

Economic Impacts of the COVID-19 pandemic on the Marlborough District – Early Estimates

Marlborough District Council

May 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 Marlborough District.

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 that the economy will be fundamentally changed by this pandemic. The speed with which the economic outlook changed during March far exceeded anything experienced during the 2008/09 Global Financial Crisis.

Our modelling of the effects of the COVID-19 pandemic and the accompanying economic downturn are based on a number of assumptions, and include consideration of the government's policy responses.

Like the rest of New Zealand, the 4½-week Level 4 lockdown brought much of the Marlborough economy to a standstill. Consumer spending in the District declined by around 62% in the space of two weeks, traffic flows dwindled, and around 56% of the workforce was able to operate at Level 4. We estimate that at Level 3, this rose to 79%.

Marlborough is in the fortunate position that the 2020 wine harvest was authorised to take place. This is likely to be a key factor in the District's economic recovery over the next 12-24 months.

Despite the continuation of the harvest, we anticipate that the economic impact of COVID-19 for Marlborough will be substantial, even if marginally less severe than the overall impact on the national economy.

New Zealand's food-based primary sector exports are holding up relatively well, and Marlborough's wine and seafood production is likely to improve the District's economic resilience. However forestry-product exports, a key part of Marlborough's primary industries, are likely to see softer activity for a period.

Marlborough does also have some exposure to international tourism, with the tourism sector contributing 7% to the District's economy and 12% to employment. The wider tourism sector is expected to decline considerably as international arrivals remain at zero, although domestic tourism is forecast to hold up better. The tourism sector comprises varying levels of economic activity in the accommodation and food services, retail trade and transport industries.

We expect that the Marlborough economy will contract by 7.5% over the year to March 2021, with the largest impacts taking place in the manufacturing and transport industries. Both these industries are closely connected to wine production.

Approximately 2,600 jobs are expected to be lost, primarily in low-skilled roles, but also higher-skilled job categories. The overall local unemployment rate will rise to 8.2%.

Māori households are forecast to be worse affected than the average, with Māori employment declining by 13.2% in Marlborough. This decline is forecast to be concentrated in lower-skilled roles, particularly in the accommodation and food services industry.

Earnings across the Marlborough economy will decline by \$137m, with the largest impacts forecast in the accommodation, retail and transport industries. These earnings declines once again reflect in part the forecast decline in tourism in the District.

Lower consumer confidence, increased unemployment and reduced employment security is likely to decrease discretionary spending, further impacting the retail, accommodation and hospitality sectors.

The construction sector is forecast to decline in the near-term, but is likely to provide some support for economic recovery from 2023 onward, particularly in the non-residential segment.

The report concludes with some thoughts on economic recovery over the medium term. These include some discussion on the importance of skills development and infrastructure construction, and some recommendations on the role of local government in promoting recovery.

Many of the suggested measures have either been fully implemented in Marlborough, or are in the process of being introduced.

Table 1: Key Indicators

Indicator	Marlborough District	New Zealand
Change in consumer spending (week ending 12 April 2020 compared to same period 2019)	-56.5%	-55.9%
Change in heavy traffic (week ending 9 April 2020 compared to 1 February 2020)	-26.5%	-59.7%
% working at Level 4	55.9%	52.8%
% working at Level 3	78.5%	74.2%
GDP % change, year to March 2021	-7.5%	-8.0%
Job losses, year to March 2021	-2,646	-250,522
Employment % change, year to March 2021	-9.6%	-9.8%
Unemployment rate, March 2021	8.2%	9.1%
Loss in total earnings, year to March 2021 (\$m)	-\$137	-\$14,191
Residential construction % change, year to March 2021	-34.5%	-18.8%
Non-residential construction % change, year to March 2021	-5.5%	-18.3%

Introduction

This report provides an overview of the anticipated economic impacts of the COVID-19 pandemic on the Marlborough 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 regional construction outlook for the District.

The forecast analysis presented in the report draws on a suite of economic models maintained by Infometrics. Models are only as good as the assumptions they are based on, and we outline our key assumptions below.

This report is accompanied by a spreadsheet containing a set of data tables used in its preparation, as well as a set of additional insights including Infometrics' full national economic outlook and industry impacts.

The report is intended to provide evidenced-based information and analysis to Marlborough District Council and its key stakeholders, that can inform short-term responses to the pandemic and support long-term planning activities.

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 that the economy will be fundamentally 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 between the December 2019 and June 2020 quarters, with most of the decline occurring in the June quarter due to the current 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.

Our estimates are for the unemployment rate to 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 from 71% to 66%, its lowest level since 2001.

Our modelling is 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 remains constrained at Level 3** – 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** – we have allowed for a 16% contraction in non-food manufacturing exports volumes over the coming year, and a 9.5% reduction in international demand for unprocessed forestry exports such as logs.
- **Foreign tourism tanks almost completely** – we have estimated a 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 will drop** – after accounting for an increased pool of potential domestic spending due to a lack of international travel, we estimate a 21% decline in domestic tourism spending from the previous year.
- **International education revenue halves**– we have allowed for the number of international students at schools this year to be 79% of normal levels, and have included in our modelling a 49% reduction in international education revenue during 2020.
- **Domestic education demand will increase** – we have allowed for a lift in total demand for tertiary training 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, although 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.
- **Construction is also hard hit** – the housing market downturn will drag down the rate of new residential construction, while non-residential construction activity will also come under downward pressure. In contrast, prospects for civil construction are positive outside Level 4 lockdown conditions.
- **Government comes to the party** – we have thus far made allowances for two major government initiatives in our modelling, namely the 12-week wage subsidy scheme and the one-off increase in social welfare benefits of \$25 per week.

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

Lockdown's impact on the Marlborough economy

Like the rest of New Zealand, the 4½-week Level 4 lockdown brought much of the Marlborough economy to a standstill.

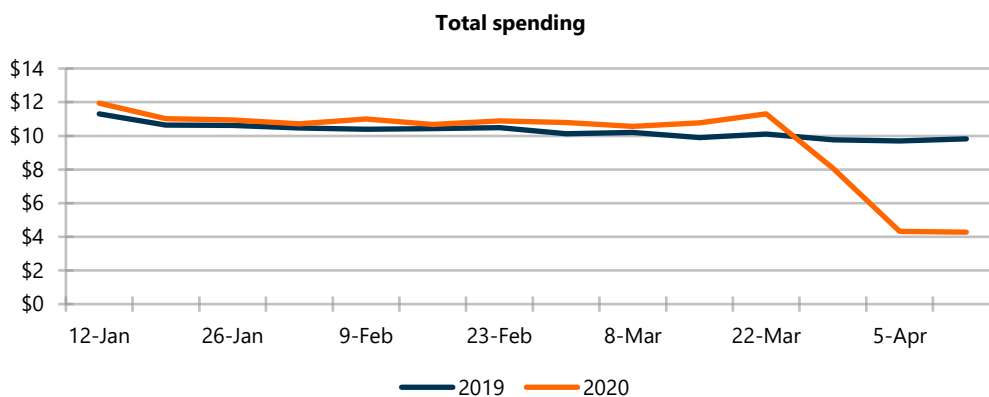
However Marlborough was in the fortunate position that the 2020 grape harvest could continue, as agricultural production was classified as an essential service.

