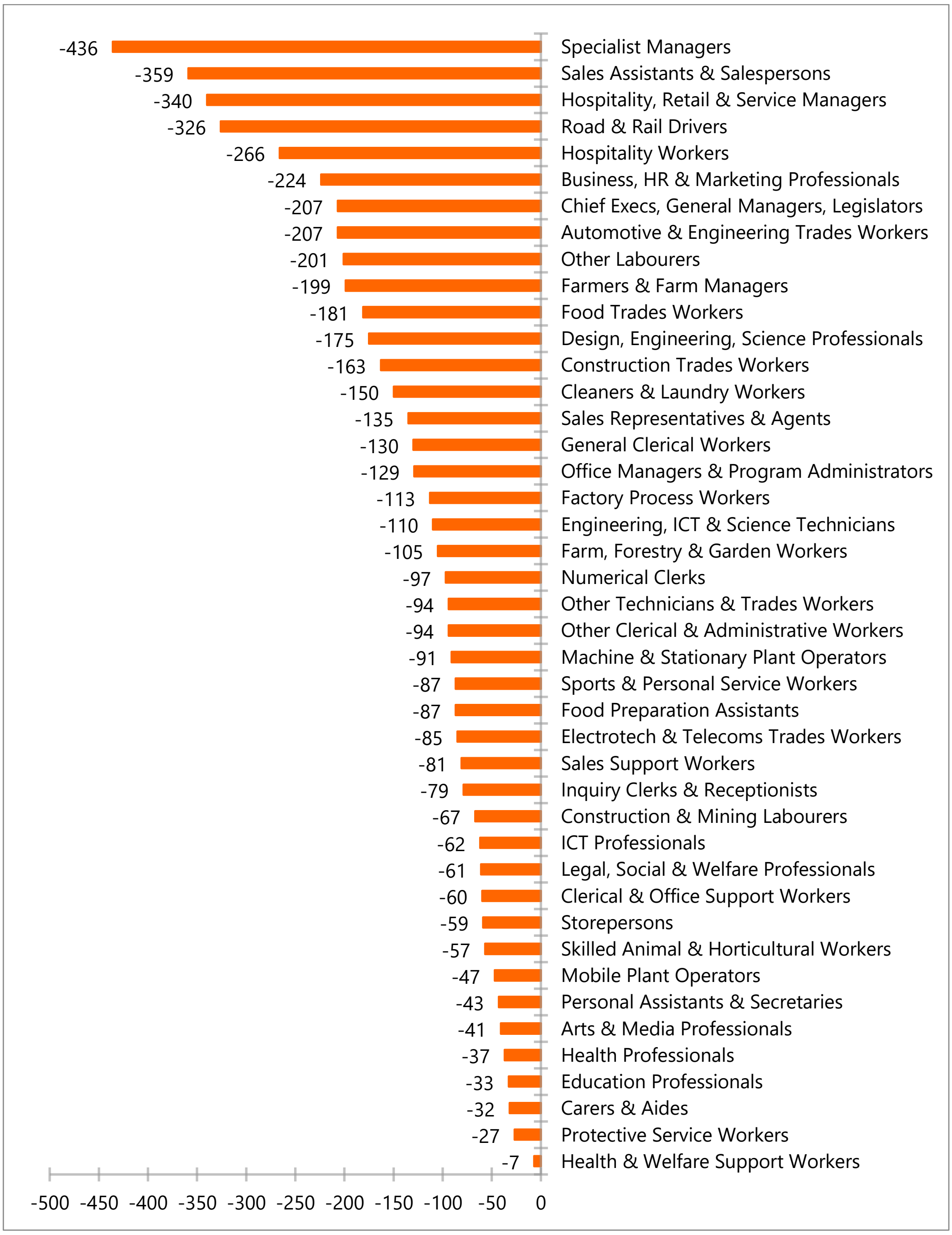
The industries that will experience the largest job losses generally employ lower skilled workers and it follows that lower skilled jobs will decline fastest. We estimate that nearly half (-2,490) of all job losses are low skilled.

Employment change by skill level, 2020-2021



A detailed breakdown of the types of occupations that are likely to experience the largest jobs losses is shown in the chart below. Largest losses are expected for specialist managers (-436), sales assistants and sales persons (-359), hospitality, retail and service managers (-340) and road and rail drivers (-326).

