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

for Rotorua Lakes District Council

April 2020

Infometrics
Economics put simply

Authorship

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Executive Summary

COVID-19 presents the greatest economic shock in living memory, far exceeding anything experienced during the Global Financial Crisis (GFC) of 2008/09. Rotorua's economy is forecast to contract 7.8% over the year to March 2021, compared with a 7.9% contraction in the national economy, and deeper than the recession following the GFC when Rotorua's economy contracted 6.2% in the two years between the year to March 2008 and the year to March 2010.

The recession will result in job losses. Employment in Rotorua is expected to decline 10.5% or just over 3,700 jobs in the year to March 2021. This compares to an economy-wide decline in employment of 9.8%. Rotorua's unemployment rate could rise to 10.7% resulting in lost earnings totalling $186m in the year to March 2021.

A significant part of the expected economic contraction in Rotorua will be a direct result of the lockdown. An estimated 49% of the Rotoroua workforce was able to operate at Alert Level 4, rising to to 73% at Level 3. Consumer spending fell steeply during the lockdown as most retail stores were closed, and international tourism has been effectively wiped out by the closing of New Zealand's borders to foureign visitors.

Table 1 Summary of key indicators

Indicators: COVID-19 effects so far	Rotorua District	New Zealand
Change in consumer spending (week ending 12 April 2020 compared to same period 2019)	-55%	-56%
Change in heavy traffic (week ending 9 April 2020 compared to 1 February 2020)	-94%	-60%
% working at Level 4	49%	53%
% working at Level 3	73%	74%
Indicators: COVID-19 effects in the 12 months to March 2021		
GDP % change, year to March 2021	-7.80%	-8%
Job losses, year to March 2021	-3,756	-250,522
Employment % change, year to March 2021	-10.50%	-9.80%
Unemployment rate, March 2021	10.40%	9.0%
Loss in total earnings, year to March 2021 ($m)	$-185.66	$-14,191.29
Residential construction % change, year to March 2021	-39%	-19%
Non-residential construction % change, year to March 2021	-6.80%	-18%
Key assumptions (for year to March 2021 unless otherwise stated)		
Lockdown is 4½ weeks at Level 4 and 2 weeks at Level 3		
Approximately 65% of economic activity can take place under Level 4, 82% under level 3		
A 16% fall in non-food manufacturing export volumes		
A 9.5% reduction in international demand for unprocessed forestry exports		
A 91% reduction in foreign tourist spending in New Zealand		
A 21% decline in domestic tourism spending		
International students at schools 79% of normal levels		
A 49% reduction in international education revenue		
An 8.3% increase in demand for tertiary training from domestic students		
An 11% drop in average house prices between mid-2020 and the end of 2021.		
A $10b wage subsidy scheme and $2.5b through a one-off increase in social welfare benefits of $25 per week		

Post-Level 3, economic activity will remain constrained as the effects of the lockdown ripple through the local economy. The drop in international tourism will be most keenly felt in the accommodation and food services, retail, and arts and recreation sectors. Tourism accounted for 23% of employment in Rotorua in 2019 compared with 9.0% nationally, bringing $812million into the local economy. Domestic tourism is also expected to decline 21% nationally, as widespread job losses hammer consumer confidence and leave consumers cash-strapped. The sectors that support consumer-facing sectors such as transport and warehousing, and wholesale trade will feel the secondary effects of the decline in consumer spending.

Sectors that trade with the rest of the world will feel the effects of an expected global recession, particularly in China, our biggest trading partner. The forestry sector saw a steep decline in Chinese demand for logs during China's lockdown. Combined with a cessation of tree felling during New Zealand's Level 4 lockdown, log export volumes are currently around half of what they were this time last year. Non-food manufactured exports will also experience subdued demand throughout the rest of the year as economies across the globe enter recession as a result of their own efforts to contain the pandemic. Rotorua's international education industry is bigger than that of most other regions outside the main centres and will struggle with an expected halving in revenue from international students nationally.

There are some bright spots. Food exports, especially bulk commodities such as diary, are expected to decline only slightly, as food demand tends not to fall too much during recessions. Rotorua's large health sector is expected to fare reasonably well as declines in private health care, due to more austere economic conditions, are offset by people choosing to be treated in the public health sector. Domestic education is also expected to grow with job losses encouring people to enter eduction to reskill or upskill.

The next couple of years are going to be difficult, particularly for vulnerable, low-income households in which Rotorua's Maori and Pasifika populations are over-represented. Almost every industry will be affected by the Covid-19 pandemic and Government's measures to contain it. There is no one silver bullet, but steps can be taken to help mitigate the worst effects of the coming recession.

Like other regions, Rotorua will benefit from the Government's stimulus package, including the wage subsidy, which was extended by another eight weeks in the 2020 Budget, $15bn in infrastructure investment, some of which will hopefully fund Rotorua Lakes Council's $210m bid to Crown Infrastructure Partners, and funding to support trades training, vulnerable youth and a domestic tourism campaign. Council can also consider implementing preferential procurement policies, investing in community development activities, and extending business support services.

Skills development is also key. The setting up of the Regional Skills Leadership Groups to collate local labour market intelligence is an opportunity for local councils to improve the reallocation of labour so that people (re)entering eduction and training this year are choosing to develop skills that will be in demand when the recovery begins in 2022.

Introduction

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

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 district.

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 Gross Domestic Product (GDP), a measure of the economy's output, to be 6.6% below its December 2019 level. We estimate the unemployment rate[1] will peak at 9.5% in the September 2021 quarter, and will 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.

[1] The unemployment rate is calculated as the number of unemployed people as a percentage of the labour force. The labour force is the total of employed and unemployed people. A person is defined as unemployed when they are not in work, but are available for and actively seeking work.

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, nationally, 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[2] 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

[2] Tourism is treated as a type of spending rather than an industry in its own right. Tourism spending is estimated by summing a proportion (%) of spending across the following industries: accommodation (70%), food and beverage services (41%), road, rail and water transport (9%), air and space transport (88%), other transport, transport support, and travel and tour services (21%), rental and hiring services (31%), arts and recreation services (17%), retail trade (15%), education and training (8%), all non-tourism related industries, imports sold directly to tourists by retailers (2%). Source: StatsNZ, Table 25, pg 51, Tourism Satellite Account: 2018

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.