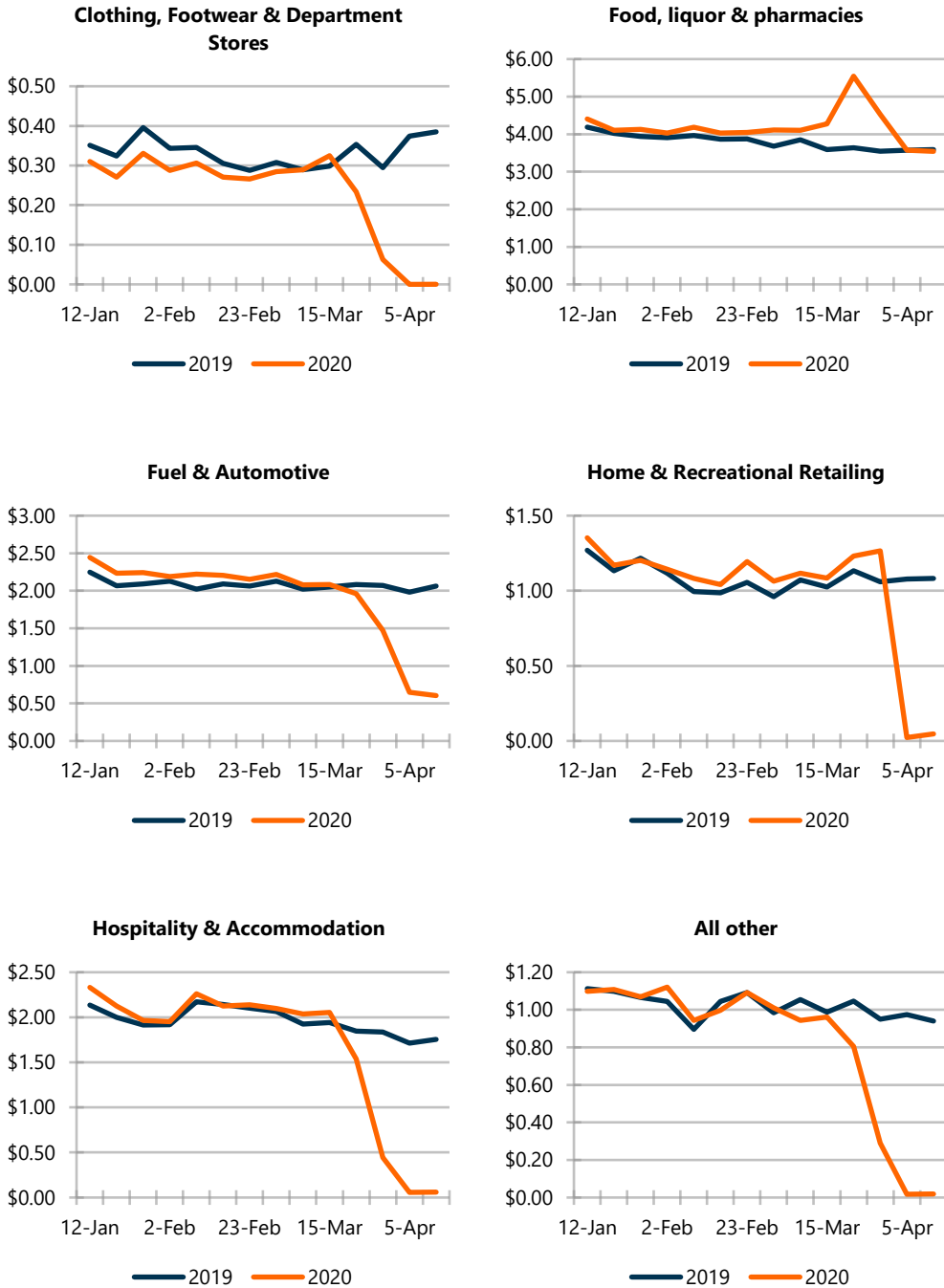
Consumer spending declined by 62%

Consumer spending in Marlborough increased somewhat in the lead-up to the lockdown. The loss of activity from Thursday 26 March took weekly spending down by around 62% over the following two weeks to Sunday April 5.

The only category in which spending stayed close to its 2019 level was food, liquor and pharmacies, with food sales and pharmacies amongst the essential services able to continue operating. Spending patterns across other areas of New Zealand have shown spending in the food, liquor and pharmacies category rising and remaining at a higher level than in 2019. Marlborough's return to usual levels of spending in this category point to a generally softer spending profile than in other parts of New Zealand.

Consumer spending (\$m)

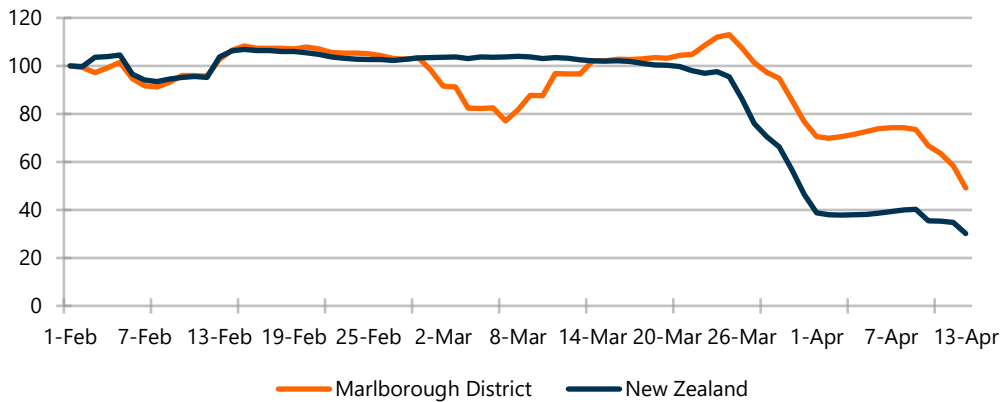




Traffic flows dwindled

According to data from NZTA, heavy traffic flows in Marlborough increase slightly prior to the implementation of the Level 4 lockdown, and then dropped sharply, as might be expected. Volumes in Marlborough did however drop less than the national decline – this is most likely a reflection of the District’s position as a road freight transit point on State Highway 1, as well as of the fact that the grape harvest was able to continue during Level 4.

