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BUDGET-SENSITIVE

Office of the Minister for Economic Development

Chair, Cabinet Economic Development Committee

A REFRESHED INDUSTRY STRATEGY IN RESPONSE TO COVID-19

Proposal

1 This paper proposes a refreshed Industry Strategy as part of the Government's economic response to COVID-19 and our Economic Plan. This paper seeks agreement to:

1.1 continue our active, partnership-led and tripartite approach to industry policy [DEV-19-MIN-0139 refers];

1.2 a cross-Government framework focused on:

1.2.1 supporting industries in transition (in response to both near-term disruption caused by COVID-19 and long-term challenges such as the shift to a low emissions economy); and

1.2.2 transforming industries to lift aggregate productivity and enable the scaling up of highly productive and internationally competitive clusters in areas where we have a comparative advantage;

1.3 identify cross-Government priorities for high-intensity and high-investment collaboration, such as through Industry Transformation Plans; and

1.4 a governance model in which the Economic Development Ministers Group plays a coordination and oversight role across sector work programmes in conjunction with portfolio Ministers.

Relation to government priorities

2 This paper supports the government's goal to improve the wellbeing and living standards of New Zealanders by building a productive, sustainable and inclusive economy [CAB-18-MIN-0111 and DEV-18-MIN-0222 refers].

3 An active and coordinated industry policy delivered in partnership with industries is a key mechanism for effectively responding to the economic impacts of COVID-19 and delivering on our Economic Plan [DEV-19-MIN-0244 refers].

Executive Summary

4 In 2019, Government launched an Industry Strategy as a key pillar in progressing the Government's Economic Plan for a more productive, sustainable and inclusive economy. The Strategy sets out a partnership-led, tripartite approach to industry policy through the development of Industry Transformation Plans (ITPs), with a particular focus on driving productivity growth by moving from volume to value. Work is underway on the first five ITPs.

5 COVID-19 has had huge economic and labour market impacts, dramatically changing the context for the Industry Strategy. The impacts are deep and wide-ranging, and vary significantly for different sectors. Whilst there is significant disruption across the economy, the recovery ahead also presents an opportunity to reshape the economy to drive towards our long-term vision set out in our Economic Plan, to address our longstanding productivity issues and to lift the collective wellbeing of New Zealanders.

6 Our active, partner-led, and coordinated approach to industry policy is a key mechanism for effectively integrating our short-term response to the economic impacts of COVID-19 with our long-term objectives for the economy. I am therefore proposing a refreshed, broadened Industry Strategy focussed on two core outcomes (the full framework is attached as **Annex One**):

6.1 supporting industries in transition (in response to both near-term disruption caused by COVID-19 and long-term challenges such as the shift to a low emissions economy); and

6.2 transforming industries to lift aggregate productivity and enable the scaling up of highly productive and internationally competitive clusters in areas where we have a comparative advantage;

7 The focus on transforming industries to lift aggregate productivity and enable the scaling up of highly productive and internationally competitive clusters based on New Zealand's comparative advantage reflects our analysis of the drivers of New Zealand economic growth, including the recent report by David Skilling *Frontier Firms: An international small advanced economy perspective* prepared for the New Zealand Productivity Commission (**Annex Two**).

8 Active industry policy is a high-engagement and resource-intensive process. This means we need to focus on sectors of the economy where we can make the most difference in achieving the aims in paragraph 6. I propose two tiers to our industry policy:

8.1 a broader set of eleven sectors of focus across the Industry Strategy framework based on an assessment of sectors' significance, performance and role in economic recovery, and long-term transformation;

8.2 a narrower set of sectors that are well-positioned for and will benefit from a high-intensity and high-investment approach where we consider a sector could become a highly productive and internationally competitive cluster of businesses.

9 I propose that this narrower set of sectors consists of digital technologies, advanced manufacturing, and parts of the food and fibre sector. Helping these sectors transform will be key priorities for me under the Economic Development portfolio.

10 In working with industries the principles of the existing Strategy (including a partnership-led sector-specific approach, guided by evidence, leveraging international connections, and supporting better jobs) remain core to this refreshed Industry Strategy. I am proposing additional principles to recognise our particular obligations under Te Tiriti, the importance of aligning short-term action with long-term objectives, and the importance of aligning the Industry Strategy with our environmental sustainability objectives.

11 Many of these sectors have existing work programmes led by the portfolio Minister. I propose the Economic Development Ministers Group take the overall lead governance role for the Industry Strategy and assist with coordinating across these industries. A Tripartite Oversight Group will also enable our Future of Work Tripartite partners to provide advice and oversight across the Strategy.