Employment change by occupation, ANZSCO Level 2, 2020-2021

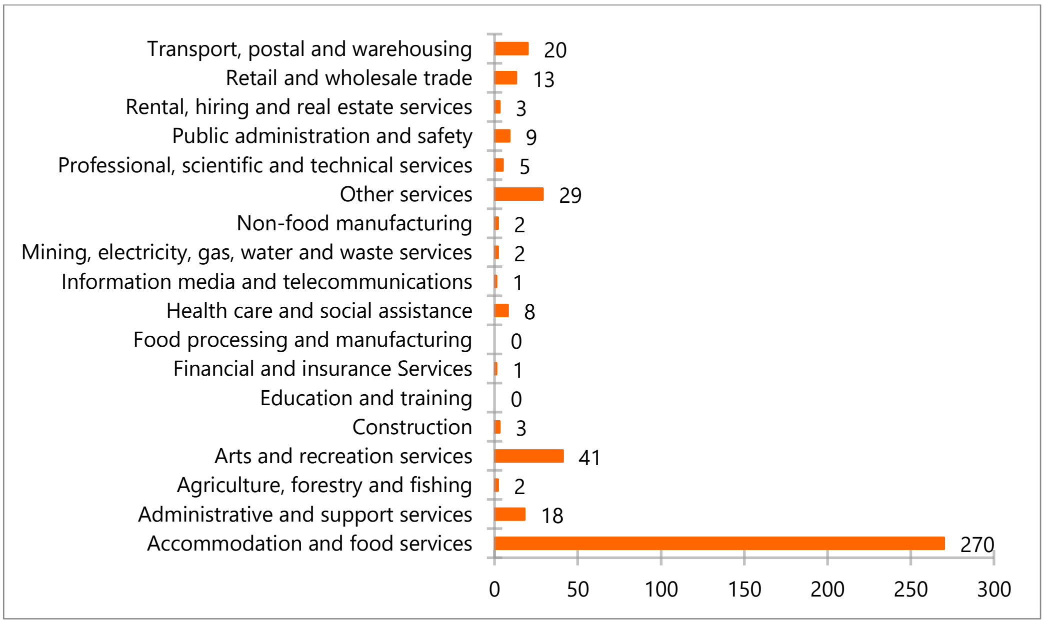


Some jobseekers can move between industries

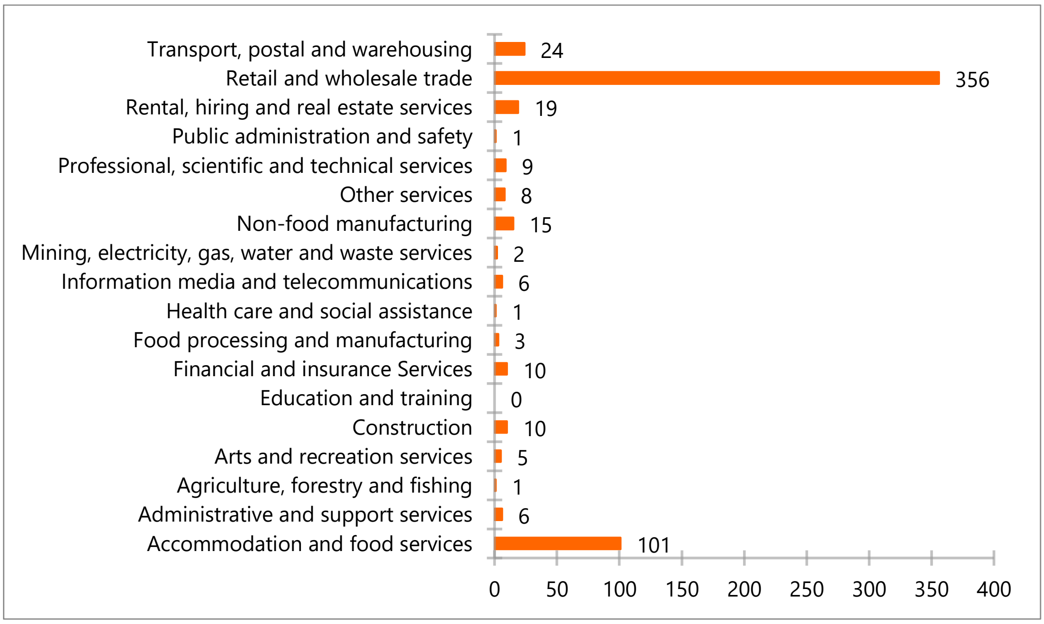
Certain occupations such as clerical and administration workers, machine operators and drivers, and labourers require relatively generic skills, which can allow workers in these occupations to move between industries. Opportunities for these workers may arise in some industries in Taranaki who face reduced supply of international backpackers and other overseas seasonal workers.

Here, we analyse job losses in these occupation groups across the region's industries to identify potential labour sources for employers who might have job vacancies. For example, clerical and administrative workers who have lost their jobs in the transport, postal and warehousing, or retail and wholesale trade industries, might find opportunities in public administration, utilities or education and training where fewer job losses are expected. In coming years, we will be able to identify opportunities for jobseeker mobility into industries that are starting to recover.

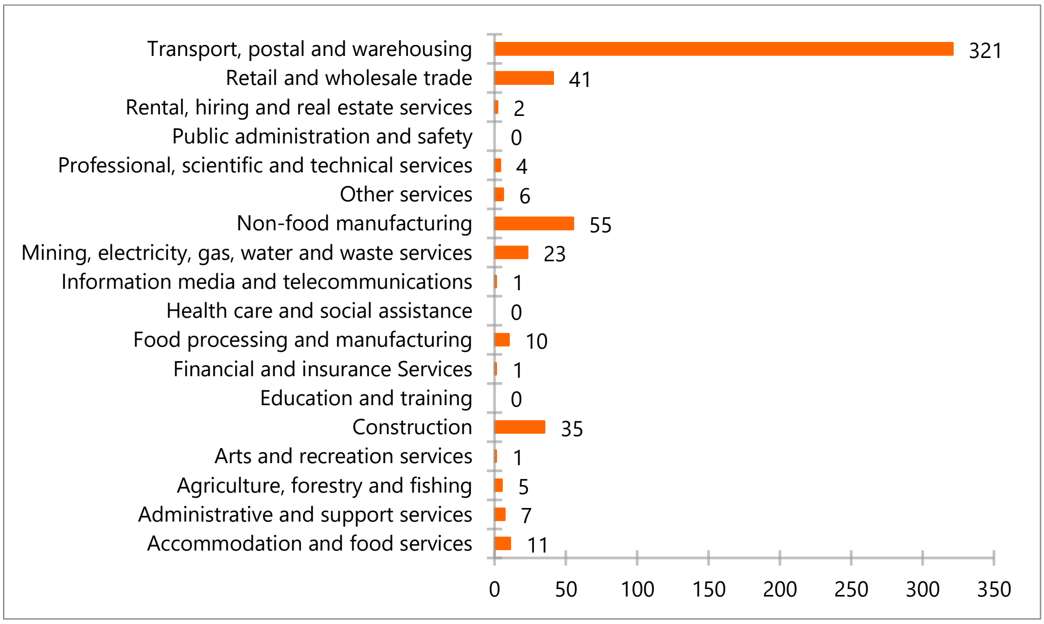
Job losses in 'Community and personal service worker' occupations by broad industry, 2020-2021