Heavy traffic flows, Index, 1 Feb 2020 = 100

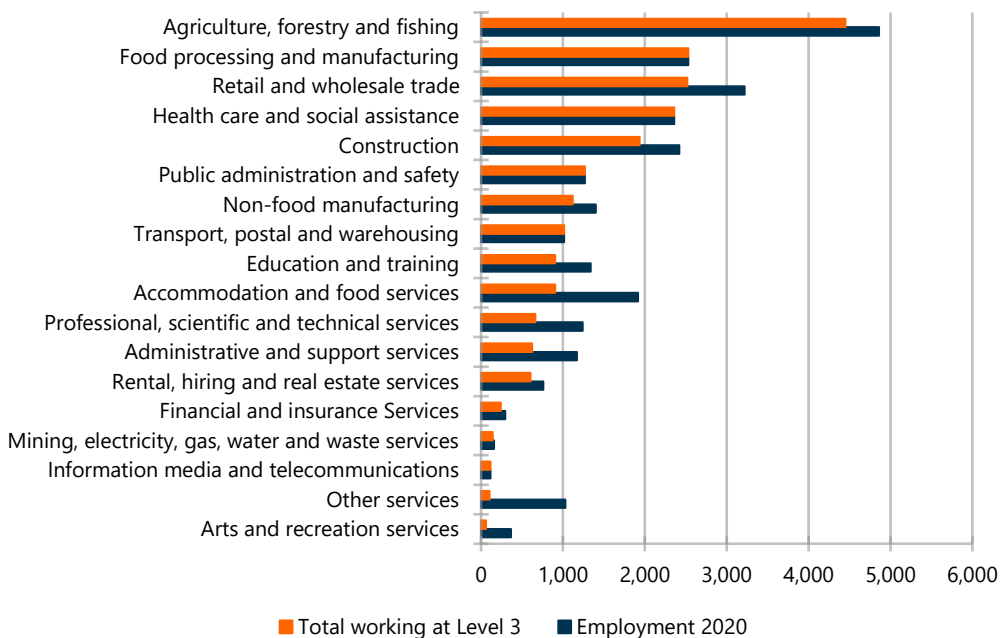


Around 79% of workers are operating at Level 3

We estimate that during the Level 4 lockdown, approximately 56% of the total Marlborough workforce was able to operate, either by working from home or being employed in essential services. Across the New Zealand economy, 53% of the workforce could work at Level 4. At Level 3, this working rate rises to 79% for Marlborough, slightly above the national rate of 74%.

More Marlborough workers have been able to operate at both Level 3 and Level 4 than the national average. This is once again likely reflective of the high percentage of Marlborough’s workforce engaged in the wine industry, with many of these workers being able to work throughout the lockdown.

Workforce operating at Alert Level 3



Marlborough sits in the middle of the pack

All districts and regions in New Zealand will be hard hit by the recession. The worst affected will be those districts heavily exposed to international tourism and international education, including Queenstown, Mackenzie, Westland, and Kaikōura.

By contrast, the least affected districts are those whose economies are dominated by the primary sector and with large food manufacturing sectors, including South Waikato, Western Bay of Plenty, Manawatū, and Tararua Districts.

Marlborough's economy relies heavily on the wine industry, which makes up close to 20% of GDP. Secondary industries, which include wine production (but exclude grape growing) and other manufacturing, make up close to 35% of the District's economy. This manufacturing sector focus means that we consider Marlborough as falling somewhere between the two extremes above.

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. Primary industries comprise around 12% of Marlborough's GDP. Continued primary export activity is therefore likely to support the District's economic recovery. Demand for non-food primary exports such as forestry products is however forecast to remain at lower levels.

Food production will continue

People continue to need to eat during a recession, which means that food production and manufacturing will not be as hard hit as the rest of the economy. In total, exports make up more than 45% to Marlborough's GDP, with the majority of these exports being wine and seafood products. This export performance is likely to prove vital to the District's economic resilience.

Marlborough does have some exposure to international tourism...

Tourism makes up 7% of Marlborough's GDP and 12% of employment in the District. We estimate that international tourism comprises 35% of total tourism spend in the District. Domestic tourism is forecast to hold up better than foreign tourism once conditions allow regional travel. We expect that domestic tourism spending will decline by 21% compared with a 91% drop in foreign tourism spending.

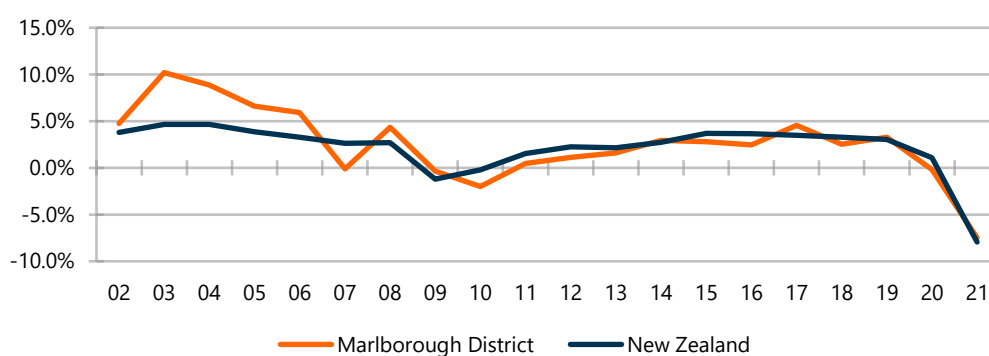
...but is not meaningfully exposed to international education

Only 0.1% of New Zealand's total complement of 100,000 international students are located in Marlborough. We therefore anticipate that the 49% decline in international education revenue will have a limited impact on the District.

Marlborough's economy will contract by 7.5%

The Marlborough economy is forecast to contract by 7.5% over the year to March 2021, comparable to a national decline of 8.0% over the same period. This contraction is close to four times the contraction of 2.0% experienced in Marlborough in 2010, following the GFC.

GDP Growth, 2002-2021



Manufacturing and transport will be most affected

The largest GDP declines are forecast to take place in the **Food processing and manufacturing** (-\$42.9m) and **Transport, postal and warehousing services** (-\$25.9m) industries. Both these declines are likely to be correlated to declines in demand for Marlborough wine. In the **Transport, postal and warehousing** industry, the decline is also likely in part related to generally lower freight volumes moving through the District.