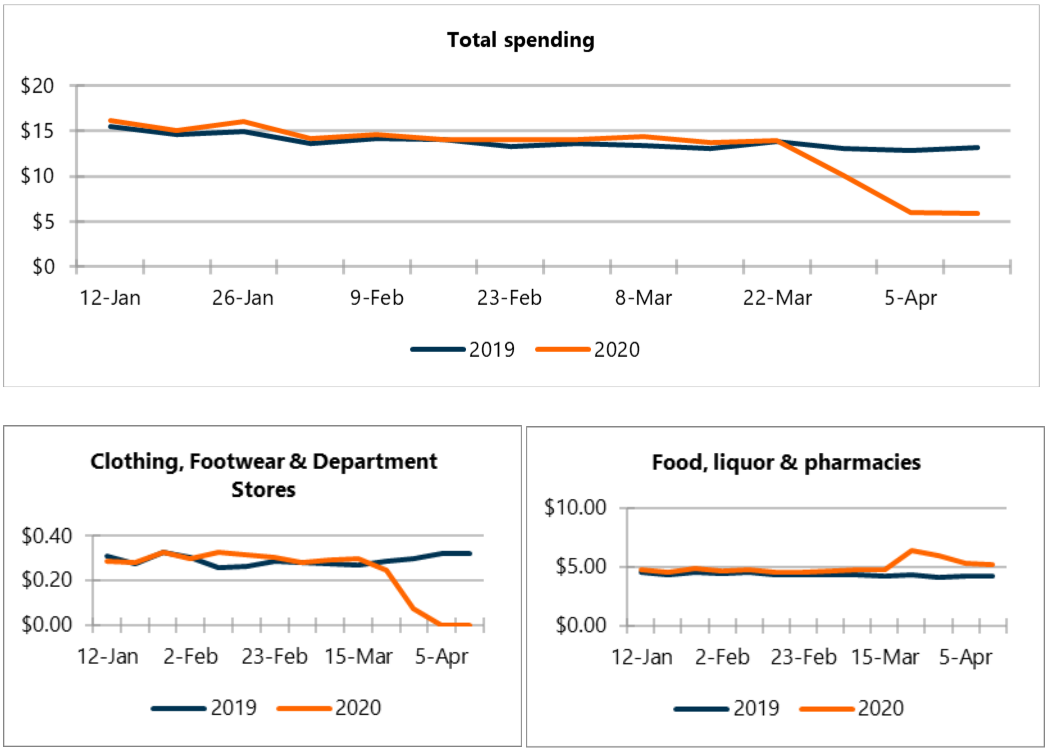
The Level 4 lockdown has rocked the Rotorua economy

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

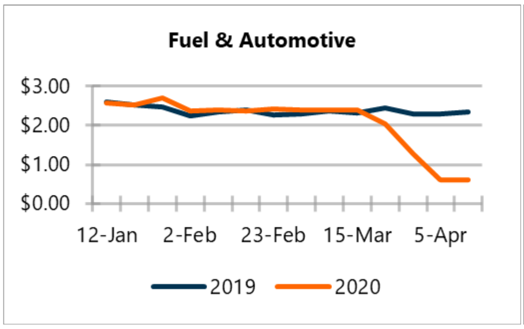
Consumer spending has fallen off a cliff

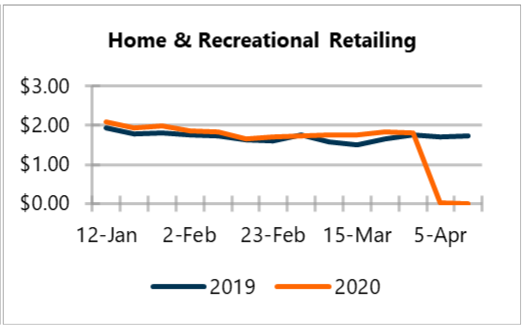
Consumer spending (spending by individuals and households)[3] in Rotorua declined rapidly in the first week of the Level 4 lockdown. Spending in the week ending 12 April was 55% lower than in the same week in 2019. Nationally spending declined by 56%. The only category in which spending has held up and even increased compared with 2019 was food, liquor and pharmacy.

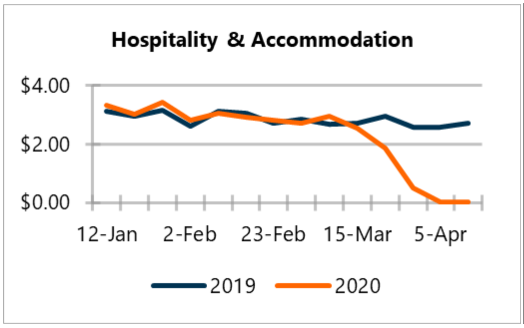
Chart 1 Consumer spending through Paymark network ($m)

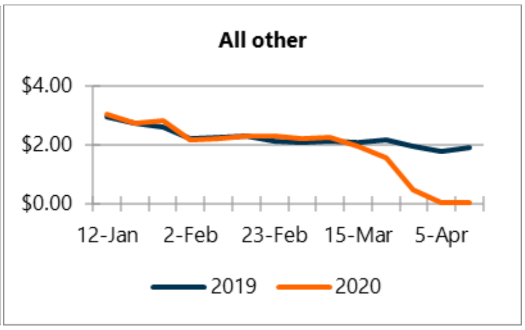


[3] The consumer spending data is sourced from Marketview. It measures total electronic card spending by individuals and households using spending through the Paymark network and adds to it an estimate of non-Paymark network spending using the pattern of BNZ card holder spending at non-Paymark retailers.





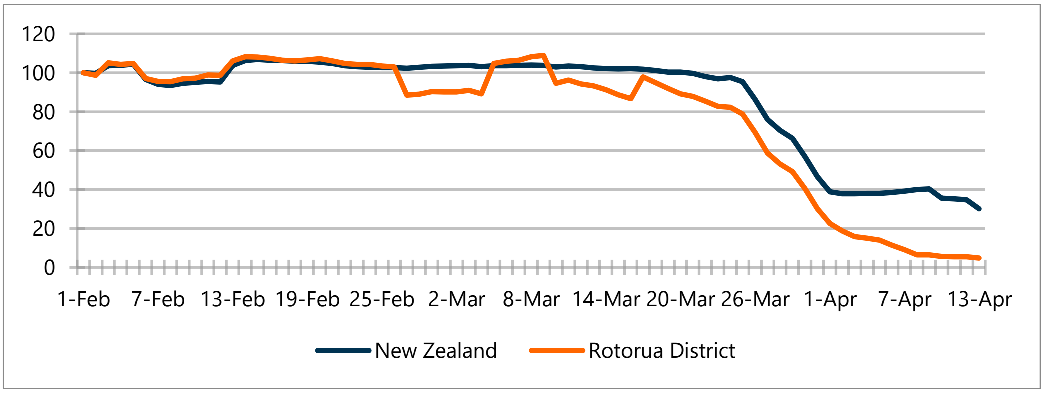




Traffic flows have dwindled

According to data from NZTA, heavy traffic flows[4] in Rotorua 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 greater proportion than in the national economy, suggesting that economic activity is suffering more than other parts of the country. Heavy traffic flows in Rotorua decreased 94% in the week ending 9 April 2020 compared with 1 February 2020. The decline was 60% nationally.