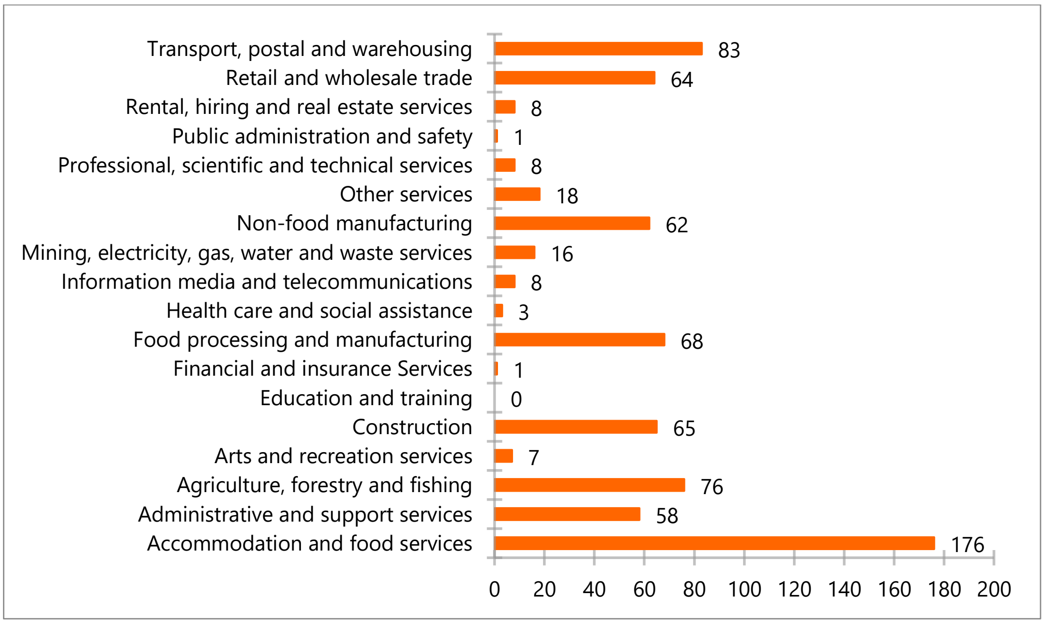
Job losses in 'Sales worker' occupations by broad industry, 2020-2021



Job losses in 'Machine operator and driver' occupations by broad industry, 2020-2021



Job losses in 'Labourer' occupations by broad industry, 2020-2021

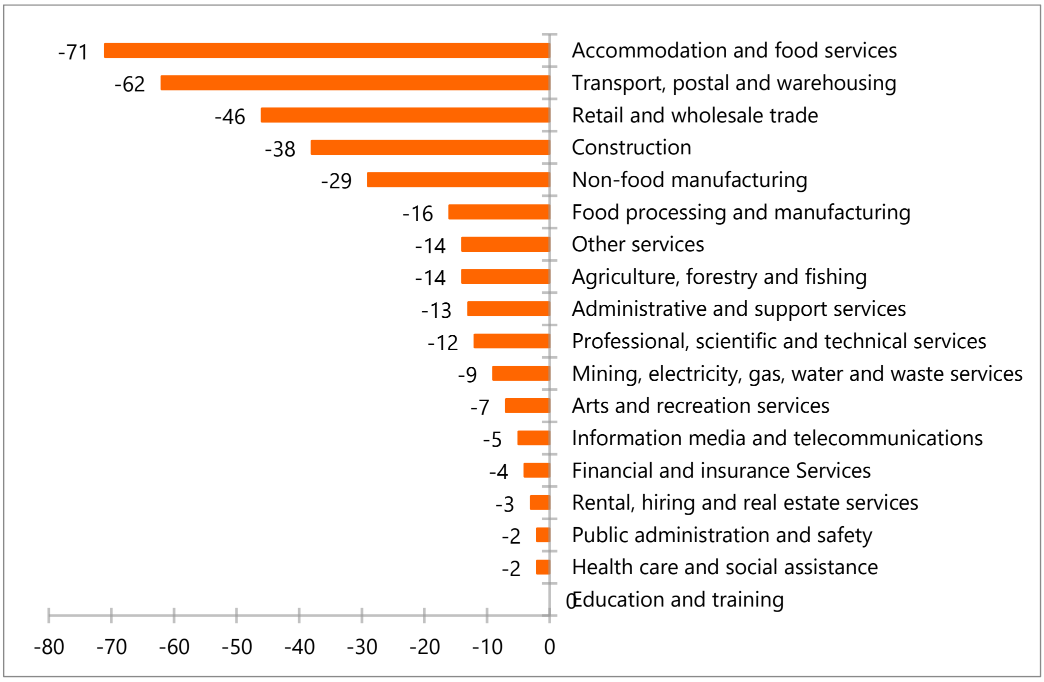


Māori households will also be hard hit

The Māori unemployment rate in Taranaki has historically been more than double the overall rate. In the year to March 2019 the Māori unemployment rate stood at 13.3% compared with 5.0% region wide. This gap is likely to stay wide as Māori are highly exposed to industries that will experience large job losses in Taranaki.