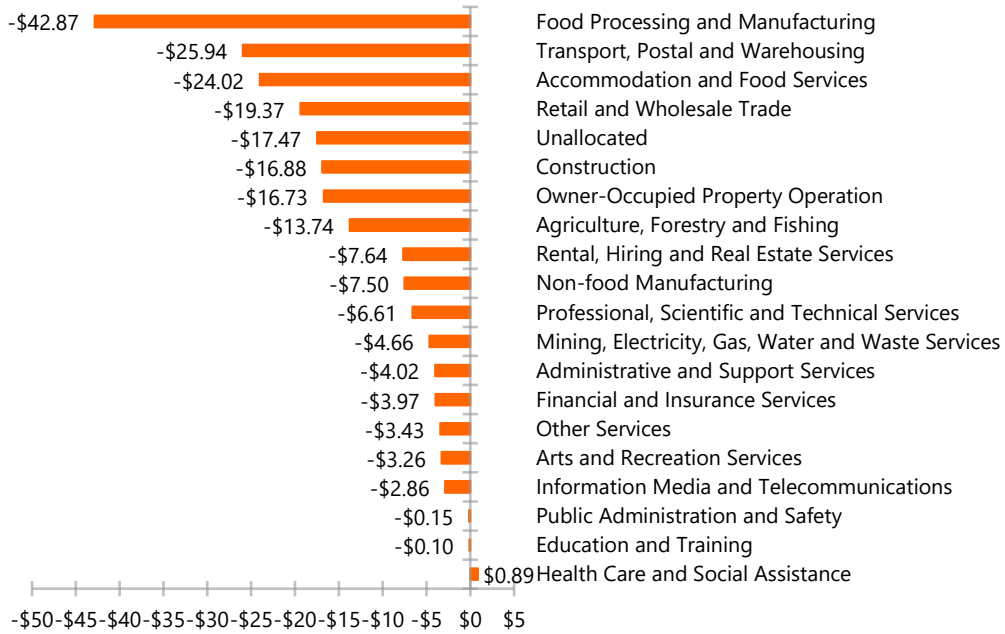
A generally softer local and international demand profile is likely to soften wine demand, as lower discretionary spending limits wine purchases globally. Premium wine is likely to be hardest hit, due to drastic declines in on-premises consumption in the hospitality sector. Off-site sales in the consumer retail market could well perform better, although household budgets will be more limited moving forward. Sales of New Zealand wine are generally tilted towards off-site retail, which might serve to limit the projected decline in demand.

The completion of the 2020 grape harvest will be a critical element of Marlborough's economic resilience. Even in a situation of softer global and local demand, the fact that the industry has a product to sell over the next 12 months is likely to support economic recovery in the District.

In addition, a substantial decline is forecast in the **Accommodation and food services** industry (-\$24m), which in part reflects the forecast decline in local and international tourism in the District. The main industries in which tourism spending takes place are **Accommodation and Food Services, Transportation** and various categories of **Retail Trade**.

On a slightly positive note, a small increase in GDP is forecast in the **Health care and social assistance** industry (+\$900,000).

GDP changes by broad industry, 2020-2021 (\$m)

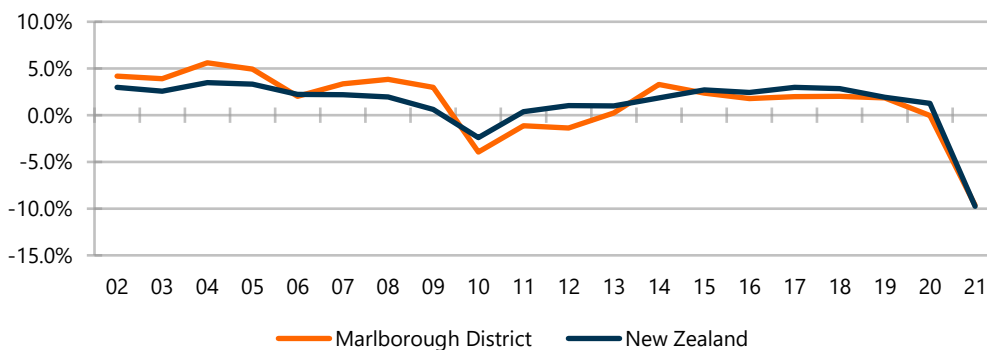


Detailed descriptions of the economic implications by broad industry across New Zealand are available in our supporting documentation.

Employment will shrink by around 2,600 jobs

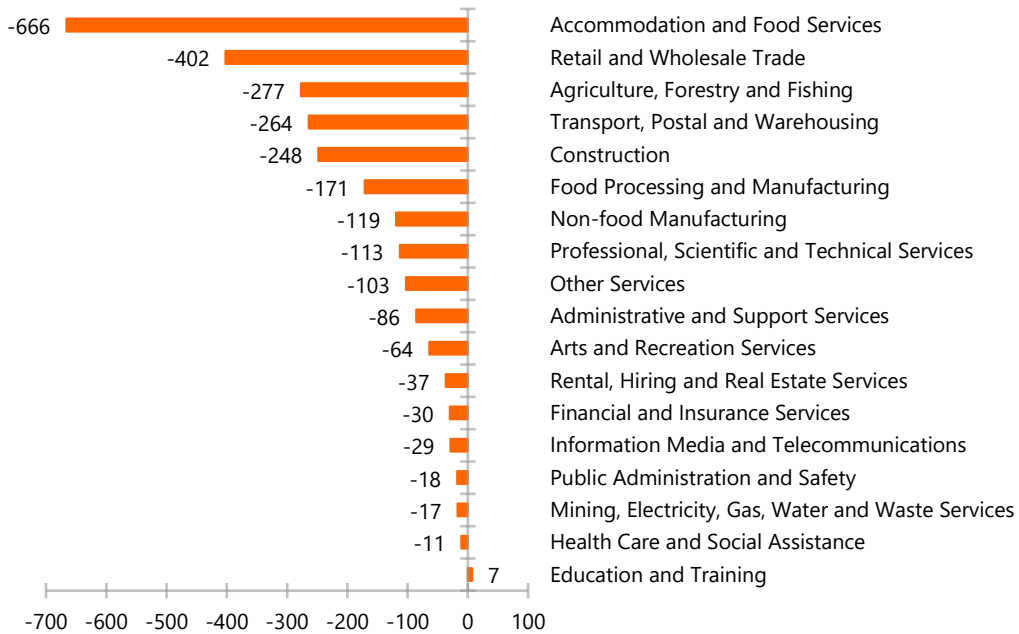
Total employment in Marlborough is expected to decline from over 27,400 in the year to March 2020 to approximately 24,800 in the same period to March 2021, a decline of close to 2,600 jobs, or 9.6%. This compares to a forecast economy-wide decline in employment of 9.8%.

Employment Growth, 2002-2021



The bulk of these job losses are forecast to be in the **Accommodation and food services** (-666 jobs), **Retail and wholesale trade** (-402) and **Agriculture, forestry and fishing** (-277) industries.