Chart 2 Heavy traffic flows, Index, 1 Feb 2020 = 100

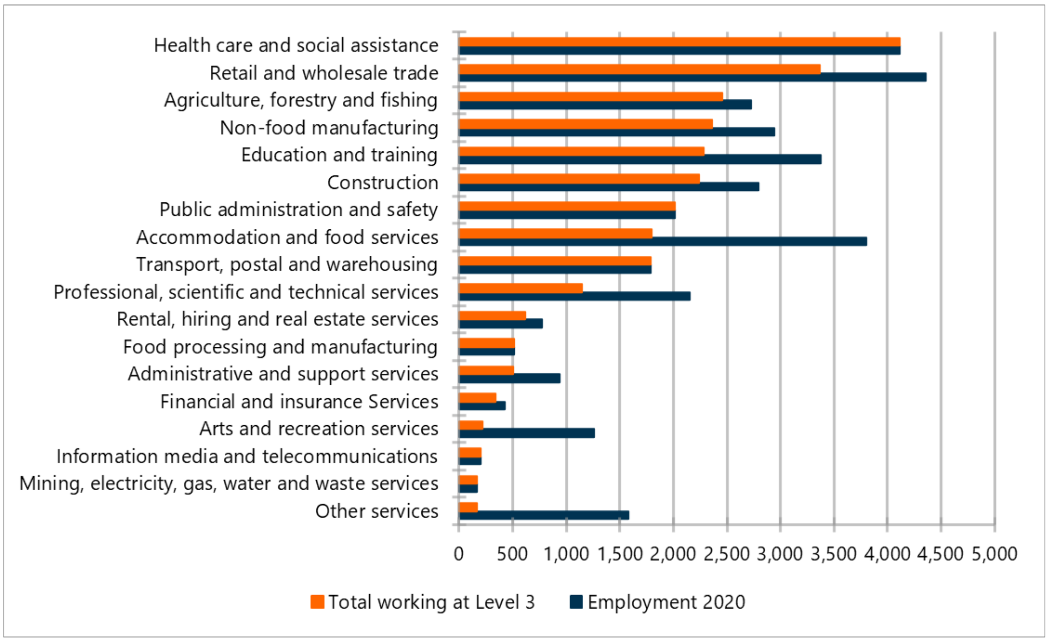


[4] Traffic flow data are calculated from the number of vehicles passing approximately 110 sites monitored by New Zealand Transport Agency. Each of the sites has been mapped to a territorial authority.

49% are working at Level 4 which will rise to 73% at Level 3

We estimate that during the Level 4 of the lockdown, approximately 49% of the total Rotorua workforce was able operate either by working from home, or being employed in essential services. In the national economy 53% could work at Level 4. At Level 3, the rate for Rotorua rose to 73% compared with 74% in the national economy. Accommodation and food services, and retail and wholesale trade have been particularly affected by the lockdown. Even at level 3, business that are able to open are unable to operate at full capacity due to social distancing and other health and saftey requirements.

Chart 3 Rotorua Workforce operating at Alert Level 3



Rotorua sits towards the bottom 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 Rotorua, as well as 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.

Rotorua will fare better than the likes of Queenstown, Mackenzie, Westland, and Kaikōura, however employment in Rotorua is forecast to decline by more than the national average in the year to March 2021. Rotorua is exposed to the drop in international tourism, the struggling forestry sector and its international education sector is quite large compared with many other TAs outside the main centres. However, Rotorua benefits from having large health and primary/secondary education sectors, as well as a reasonably sized dairy farming sector.

Rotorua is highly exposed to international tourism

Tourism accounted for 23% of employment in Rotorua in 2019 compared with 9.0% nationally, bringing $812million into the local economy. The steep fall in tourism spending will be a major blow to the district.

Just over 40% of tourist expenditure in Rotorua is from international visitors, which is close to the national average. Domestic tourism will hold up much better than international tourism in the coming year. We estimate that nationwide, foreign tourism spending will fall -91% this year and domestic tourism spending will drop by -21%. As part of the 2020 Budget, the Government has committed a further $400m to fund a domestic tourism campaign. But there will be fierce competition between New Zealand's holiday destinations to attract domestic tourists.

Some of the remaining international tourism will be critical business travel, which will mostly benefit the main centres. With the borders closed, domestic tourists who might otherwise have travelled overseas will spend their holidays in New Zealand. But this will be more than offset by a reduction in consumer spending, particularly on discretionary (nice to have) items. The conference season was coming to a close before the lockdown. But looking ahead to next year, cash strapped businesses may be unwilling to splash out on conference registrations.

Accommodation and food services will be the part of the economy most heavily affected 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 expected contraction. Activity continued to be severely constrained under COVID Alert Level 3. Domestic travel will also remain restricted under post-Level 3 due to economic conditions.

Forestry facing supply and demand constraints

In the week ending 29 April, Stats NZ provisionally estimate that forestry exports were 47% lower than the same week in 2019.[5] This is chiefly due to forestry exports to China, our biggest market for exported logs, being down 54% over the same period. The reduction in exports is due partly to supply constraints. Forestry businesses had to all but close during the Level 4 lockdown as forestry was deemed one of the few primary industries that is not an essential service. The port operations required to load logs for export onto ships also had to shut down. Tree fellers were able to operate under Level 3, but social distancing and other health and safety measures mean most firms were unable to work at full capacity. However, forestry companies and their workforce have benefitted from the government's relief package, as well as a specific $100m package for the forestry industry which included redeploying forestry workers into other sectors such as conservation activities and roading work and maintenance.

In a sense, the drop in log export volumes happened at the right time. Demand for logs has fallen with stocks of logs on Chinese ports having increased significantly while parts of China were in shut-down. However, with the Chinese economy starting to re-open, this backlog of timber is expected to disappear relatively quickly prompting recovery in New Zealand log exports in the second half of this year.

International education in Rotorua larger than in many other TAs

New Zealand had more than 110,000 international students in 2019, and just over 2,000 studied in Rotorua making it one of the biggest international student populations outside the main centres. Most of these students were attending the district's tertiary education institutions such as the Toi Ohomai Institute of Technology. Just over 10% were attending the district's schools.

A large number of international students were unable to enter New Zealand due to the border closure. The Toi Ohomai Institute of Technology will be relatively protected from any adverse financial effects of this shortfall, having become a subsidiary of the New Zealand Institute of Skills and Technology (NZIST) on 1 April 2020. But with 17% of Toi Ohomai Institute of Technology's income coming from international students in 2018 (about average for the Institutes of Technology and Polytechnic (ITP) sector as a whole), any drop in international student revenue will have an impact on the institute's bottom line.

In 2018, international student tuition fee income to schools totalled just under $194million nationally - an average of just under $9,000 per student. Therefore any drop in the number of international students because of the recent border closure will have a significant impact on school funding. International students also support local businesses through their spending on consumer items and services, so any reduction in their numbers this year will be a further blow to local businesses.

[5] Source: https://www.stats.govt.nz/information-releases/effects-of-covid-19-on-trade-1-february22-april-2020-provisional

Health care will continue to be a major employer

Health care and social assistance is a major employer in Rotorua, making up 11% of all employment in 2019. Health care is also one of the few sectors that is not expected to experience a decline in employment in the coming year. Health care facilities, including residential aged care facilities, remained open during the Level 4 lockdown and central government's decision to go hard and go early meant that the healthcare sector has not been overwhelmed by people suffering from COVID-19 as it has in other countries. Looking forward, we expect demand for private healthcare will drop with declining incomes. However, we expect modest growth in public healthcare from patients who would otherwise have been treated privately.