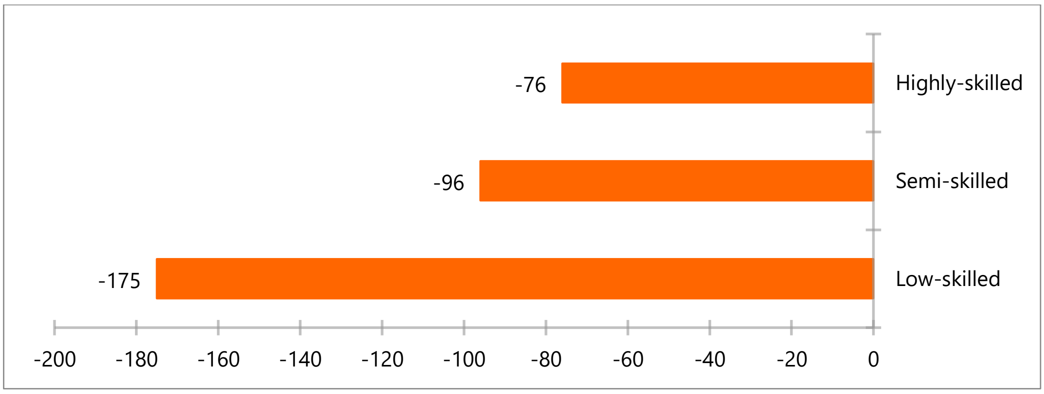
The principal impacts on Māori employment in Taranaki are forecast to take place in the accommodation and food services (-71 jobs), transport and warehousing (-62), retail and wholesale trade (-46) and construction (-38) industries.

Māori employment changes by broad industry, 2020-2021



The largest declines in employment by skill level for Taranaki's Māori population are forecast to occur in low-skilled (-175 jobs) roles.

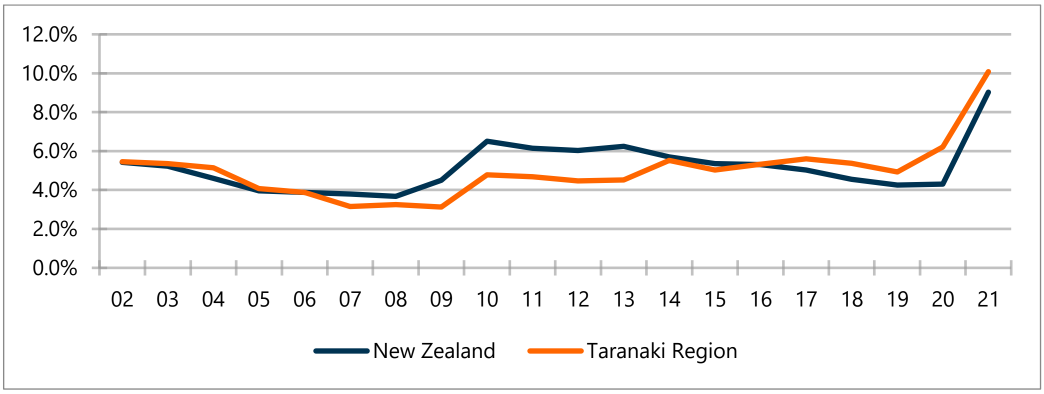
Māori employment changes by skill level, 2020-2021



Job losses will push unemployment to 10.1%

Taranaki's overall unemployment level is forecast to rise from 5.3% in the December 2019 quarter, to 10.1% in March 2021. This compares to a forecast national unemployment rate of 9.0% by March 2021.