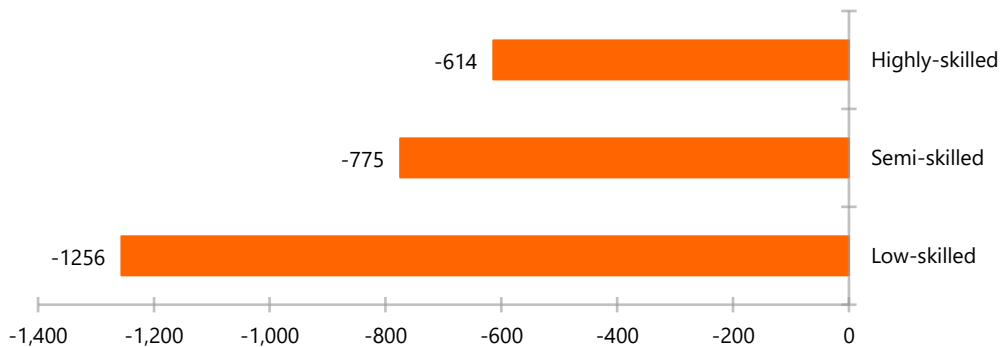
Employment changes by broad industry, 2020-2021



Low-skilled jobs will be worst affected

The highest number of job losses is projected to occur in **Low-skilled** (-1,256 jobs) roles.

Employment changes by skill level, 2020-2021



This correlates with the expected declines by occupation, with high levels of job losses projected for lower-skilled roles such as **Hospitality Workers** (-181 jobs) **Sales assistants and salespersons** (-169) and **Farm, forestry and garden workers** (-109).

Equally, job losses are expected in higher-skilled occupations such as **Specialist Managers** (-194 jobs) and **Hospitality, Retail and Service Managers** (-184).

The forecast employment declines in these occupations are consistent with reduced levels of activity in the tourism and wine industries in Marlborough.

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



But some jobseekers can move between industries

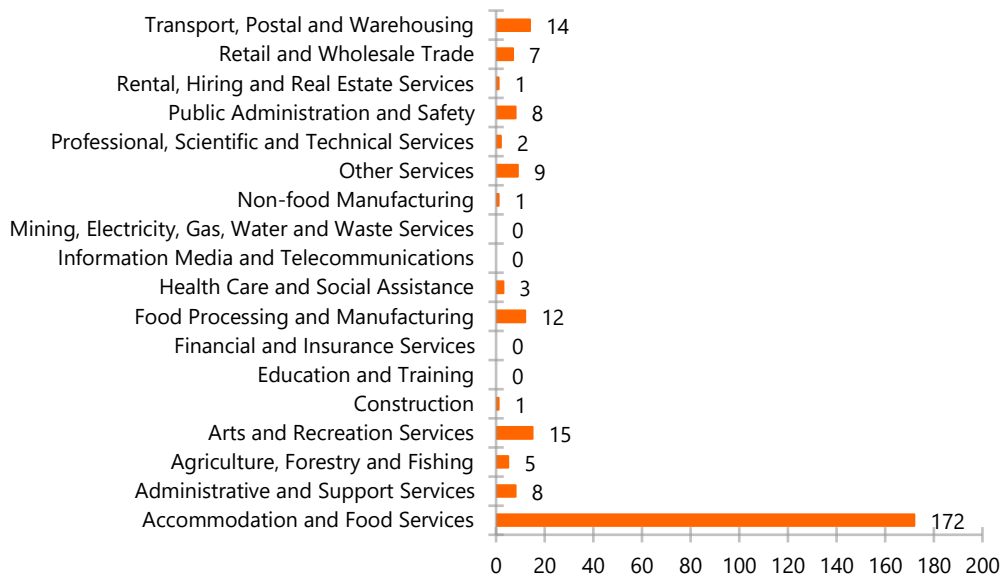
Certain occupations such as clerical and administration workers, machine operators and drivers, and labourers require relatively generic skills, which can allow workers in these occupations to move between industries. Here we analyse job losses in these occupation groups across industries to identify 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.

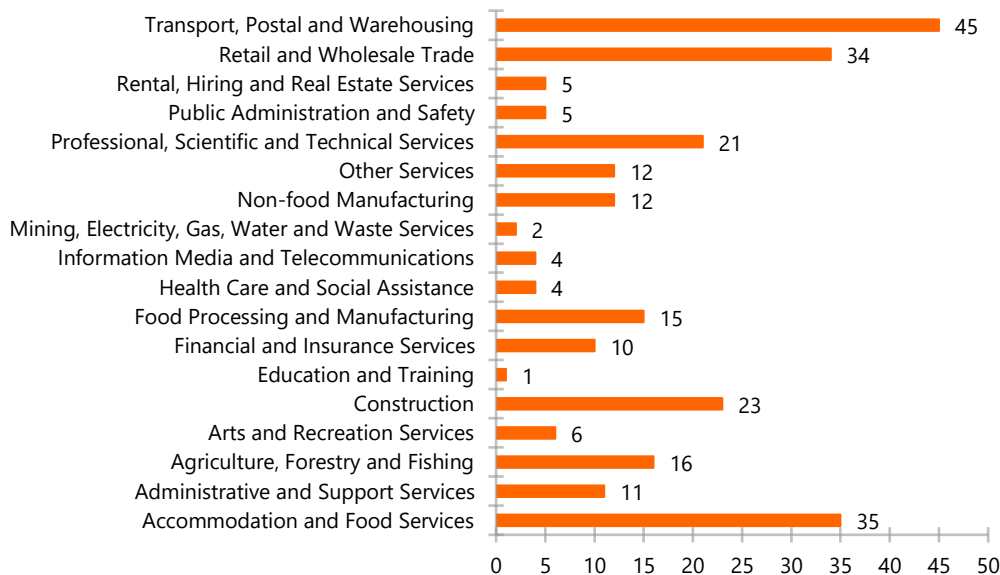
Previous modelling by Infometrics forecasts that Marlborough will have more than 1,000 replacement job openings in 2021. In coming years, we anticipate being able to identify opportunities for jobseeker mobility into these replacement roles, and into industries that are starting to recover.

In Marlborough, within the occupations described below, the industries that consistently display high number of anticipated job losses include **Transport, postal and warehousing, Accommodation and food services** and **Retail and wholesale trade**.