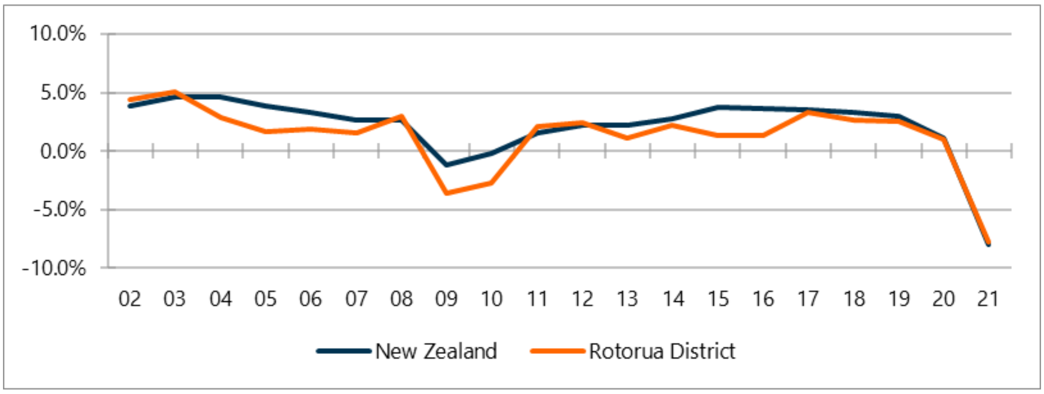
Primary exports are holding up but the drought is making a bad situation worse

Despite the widespread turmoil in international markets, New Zealand's exports of food products are holding up and for some commodities even growing slightly. Continued primary export strength and domestic demand for food items will support the district's dairy farming sector. Although the current drought presents a challenge, particularly to sheep and beef farmers. The drought has caused significant feed shortages which is forcing farmers to reduce their stock numbers at a time when processing capacity has been reduced as a result of the protocols that processing companies had to follow in order to operate during the COVID-19 lockdown. This is expected to lead to a flow on effect on pricing and returns, breeding stock retention and rural spending.

Rotorua's economy will contract by 7.8%

Rotorua's GDP is forecast to contract by -7.8% over the year to March 2021, compared with a -7.9% contraction in the national economy. The expected contraction in Rotorua is deeper than the recession following the GFC when GDP fell 6.2% in the two years between the year to March 2008 and the year to March 2010.

Chart 4 Annual GDP change, 2002-2021

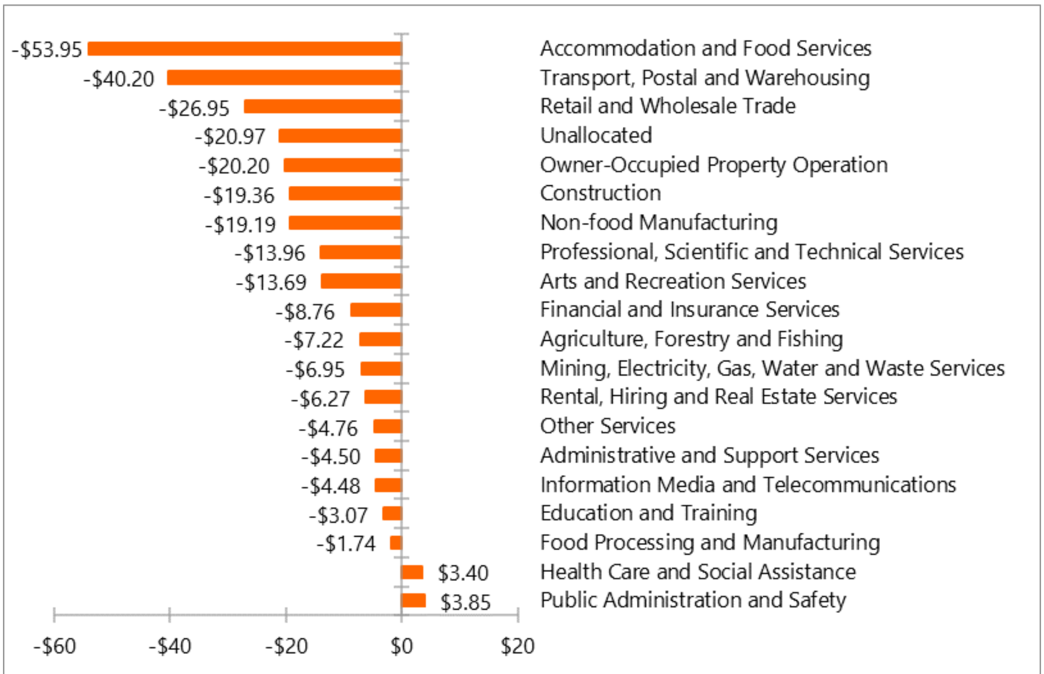


The accommodation and food services sector will take the biggest hit

The largest declines in the district will take place in accommodation and food services (-$54m,-35%), transport, postal and warehousing (-$40m, -20%) and retail and wholesale trade (-$27m, -8.3%). These declines will be slightly offset by growth in healthcare and social assistance ($3.4m, 1.3%) and public administration and safety ($3.9m, 2.3%).

The retail and wholesale trade, and the arts and recreation services industries will also feel the effects of the downturn in tourism. GDP in these industries is expected to decline -8.3% and -16.0% respectively.

Chart 5 Change in GDP by broad industry, 2020-2021 ($million)



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

- Accommodation and food services will be the sector most heavily affected 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 post-Level 3 due to economic conditions.

- 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. 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 have started 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 a reduction in overall spending caused by the weaker labour market, personal incomes and business profits.

- Retail and wholesale trade has experienced a significant drop in demand under Level 4, and to a lesser extent under Level 3. These effects are not being felt equally, with supermarkets enjoying periods of higher-than-usual demand. Other businesses that can sell online have been 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.

- 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 haven't explicitly incorporated Rotorua Lakes Council's $210m bid to Crown Infrastructure Partners for seven "shovel ready' projects because at the time of writing funding for the projects had not been confirmed. 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.

- 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 will experience job losses, despite the industry being less directly affected by COVID-19 than many other industries. 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.

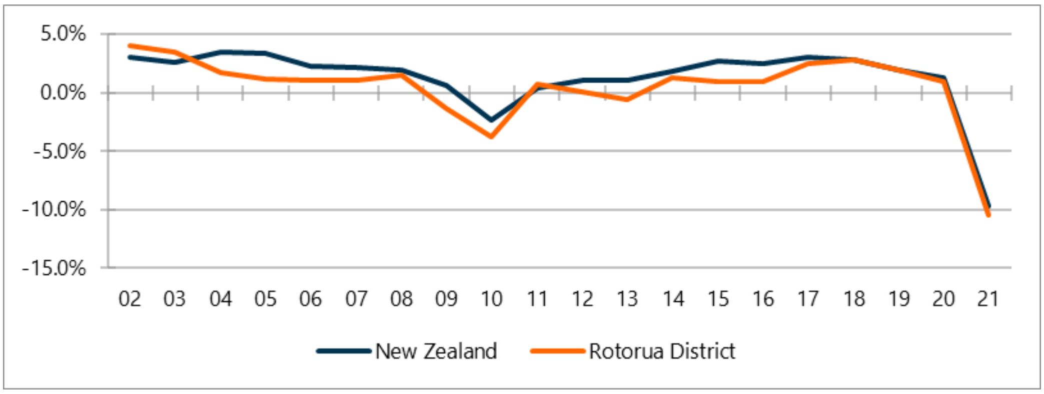
- Arts and recreation services are suffering the twin effects of a reduction in discretionary spending, including spending by tourists, and restraints on what services and products can actually be offered to consumers. Performing arts, professional and community sports, horse racing, casinos, and other entertainment and events will continue to be constrained at Alert Level 2 and, 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.