Unemployment rate, 2002-2021



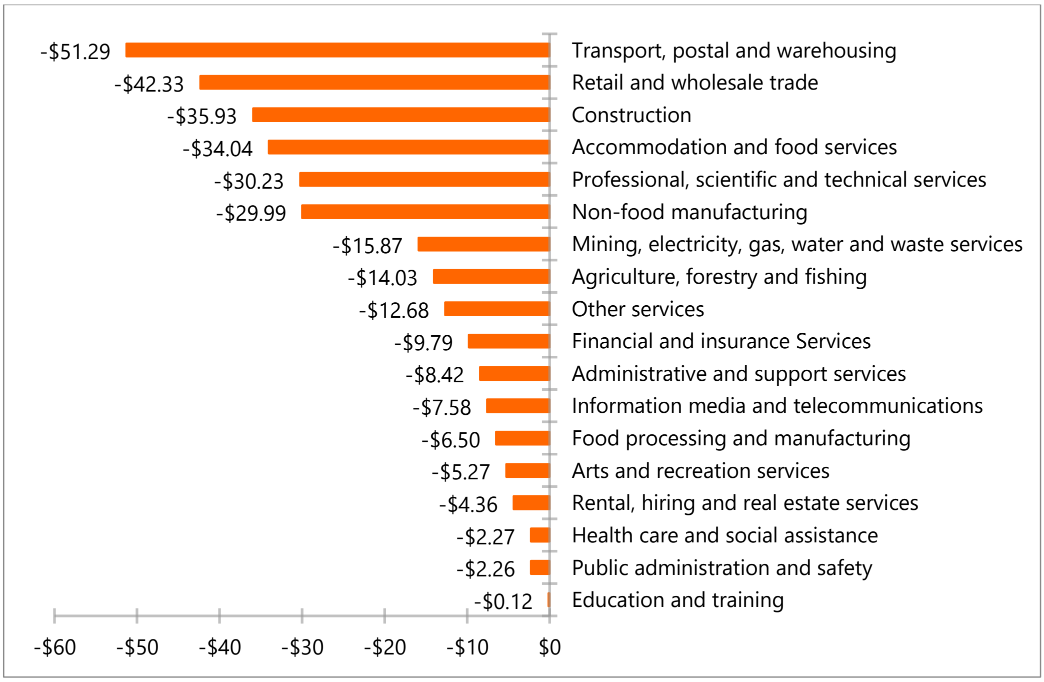
And result in lost earnings of $312m

We estimate that a nearly $3.5b was earned through wages and salaries in Taranaki in the year to March 2020 and this will decline by $312m to $3.2b in the year to March 2021.

Approximately 84% of household income in Taranaki is earned as wages and salaries (including from self-employment) in the labour market, the rest is earned through government transfers such as benefits, superannuation and student allowances. By contrast 90% of household income in the national economy is earned as wages and salaries.

The largest declines in earnings are expected to occur in transport, postal and warehousing (-$51m), retail and wholesale (-$42m), construction (-$36m) and accommodation and food services (-$34m).

Change in earnings by broad industry, 2020-2021 ($million)



The table below shows that Taranaki's total earnings in the labour market is expected to decline by 9.0% over the year to March 2021 which puts it in the middle of the pack among the 16 regional council areas.

% Change in earnings by regional council areas, 2020-2021

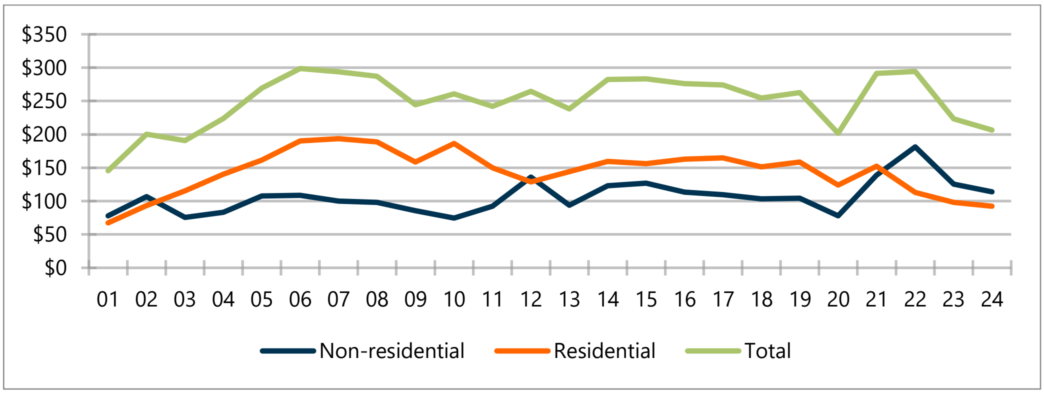
Region	Change
West Coast Region	-11.1%
Otago Region	-11.0%
Canterbury Region	-9.8%
Auckland Region	-9.5%
Nelson Region	-9.1%
Southland Region	-9.0%
Taranaki Region	-9.0%
Tasman Region	-8.7%
Marlborough Region	-8.7%
Northland Region	-8.5%
Wellington Region	-8.5%
Bay of Plenty Region	-8.2%
Waikato Region	-8.1%
Hawke's Bay Region	-7.9%
Manawatu-Wanganui Region	-7.5%
Gisborne Region	-7.4%
New Zealand	-9.1%

Non-residential construction could support recovery in Taranaki

Infometrics expects residential construction activity in Taranaki to fall to levels last seen in the early 2000s. Soaring unemployment, a sudden termination of immigration, and falling house prices are set to slow new residential developments in their tracks.

Prospects for non-residential construction are more positive. Our forecasts include the planned $300m wing for the Taranaki Base Hospital. This project will be vital for the construction sector and the recovery of the Taranaki economy. Without this project construction activity could drop to levels which are very low by historical standards.

Real value of work put in place, residential and non-residential (2000-2024, 2009/10 prices)



Some thoughts on recovery

Housing affordability and lifestyle benefits can be assets

Over the next several years, recessionary condition might give rise to increased levels of domestic migration. We anticipate that increased unemployment and high costs of living in the main urban centres, might provide a competitive edge for regions offering lower property prices and high-quality lifestyle attractions. This is likely to be reinforced by an increased capacity for working remotely, as the pandemic has forced many organisations to improve their systems and practices in this area.

With low house prices and an attractive lifestyle offering Taranaki is well positioned to take advantage of any such increase in domestic migration.