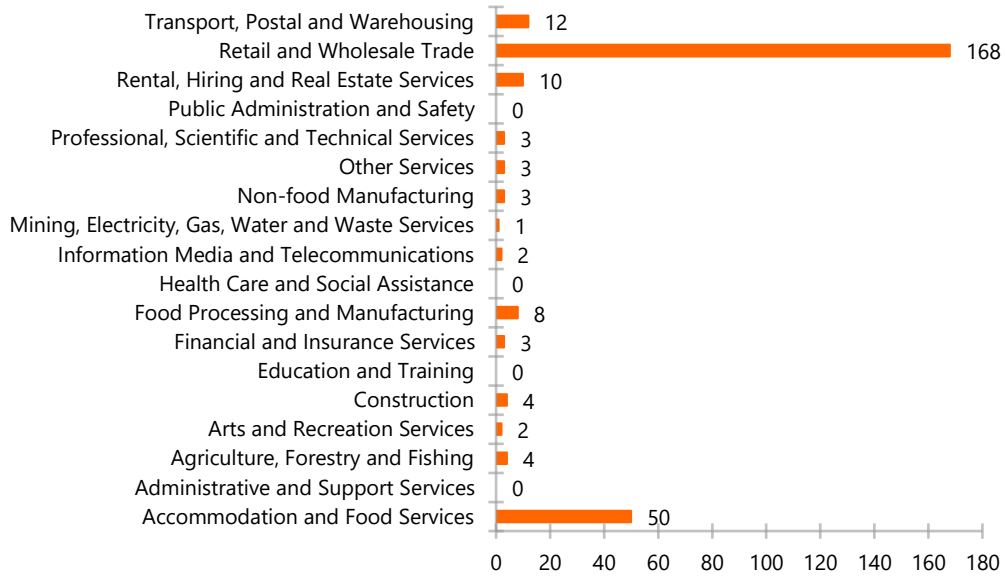
Job losses for 'Community and personal service workers' by industry, 2020-2021



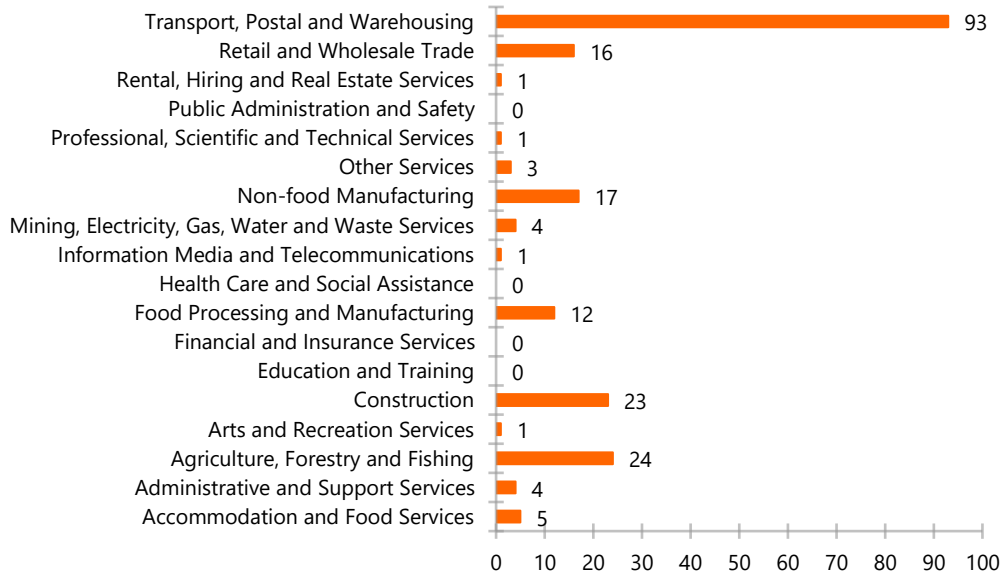
Job losses for 'Clerical and administrative workers' by industry, 2020-2021



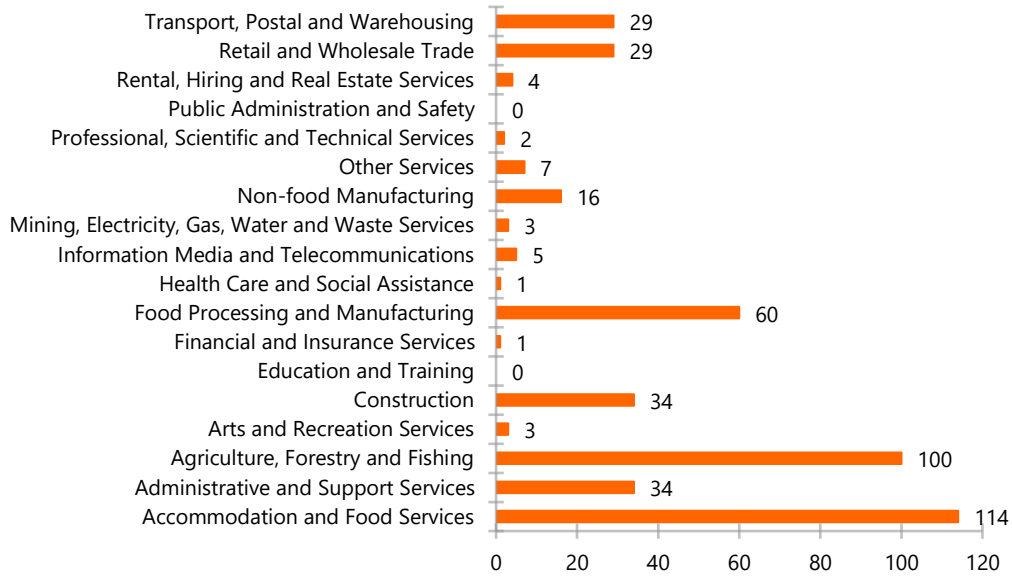
Job losses for 'Sales workers' by industry, 2020-2021



Job losses for 'Machine operators and drivers' by industry, 2020-2021



Job losses for 'Labourers' by industry, 2020-2021

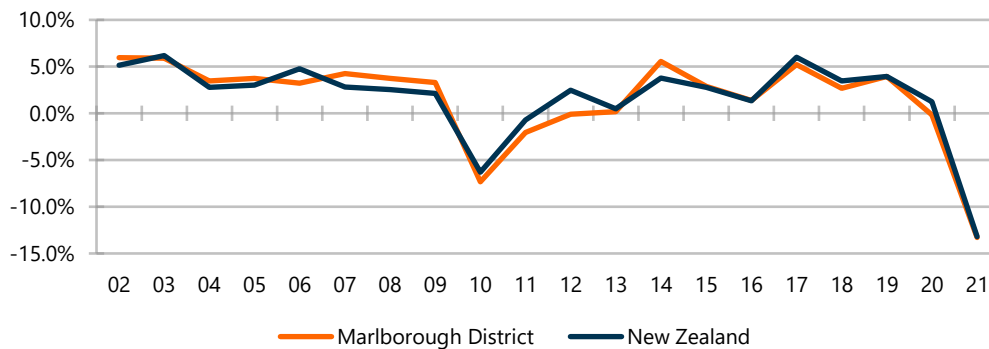


Māori households will be heavily affected

The general age and skills profile of New Zealand’s Māori and Pasifika populations correlates with high levels of both younger and lower-skilled employees. This suggests that employment declines may have a disproportionate impact in these communities. Our modelling therefore includes consideration of Māori job losses at rates similar to those that occurred during the GFC.