- 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 finance company collapses and the Global Financial Crisis.

More than 3,700 jobs will be lost

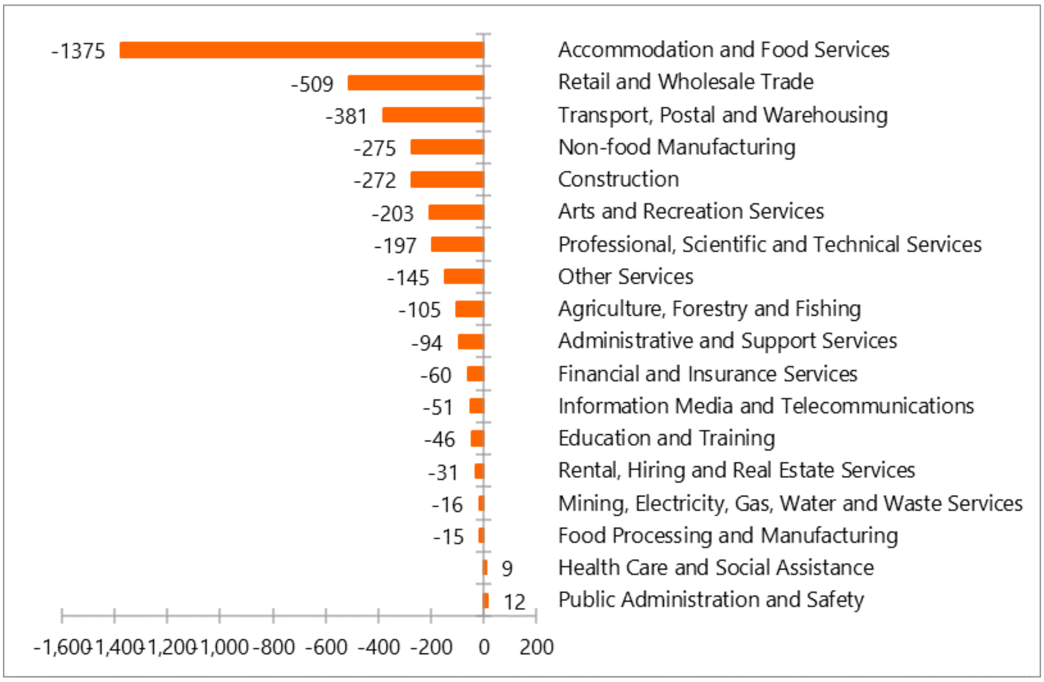
Employment in Rotorua, which includes both employees and the self-employed working in businesses located in Rotorua, is expected to decline from about 35,900 in the year to March 2020 to just under 32,200 in year to March 2021, a decline of -10.5% or just over 3,700 jobs. This compares to an economy-wide decline in employment of -9.8%.

Chart 6 Employment annual % change, 2002-2021



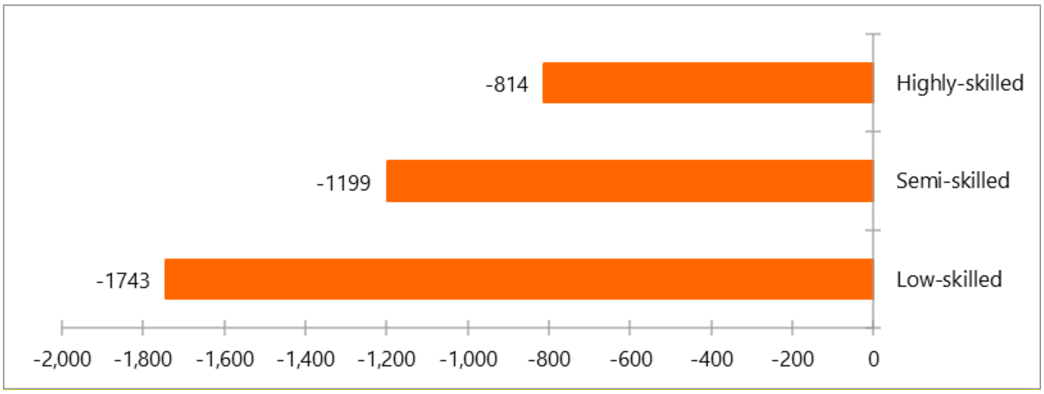
Industries showing the largest job losses are similar to the industries showing the largest declines in GDP. The bulk of job losses are forecast to be in accommodation and food services (-1,375 jobs), retail and wholesale trade, (-509), transport, postal and warehousing (-381) and non-food manufacturing (-275).

Chart 7 Employment change by broad industry, 2020-2021



Lower skilled jobs will be hardest hit

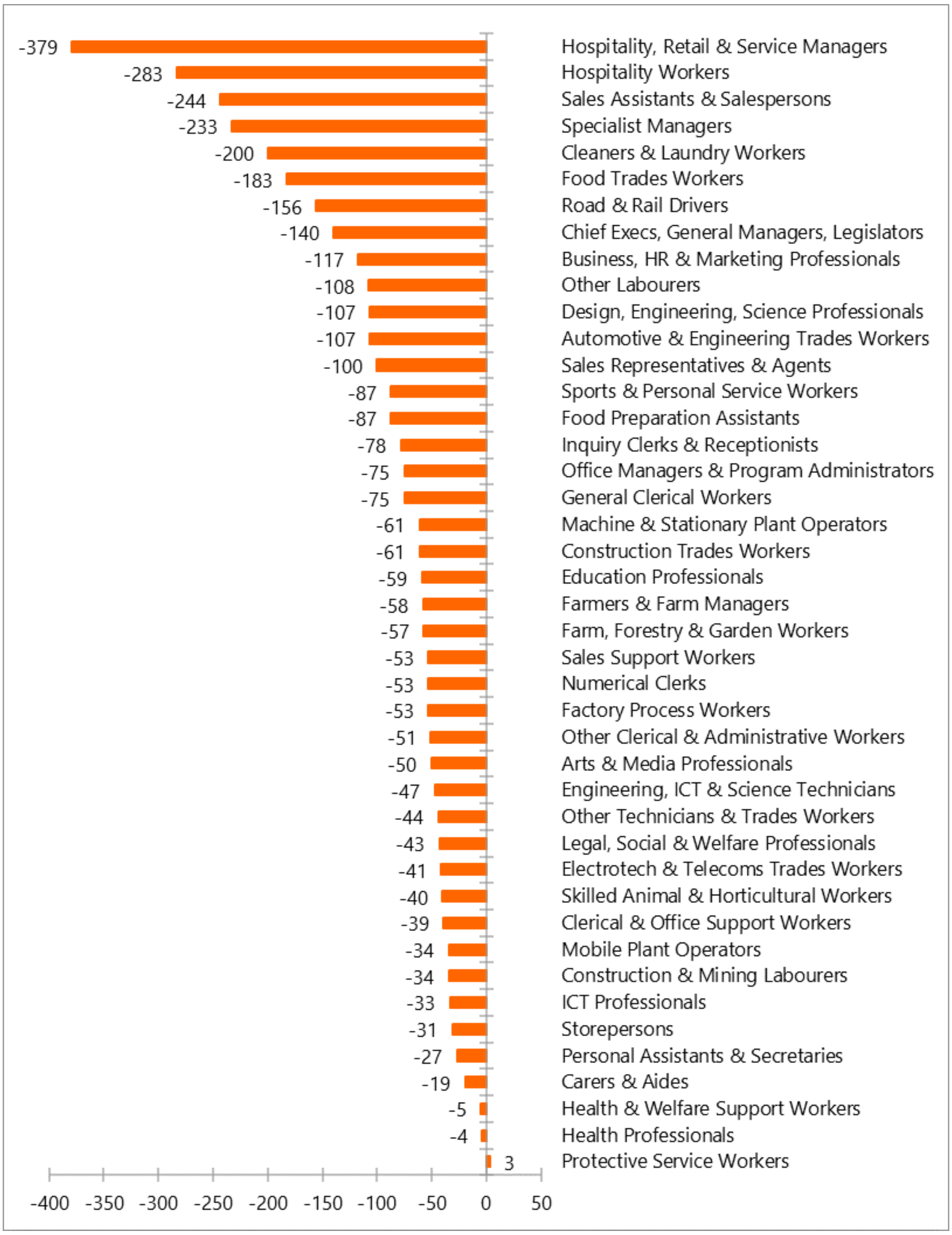
Chart 8 Employment change by skill level, 2020-2021