Skills development and retention will be key

Increased unemployment will lead to increased interest in tertiary and vocational education. Constrained economic conditions will present fewer opportunities for school leavers and recent graduates to enter the workforce, while recently unemployed workers will explore options for retraining and up-skilling. Under these conditions, the government's Reform of Vocational Education (RoVE) process will assume even greater importance than before the recession.

While much of the detail around the RoVE process is yet to be finalised, local government support for the process will be critical in promoting economic recovery and enhancing future resilience in the local workforce.

Councils and key regional stakeholders will need to play a leading role in implementing the RoVE outcomes. In particular, they will need to be centrally involved in the establishment and operation of structures such as the Regional Skills Leadership Groups (RSLGs), that will be a critical outcome of the RoVE process.

Infrastructure development is an opportunity

Government has prioritised the identification of 'shovel ready' infrastructure projects, that can assist in economic recovery across the country. These projects are likely to be funded through a range of support mechanisms, including Crown Infrastructure Partners, New Zealand Upgrade Programme and possible even a realignment of the Provincial Growth Fund.

In addition to an immediate focus on these 'shovel ready' projects, we believe that regions have a window of opportunity to develop projects with somewhat longer implementation timeframes. If sufficiently ambitious, such projects can provide a step change in the economic development trajectory of regions. Projects that fall into this category might include enhanced water management, localized renewable energy generation and distribution, and transportation infrastructure such as inland ports or customs-controlled areas.

Local government will play a critical role in the recovery

Local governments will play a critical role in supporting local communities over the coming months and years. Some of the measures that the councils and its partners might consider include:

- Maintaining levels of operational expenditure and where possible accelerating already funded capital projects
- Implementing preferential procurement policies to support local businesses rather than those located outside the Region (or even outside New Zealand)
- Increased investment in community development activities, particularly in vulnerable and highly impacted communities
- Highly localised destination marketing activities, aimed firstly within the Region's communities, and only subsequently being extended to neighbouring communities and further afield in New Zealand
- The extension of business support services, particularly in partnership with regional economic development agencies, as well as local chambers of commerce, industry bodies and organisations such as the Regional Business Partners Network or Business Mentors New Zealand
- Maintaining a balance between rates increases required to fund ongoing and future activities, and increasing financial stress in the community
- Leveraging off the existing local public asset base – prudent borrowing against assets or depletion of financial reserves in the short to medium term
- Support for local vocational and tertiary education providers, to promote reskilling within local communities
- Support for and participation in bodies such as the Regional Skills Leadership Groups
- Developing infrastructure projects beyond the most obvious "shovel-ready" project that might already be under consideration through various central government support measures
- The development of comprehensive local wellbeing-based economic development strategies, in line with government's Living Standards Framework and other international best practice in the field of wellbeing economics. An an example of this is the Taranaki 2050 Roadmap which includes wellbeing work.

These and other activities, while unable to avert the inevitable unemployment increases and economic distress, can ease the impacts of the recession, increase the resilience of the Taranaki community, and support economic recovery in the longer term.

Appendix I. Forecast Assumptions

We have made the following assumptions when modelling the effects of the COVID-19 pandemic, the economic downturn, and the government's policy responses on the New Zealand economy.

Lockdown is 4½ weeks at Level 4 and 2 weeks at Level 3

Following the Prime Minister's announcement on April 20 of the expected timeline for the COVID Alert Level 4 and Level 3 conditions, we have based our industry employment and output modelling on Level 4 being in place for 4½ weeks and Level 3 being in place for two weeks.

Across the entire economy, we estimate that approximately 65% of economic activity can take place under Level 4. This estimate includes people that can work from home and those people working in essential services. Under Level 3, our estimate of potential economic activity taking place rises to 82%. Obviously, the effects of Alert Levels 3 and 4 on specific industries vary significantly.

We have not made economy-wide adjustments for conditions in Alert Levels 1 or 2 because the constraints on activity are much less widespread. Instead, we have made specific targeted adjustments to industries associated with tourism (see below). These industries will be the most heavily and directly affected by COVID-19 over the medium term, almost irrespective of the alert levels implemented by the government at any particular point in time.

Sustained global demand for food, but non-food exports will be knocked hard

Forecasts of global economic growth for 2020 are being rapidly revised lower due to the COVID-19 pandemic, lockdown conditions, and negative effects on economic activity around much of the world. Between February and April, Consensus forecasts for global growth during 2020 have slumped from +2.3% to -2.5%. We expect further revisions in coming months will take this figure to -5.0% or below.

This downturn will have some effect on New Zealand's agricultural export prices for products such as dairy, meat, and horticulture. However, the fact that people still need to eat during a recession will limit the pressure on our agricultural producers. Furthermore, the drop in the New Zealand dollar, from US67c at the start of the year to below US60c, has offset some of the decline in international prices.

The most pressure will come on non-food exports such as forestry and manufactured products. Putting aside the disruption to movements of goods that occurred early in the year with the shutdown of ports in China, weaker incomes and spending around the world will limit both business and consumer demand for manufactured products.

During 2009, we saw a 5.9% decline in New Zealand's non-food manufactured export volumes. With the current global downturn being significantly larger than the Global Financial Crisis (GFC), we have allowed for a 16% contraction in volumes over the coming year. Alongside this drop, we have also assumed a 9.5% reduction in international demand for unprocessed forestry exports such as logs.