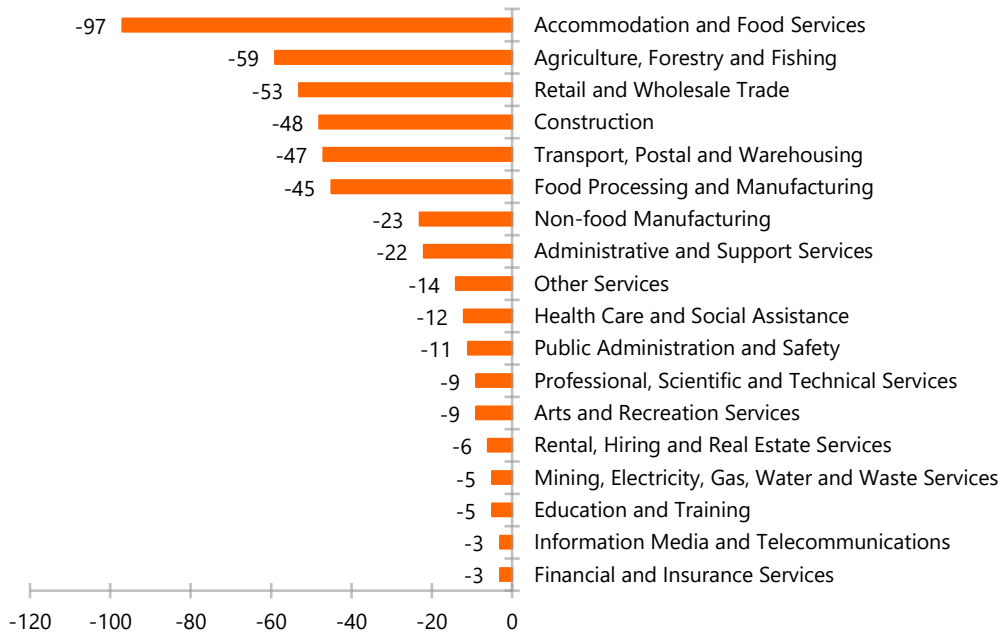
Overall Māori employment in Marlborough is forecast to decline by 13.3%, very similar to the national decline in Māori employment of 13.2%.

Māori Employment Growth, 2002-2021



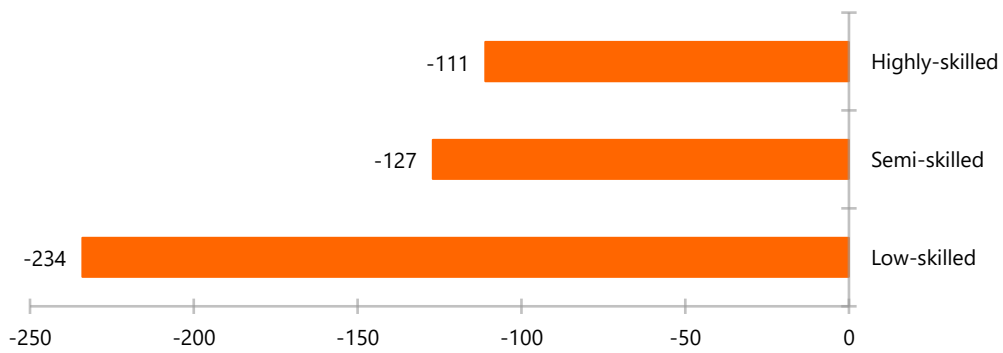
The declines in Māori employment in Marlborough are forecast to be concentrated in the **Accommodation and food services** (-97 jobs), **Agriculture, forestry and fishing** (-59) and **Retail and wholesale trade** (-53) industries.

Māori employment changes by broad industry, 2020-2021



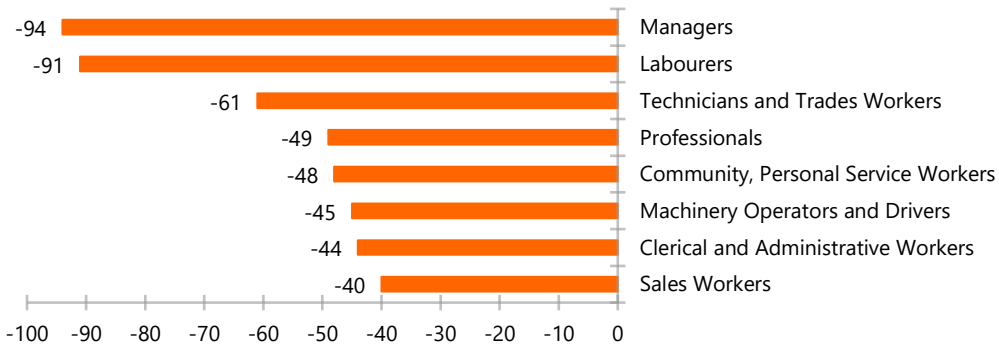
The largest declines in employment by skill level for Marlborough’s Māori population are forecast to occur in **Low-skilled** (-234 jobs) roles.

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 Marlborough are forecast to take place amongst **Managers** (-94 jobs), **Labourers** (-91) and **Technicians and trades workers** (-61).

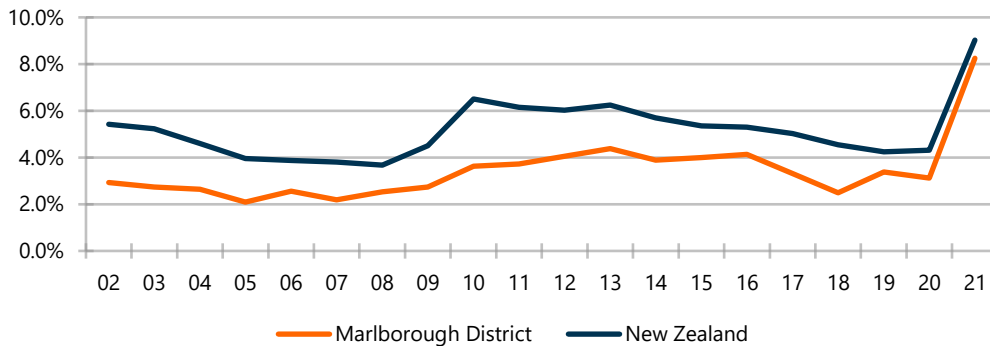
Māori employment changes by occupation, ANZSCO Level 1, 2020-2021



Unemployment will rise to 8.2%

Marlborough’s overall unemployment level is forecast to rise to 8.2% over the year to March 2021. This compares to a forecast national unemployment rate of 9.0%.

Unemployment



And result in lost earnings of \$137m

Earnings across the Marlborough economy are forecast to decline by \$137m in the year to March 2021. The largest declines are expected to occur in the following industries: **Accommodation and food services** (-\$21.2m), **Retail and wholesale trade** (-\$18.7m) and **Transport, postal and warehousing** (-\$17.7m).