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 (-1,743) of all job losses will be lower-skilled.

A detailed breakdown of the types of occupations that are likely to experience the largest jobs losses is shown in the chart below. Heavy losses are expected for hospitality, retail and service managers (-379), hospitality workers (-283), sales assistants and sales persons (-244) and specialist managers (-233).

Chart 9 Employment change by occupation, ANZSCO Level 2, 2020-2021



Some jobseekers can move between industries

Certain occupations such as clerical and administration workers, 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 that face reduced supply of international work visa holders, backpackers and other overseas seasonal workers, as well as vacancies created by people retiring or leaving the workforce for other reasons.

Here, we analyse job losses in the clerical and administrative and labourer occupation groups across Rotorua'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.

Chart 10 Job losses in 'Clerical and administrative worker' occupations by broad industry, 2020-2021

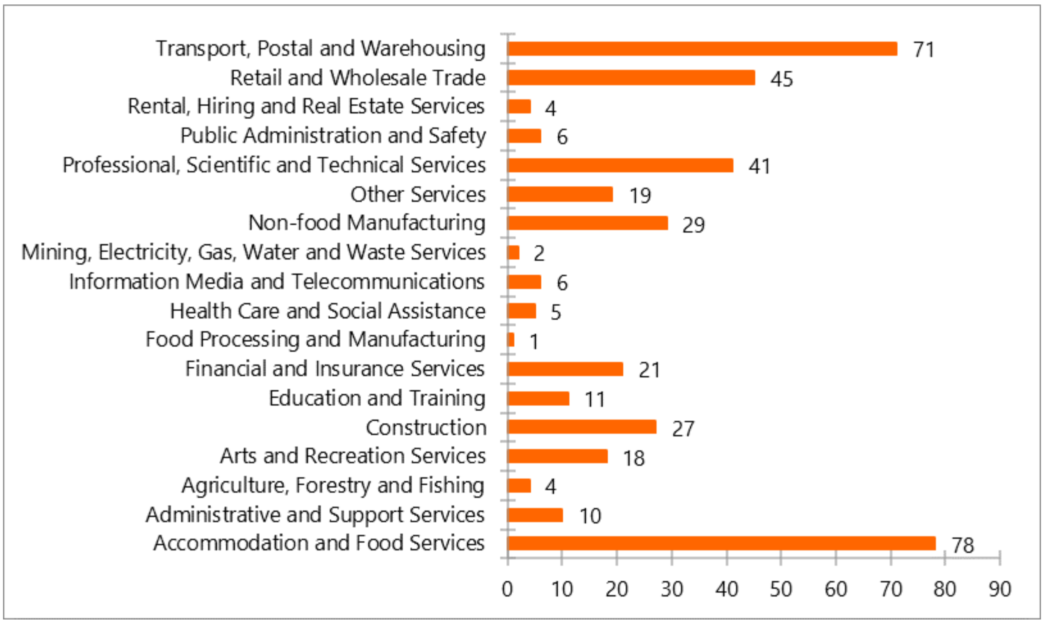
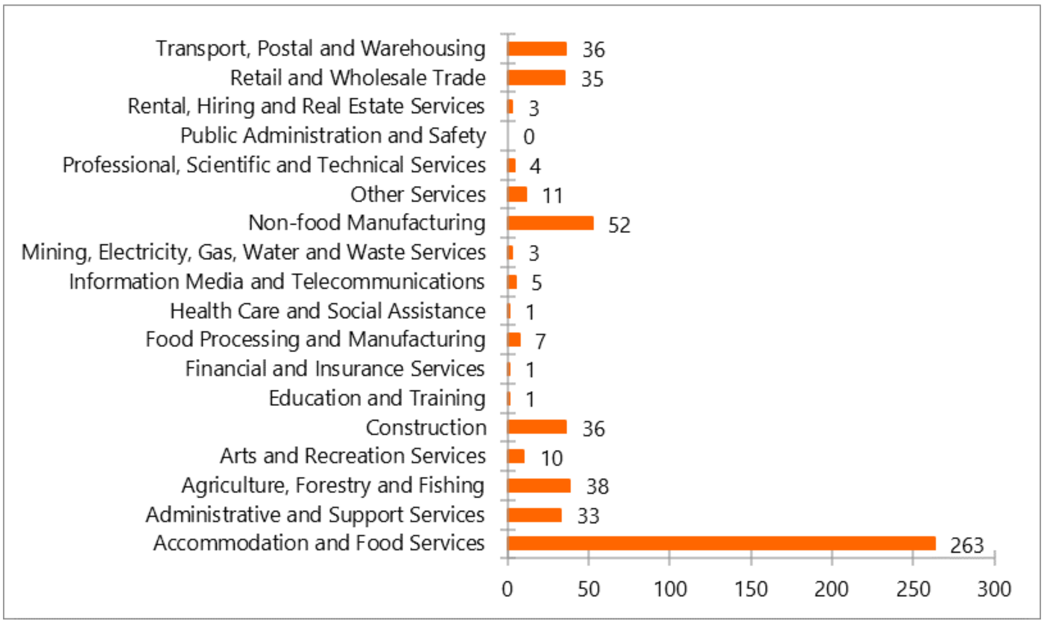