Foreign tourism tanks by 91%

We expect New Zealand's borders to effectively remain closed for a year, with either complete closures or, at a minimum, a mandatory 14-day quarantine requirement for people arriving from overseas. However, we also recognise that there is scope for a trans-Tasman or wider Polynesian travel "bubble" to be introduced later in the year if COVID-19 infection conditions allow. We have assumed that this "bubble" could be implemented from December onwards, and could result in 50% of usual tourist travel on NZ-Australia and NZ-Pacific Island routes.

Travel up until November will be very limited – we have allowed for visitor numbers to be at just 0.8% of their usual levels. This figure allows for a small amount of non-holiday travel, and it is equivalent to total international arrival numbers (including returning New Zealanders) for the week to 14 April 2020. We have also maintained this assumption for countries outside Australia and the Pacific Islands beyond November 2020, on the basis that COVID-19 case numbers overseas will warrant ongoing strict controls. The allowance for small visitor flows in and out of New Zealand recognises there will be some people who are required to travel for work purposes.

Taken together, these assumptions result in an estimated 91% reduction in foreign demand for tourism over the coming year, and a similarly sized reduction in New Zealand demand for international tourism.

Domestic tourism spending drops by 21%

With New Zealanders effectively unable or unwilling to travel overseas during the coming year, at least some of the pool of $5.4b that was spent on international tourism during 2019 is likely to be spent on holidays within New Zealand instead.

Having looked at domestic and international tourism spending patterns, we estimate that total spending on a holiday in New Zealand is likely to be about 69% of what would be spent on an equivalent holiday overseas. Some of this gap arises because a domestic holiday will naturally involve less spending on airfares. Furthermore, people on holiday within their own country also tend to spend less, on average, on both accommodation and eating out.

Reallocating this proportion of overseas tourism spending by New Zealanders to domestic spending results in a total pool of about $21b of potential spending for the coming year. However, the economic downturn will have a negative effect on people's willingness to spend on travel and holidays. For example, there was an 8.6% drop in annual spending on restaurants and hotels between March 2008 and December 2009 during the GFC.

Furthermore, there have been severe limitations on people's ability to travel domestically during the 6½ weeks of Level 3 and Level 4 lockdown, and these restrictions will only be partially relaxed when we move to Alert Level 2. We note that The Treasury's Scenario 1 assumes we could remain in Alert Levels 1 and 2 for a total of 10 months, although the specific timings across each of these Alert Levels is not stated.

Taking all these considerations together, we estimate that spending on domestic holidays over the coming year could be constrained by 35%. After incorporating the increased pool of potential spending due to a lack of international travel, these constraints imply a 21% decline in domestic tourism spending from the previous year.

International education revenue halves

Data up to 2018 shows that, for international fee-paying students in New Zealand, 50% were enrolled at Single Data Return (SDR) providers such as universities and polytechnics, 31% were enrolled at non-SDR providers that largely cater to international students, and 20% were enrolled at primary and secondary schools. We have made differing assumptions about how each of these providers will be affected.

We have assumed that non-SDR providers will be knocked heavily, with the relatively short nature of many of their courses meaning they are not conducive to students being quarantined for two weeks on arrival in the country. We expect an 82% reduction in student numbers over the coming year, with virtually all the surviving revenue arising from students who were already in the country before border restrictions were implemented. This assumption is based on media reports suggesting about 3,000 of the 17,000 students that would normally be trained at English language schools during the year were already here and being taught when the border closures occurred.

In early April, Universities New Zealand's chief executive Chris Whelan stated that universities are facing a 25-33% reduction in international student numbers this year. In our view, this expected decline might prove to be too small, particularly given that there must be serious doubts about the mid-year intake of students that would normally occur in July. We have opted for a bigger reduction in international student revenue across all SDR providers, with universities retaining 62% of their international student revenue this year – mostly thanks to students who were already in the country in January and February. Our figure has also been informed by Immigration NZ's visa approval data for March, which showed a 43% reduction in student visa approvals compared with March 2019.

International education at a primary and secondary level will be less affected by the pandemic and border closures, given that the school year started in early February before most of the effects of COVID-19 appeared in New Zealand. We are aware that some students will have chosen to return home, and that students that might have come later in the year will now not do so. We have allowed for the number of international students at schools this year to be 79% of normal levels.

Taken together, these figures imply a 49% reduction in international education revenue during 2020, which we have included in our modelling.

Domestic education picks up some of the slack

During periods of labour market weakness, there is an increased propensity of people to leave, or stay out of, the workforce and undertake study instead. For example, between 2008 and 2010, the number of domestic equivalent full-time tertiary students (EFTS) increased from 235,100 to 254,500, a rise of 8.3%. This lift contrasts with the periods of labour market strength between 2004 and 2008, and again between 2012 and 2018, when domestic EFTS numbers fell by 3.3% and 10.4% respectively.

Demographic factors, such as the number of school leavers, can also play a role in determining overall student numbers. Between 2008 and 2010, over half the increase in student numbers could be attributed to a lift in the number of students completing secondary school compared with three years prior. In contrast, since about 2012, the number of Year 13 students has been relatively stable, meaning that any changes in total tertiary student numbers now are more a reflection of economic conditions or other factors influencing training choices, such as the government's tertiary fees-free scheme.

Bearing these factors in mind, we have allowed for a similar lift in total demand for tertiary training over the coming year as we saw following the GFC. However, the change in demographic trends compared with a decade ago means that the implied increase in underlying demand for training will be greater than in the wake of the GFC.