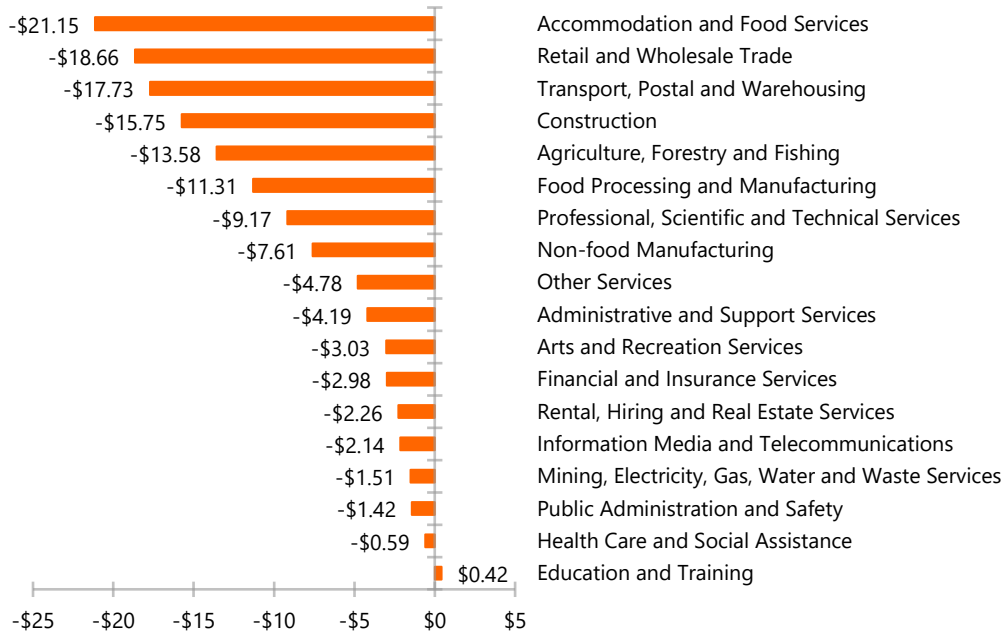
The earning declines in these industries are once again reflective of employment and revenue losses in tourism-related operations.

The decline in earnings also provides a (somewhat imprecise) indicator of future consumer spending in the District. The Infometrics economic outlook for April 2020, which is included in our supporting documentation, forecasts a 9% drop in private consumption in the June quarter.

Lower consumer confidence, increased unemployment and reduced employment security for many households is likely to lead to decreased discretionary spending, particularly outside of essentials such as food and housing costs. This is likely to further

impact industries such as **Retail and wholesale trade** and **Accommodation and food services**.

Earnings changes by broad industry, 2020-2021 (\$m)



Construction will provide some support in the medium term

According to the Infometrics Regional Construction Outlook, construction activity in Marlborough will decline overall until mid-2021, before stabilising and rallying slightly from mid-2023. Non-residential construction is forecast to increase from mid-2021 onward, while residential construction is set to decline until the middle of 2023, before showing slight signs of recovery.

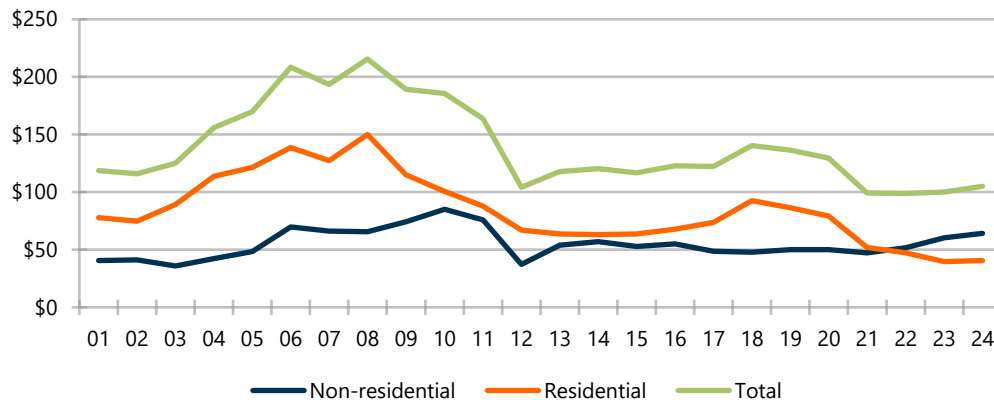
The forecast decline in residential construction activity during the year to March 2021 is in part due to higher than average levels of activity in the preceding two years.

The Infometrics Regional Construction Outlook is a measure of work put in place, and includes consideration of the value of residential and non-residential building consents issued on a quarterly basis. It is therefore an indication of future rather than current activity in the construction sector in any particular district or region.

While construction activity can resume at Level 3, physical distancing requirements and health and safety protocols are likely to impact productivity. In Marlborough, the construction industry is forecast to operate at close to full capacity through the next 2-3 quarters, as it seeks to make up for lost time and complete projects initiated before the lockdown. In the medium term, we expect the current high levels of construction activity to soften as a result of reduced demand under recessionary conditions.

Furthermore, this construction outlook does not include infrastructure construction. However, we anticipate that infrastructure spending will be a critical element of recovery for all districts including Marlborough.

Construction work put in place, real \$m (2009/10 prices), annual totals



Some thoughts on recovery

Housing affordability and lifestyle benefits can be assets

Over the next few years, recessionary condition might give rise to increased levels of domestic migration once the economic recovery begins. We anticipate that increased unemployment and high costs of living in urban centres might provide a competitive edge for regions offering lower property prices and high-quality lifestyle attractions. This trend 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, Marlborough 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 was the case 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, the New Zealand Upgrade Programme and possibly 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 any recovery

The Marlborough District Council, along with other key organisations in the region, will play a critical role in supporting local communities over the upcoming months and years. Some of the measures that the Council and its partners might consider include:

- Maintaining levels of operational expenditure and where possible accelerating already funded capital projects, to promote spending in the local economy
- Working to enhance local economic activity and supply chains, including through preferential procurement policies to support local businesses rather than those located outside the District (or even outside New Zealand)
- Increased investment in community development activities, particularly in vulnerable and highly impacted communities, with a focus also on volunteering opportunities to develop 'soft skills' for those seeking employment
- Highly localised destination marketing activities, aimed firstly within the District'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. A lower, but sustained, track of rates rises provides greater certainty to the economy than zero rates rises followed by a continued higher debt load or double-digit rates growth during the recovery phase.
- 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
- Coordination with key industries and business leaders to understand potential areas for additional employment through the recovery phase
- 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

Many of these measures have either been fully implemented in Marlborough, or are in the process of being introduced.

These and other actions, while unable to avert the inevitable unemployment increases and economic distress, can somewhat mitigate the worst impacts of the recession, increase the resilience of the Marlborough 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

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.

Measuring 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.