Chart 11 Job losses in 'Labourer' occupations by broad industry, 2020-2021

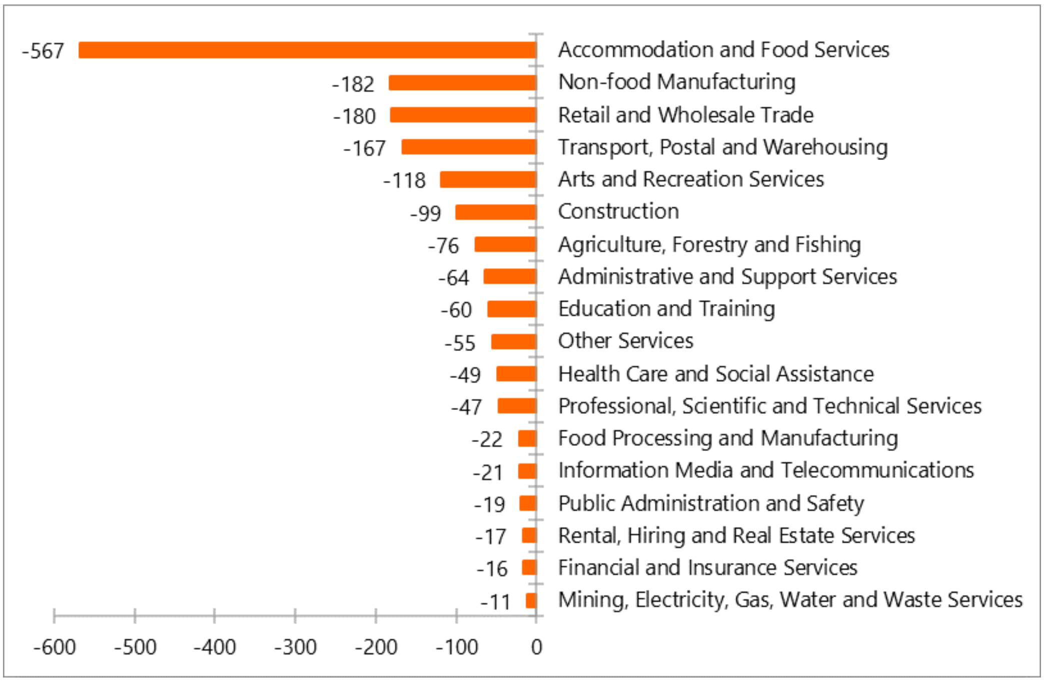


Māori households will be hard hit

The Māori unemployment rate in Rotorua has historically been higher than the unemployment rate for the whole workforce. In the year to March 2019 the Māori unemployment rate stood at 10.2% compared with 5.9% region wide. This gap is likely to remain wide as Māori workers are highly exposed to industries that will experience large job losses in Rotorua.

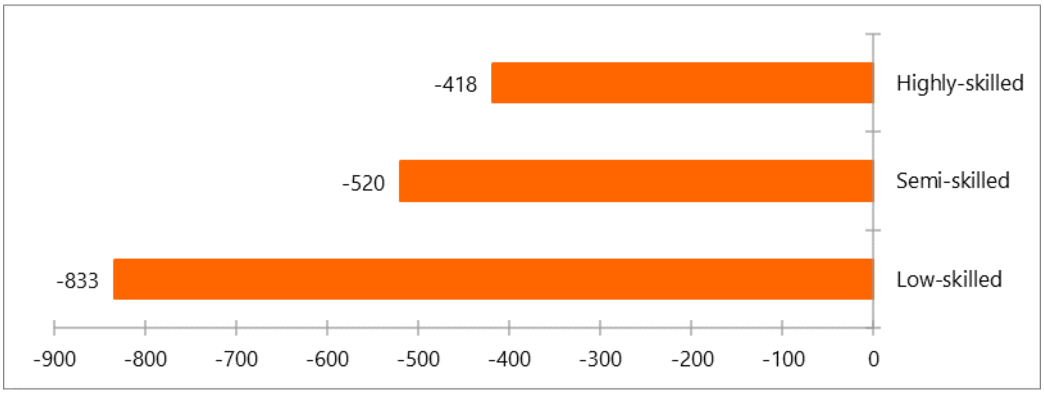
The principal impacts on Māori employment in Rotorua are forecast to take place in the industries that are expected to contract the most: accommodation and food services (-567 jobs), non-food manufacturing (-182), retail and wholesale trade (-180) and transport and warehousing (-167) industries. We have also taken into account that, within industries, Māori tend to be more likely to lose their jobs than non-Māori. The general age and skills profile of New Zealand's Māori and Pasifika populations tends towards high levels of both younger and lower-skilled employees, both of which are at greater risk of losing their jobs during a recession. With Maori and Pasifika populations also tending to live in lower-income households, the expected job losses will have a disproportionate impact on the district's vulnerable households.

Chart 12 Māori employment changes by broad industry, 2020-2021



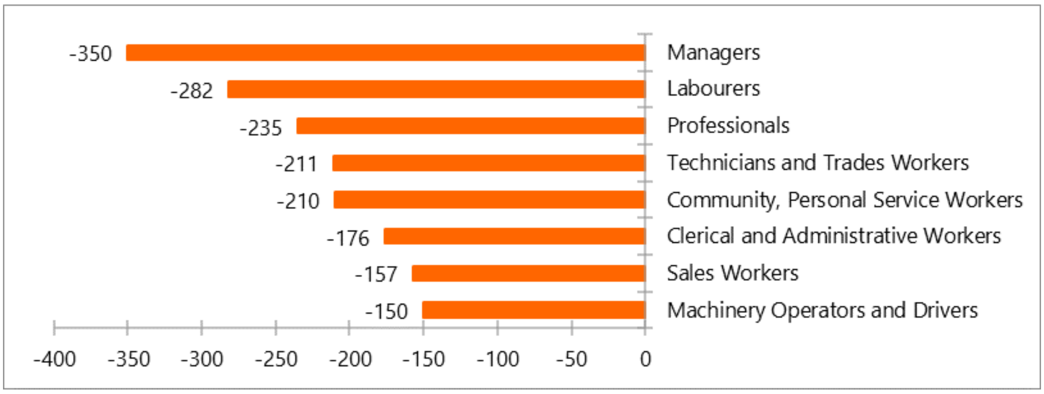
The largest declines in employment by skill level for Rotorua's Māori population are forecast to occur in low-skilled (-125 jobs) roles.

Chart 13 Māori employment changes by skill level, 2020-2021



Māori employment data is available only by ANZSCO Level 1 occupations. Based on this classification, the largest declines in Māori employment in Rotorua are forecast to take place amongst managers (-350 jobs), labourers (-282), and professionals (-235).

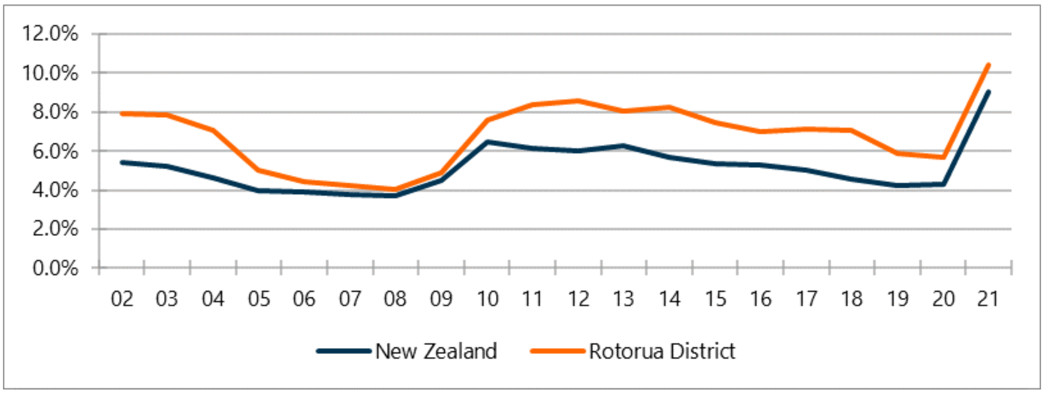
Chart 14 Māori employment changes by occupation, ANZSCO Level 1, 2020-2021



Job losses will push unemployment to 10.7%

Rotorua's overall unemployment rate is forecast to rise from 5.9% in the December 2019 quarter, to 10.7% in March 2021. This compares to a forecast national unemployment rate of 9.0% by March 2021.