House prices and construction activity take a hit

The substantial rise in unemployment associated with many of the outcomes summarised above will have a significant negative effect on the housing market. Furthermore, border closures for the next year mean that net migration will be close to zero, and population growth is set to drop to a 30-year low of 0.5%pa. These results will limit the number of potential buyers in the housing market as well as considerably reducing underlying demand for new housing.

Our assumptions include an 11% drop in average house prices between mid-2020 and the end of 2021. We note that house price falls in the short-term will be restrained by the mortgage holiday scheme that the government has negotiated with retail banks. Nevertheless, this housing market downturn will drag down the rate of new residential construction, particularly given that banks are likely to be very reluctant to finance property development over the next year. Nationally, we estimate the value of residential building work put in place to decline by 19% over the year to March 2021.

Non-residential construction activity will also come under downward pressure given declines in key drivers for space such as employment, household spending, and tourism activity. We estimate the value of non-residential work put in place to decline by 18% over the year to March 2021

In contrast, prospects for civil construction are positive outside Level 4 lockdown conditions. Nevertheless, we are cautious about the potential for an immediate lift in activity caused by government stimulus and increased spending. Although there is likely to be faster growth in infrastructure activity over the medium term, we anticipate that planning, design, and consenting requirements will prevent more rapid growth in work until 2022.

Government stimulus includes $10b wage subsidy and benefit increases

We have made allowances for two major government initiatives in our modelling. The first of these initiatives is the wage subsidy scheme, which represents a cash injection of approximately $10b to businesses to help meet their labour costs. The total fiscal cost of this scheme has risen over time, although the rate of increase appears to have slowed over the last week or so.

We note that there could be scope for the scheme to be extended beyond 12 weeks for selected businesses that continue to be negatively affected under Alert Level 2, although the government has not made any strong signals about an extension at this stage. Indeed, an extension of the scheme might not be sufficient to secure the ongoing viability of many businesses that are dependent on tourism activity anyway.

The second initiative we have included in our modelling is the one-off increase in social welfare benefits of $25 per week. This change represents a boost to aggregate household incomes of around $2.5b. In tandem with the wage subsidy scheme, this additional money from the government will mitigate the negative effects of falling employment on overall household incomes. In doing so, the policies will also limit the decline in household consumption spending that results from the economy's downturn.

There is obviously significant potential for additional government stimulus to be introduced in coming weeks and months. Further fiscal initiatives are likely as the public health response to the COVID-19 pandemic becomes less critical and more of the policy focus turns to measures that could help drive the economic recovery. The government's 2020 Budget is due to be announced on May 14, and this date will be a key one.

At this stage, we have not made any specific allowance for additional fiscal measures. In our view, it is likely that their effectiveness in accelerating economic growth is likely to be limited within the next 12 months. We expect the negative effects of the pandemic, the lockdown, and the failures of tourism and hospitality businesses will continue to ripple through the economy for some time. These effects will weigh heavily on business and consumer confidence, influencing spending and investment decisions, and reducing the immediate effectiveness of any government initiatives designed to try and boost economic growth.

Appendix II. Broad approach to modelling the impact of COVID-19 on the Taranaki economy

Infometrics has drawn on a range of econometric and statistical model to measure the potential impact of COVID-19 on regional economies.

Forecasting the macroeconomy

Infometrics maintains a macroeconomic forecasting framework that underpins our five-year forecasts of activity across the national economy. Our framework accounts for the relationships between different sectors of the economy and their responsiveness to one another. These include the labour market, households, businesses, government, the international trade sector, and financial markets.

In times of economic upheaval, we refine the output from the framework based on expert input from our forecasting team, their knowledge of rapidly changing trends in the economy, and the insights we gain from our interactions with central government, Councils, Economic Development Agencies and private sector clients.

Overseeing the forecasting process and framework is Gareth Kiernan, who has been forecasting the New Zealand economy for more than 20 years. The framework provides quarterly forecasts of GDP, employment, unemployment, and a range of other macroeconomic indicators up to 2025.

Measuring impacts on individual industries

The pandemic will affect industries differently. To measure this, we have used Infometrics' general equilibrium (GE) model, which is designed to measure the impact of economic shocks on individual industries. We introduce shocks to the model, including a sharp decline in foreign tourism, declines in international education and non-food commodity exports, and a fall in productivity across affected industries. We also temper these shocks through the introduction of support measures such as the wage subsidy and an increase in benefit payments.

The GE model estimates the combined impact of these factors on future economic output and employment across 54 industries. In this sense, the GE model breaks down the national macroeconomic forecasts of GDP and employment to industry level.

Infometrics' GE model is maintained by one of New Zealand's foremost econometricians, Dr Adolf Stroombergen.

Measure the impact on regions and districts

Regions will also be impacted differently by COVID-19. Those with a large tourism industry, for example, will be hardest hit. To measure regional impacts, we draw on our Regional Forecasting Model (RFM), an econometric model that breaks down national industry forecasts to territorial authority level.

The RFM draws on historic trends, patterns and relationships, and projects these into the future. It creates multiple forecast models for every territorial authority and industry combination and using machine learning techniques, selects and applies the model which is historically determined to have best predictive ability. It then produces forecasts of GDP and employment across 54 industries for each territorial authority up to a predetermined point in the future, e.g. 2025 or 2030.