Chart 15 Unemployment rate, 2002-2021

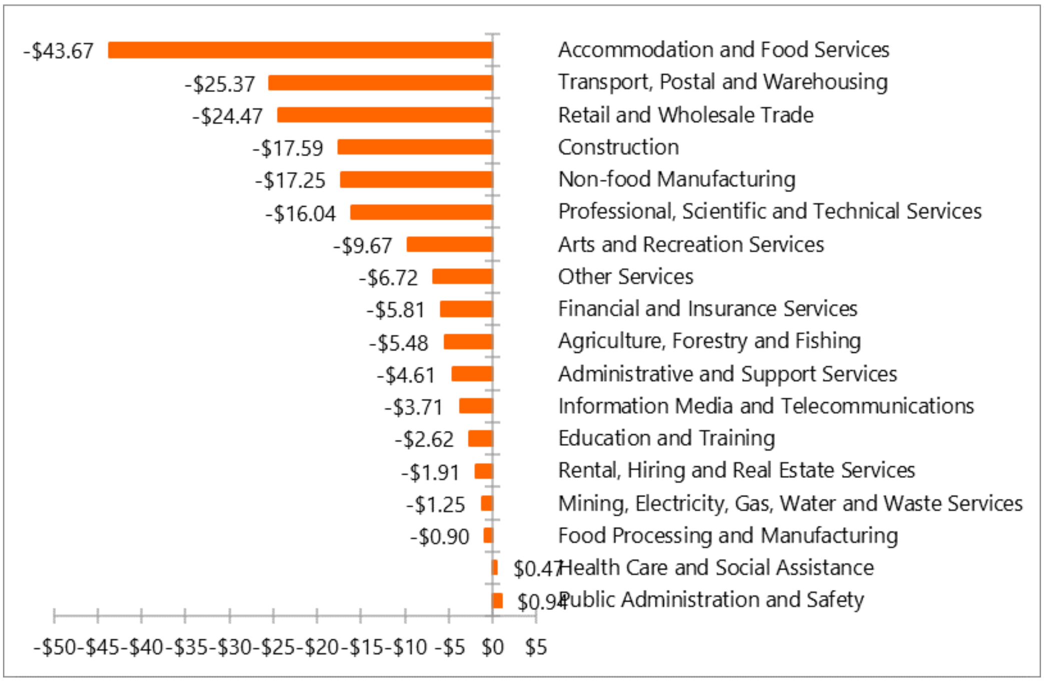


And result in lost earnings of $186m

We estimate that around $2031m was earned through wages and salaries in Rotorua in the year to March 2020[6] and this will decline by $186m to $1845m in the year to March 2021.

The largest declines in earnings are expected to occur in accommodation and food services (-$46m), transport, postal and warehousing (-$25m), retail and wholesale (-$24m), and construction (-$18m). As already noted, these reductions in earnings will have a disproportionate impact on lower-income, Māori and Pasifika households

Chart 16 Change in earnings by broad industry, 2020-2021 ($million)



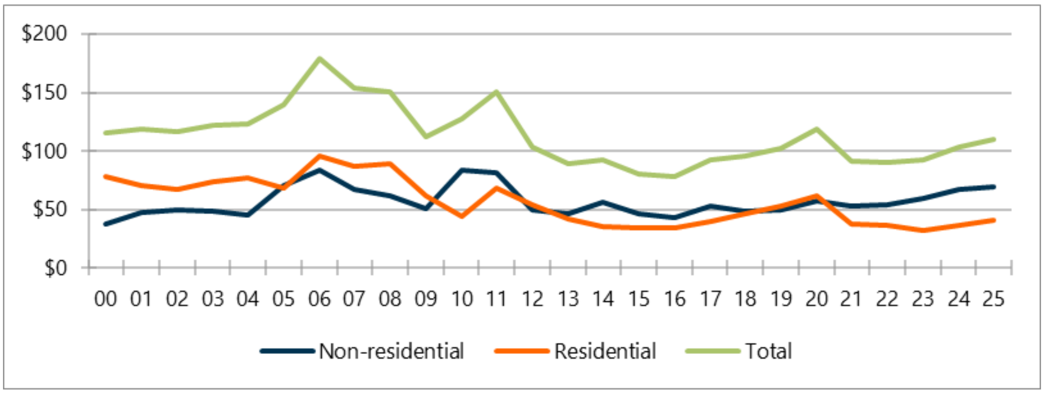
[6] In addition to wages and salaries, earnings include ovetime and lump sum payments.

Non-residential construction could support recovery in Rotorua

Infometrics expects residential construction activity in Rotorua to fall to its lowest level since our data series began in 2000. Soaring unemployment, a sudden termination of immigration, and falling house prices are set to slow new residential developments in their tracks. The Kainga Ora residential build programme may offer a boost to residential construction with the government committing to building 8000 new state houses over the next four to five years as part of the 2020 budget.

Prospects for non-residential construction are more positive, with the value of work put in place (in constant prices) rising from a low of just over $53m in the year to March 2021 to almost $70m in the year to March 2025. If the Rotorua Lakes Council's $210m bid to Crown Infrastructure Partners for seven "shovel ready' projects get the go-ahead this will offer a further boost to non-residential construction.

Chart 17 Real value of work put in place, residential and non-residential (2000-2025, 2009/10 prices)[7]



[7] Construction work put in place is a measure of construction activity expressed in dollar terms. Measured in 2009/10 prices, it is a measure of the volume of constration work, with the effects of inflation on the value of that work striped out.

Some thoughts on recovery

Housing affordability and lifestyle benefits can be assets

Over the next several years, recessionary conditions might give rise to increased levels of domestic migration. We anticipate that increased unemployment and high costs of living in the main urban centres, particularly Auckland, Hamilton and Tauranga, 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 relatively low house prices and an attractive lifestyle offering Rotorua could take advantage of any such increase in domestic migration.

Skills development and retention will be key

Job losses 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. The Government's commitment in the 2020 Budget to making trades training for critical courses such as building, construction and agriculture free for all ages over the next two years to help remove some of the financial hurdles facing people who've lose their jobs and want to retrain. Extra funding for initiatives such as He Poutama Rangatahi and Mana in Mahi will also help support vulnerable young people.

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) and Workforce Development Councils (WDCs), 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. An additional $3bn was committed to fund infrastructure projects in the 2020 Budget, on top of the $12bn committed earlier this year.

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 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

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 Rotorua 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 because of higher travel costs, some reluctance to fly, and the general economic downturn.

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[8] 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

[8] Stats NZ, Balance of Payments, spending on other personal travel services
https://www.stats.govt.nz/topics/balance-of-payments

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. Domestic travel may also be constrained post-Level 3 due to economic conditions.

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 Rotorua 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.