12 Funding will be required for engagement with stakeholders, and for development and implementation of sector plans. Some agencies have already received funding through Budget 2020 or the COVID Response and Recovery Fund (CRRF). However, additional funding will be needed across many of the focus sectors to enable recovery and transformation work programmes and to deliver on the aspirations of the Industry Strategy and the Economic Plan.

Background

13 On 13 October 2019 the Minister of Finance and I launched the Government's Economic Plan to transition the economy to be more productive, sustainable and inclusive and to tackle New Zealand's long-term challenges. The inclusion of productivity is a recognition of one of this country's most significant and persistent issues.

14 Over the last 30 years, New Zealand has experienced productivity growth that is low by international standards and GDP growth has been largely driven by increases in (mainly labour) inputs rather than improved labour productivity. In order to drive improvements to our wellbeing, we need to move from a growth strategy based on labour absorption to one powered by productivity gains.

15 Some of the factors contributing to our poor productivity performance include a small domestic market, geographic isolation, a lack of large firms competing internationally, shallow capital markets, lack of domestic competition, and lack of international connections. These provide genuine challenges, but are not unique to New Zealand. Other small advanced economies have navigated similar challenges to deliver strong productivity growth.[1]

16 In recent decades our policy focus has been on ensuring strong system settings and efforts to lift aggregate productivity. However, despite being acknowledged globally for having generally strong policy foundations, this has not been sufficient to lift our productivity performance.

17 Recognising that system settings alone are insufficient to deliver the vision of the Economic Plan, the Government developed a new Industry Strategy with a focus on taking an active industry policy approach to grow innovative industries, and shift sectors from volume to value.

18 The Industry Strategy is being delivered through the development and implementation of Industry Transformation Plans (ITPs) in partnership with industry [DEV-19-MIN-0139]. The intention of the ITP process is to bring together all relevant parties around an industry to agree a long-term vision for the industry and identify the actions that can be taken by industry, government and others to realise this vision.

[1] Recent examples of analysis of this issue include *Frontier firms: An international small advanced economy perspective* by David Skilling, and *Can the Kiwi fly? Achieving Productivity Lift-off in New Zealand* by Paul Conway, as well as a significant body of work from the New Zealand Productivity Commission.

19 In this way we can develop and strengthen individual industries and the interconnected industries and systems that support them and encourage the growth of internationally focussed and competitive firms that will drive productivity and flow-on benefits to the supporting ecosystem.

COVID-19 compounds these long-term challenges

20 COVID-19 has had huge economic and labour market impacts, compounding many of our long-term challenges, and changing the context for the Industry Strategy:

20.1 The impacts of the lockdown on our economy are acute, and despite strong levels of government support, there will be significant firm closures and job losses as a result. Groups of workers already disadvantaged in the labour market are likely to be particularly impacted.

20.2 Ongoing social distancing requirements and border restrictions will continue to impact on business operations and consumer behaviour for the foreseeable future and certain industries will be faced with an unavoidable decline, at least in the short term.

20.3 Border and travel restrictions also mean that supply chains (for both imports and exports) and our access to markets will be constrained for an indeterminable length of time.

20.4 Globally, the economic impact is likely to result in worldwide recession. This means that even where access to markets can be restored, most New Zealand firms will be facing reduced demand, breakdown of supply chains, reduced appetite for investment, and overall more insular foreign markets.

20.5 Uncertainties across a wide range of areas exist and will continue for some time, making business operation and investment decisions difficult, but also complicating policy decisions.

20.6 Growth opportunities are emerging for some sectors, either for addressing challenges related to COVID-19 (e.g. health technologies) or as a result of New Zealand's relative success in managing the outbreak of the virus.

21 These impacts are deep and wide-ranging, and are impacting on sectors in different ways, with some facing huge immediate threats, some facing significant obstacles that will inhibit growth and progress towards sustainability and inclusivity goals, while for others opportunities are emerging amidst the crisis.

Though our immediate context has changed, our long-term vision has not

22 The aim of our response, recovery and rebuilding efforts is not to simply return our economy to where we were pre-COVID-19. We must continue to move towards the vision articulated in our Economic Plan of an economy that is more productive, sustainable and inclusive and that contributes more to the collective wellbeing of all New Zealanders. We need to respond to these near-term disruptions in a way that aligns with our long-term goals.

23 Our Industry Strategy must extend beyond our previous areas of focus, to account for industries that are heavily disrupted and need support to reset, or where industries may not be strong drivers of growth, but are critical enablers of activity in our

economy and need support to transition to more sustainable ways of operating, including decarbonisation, in order to remain resilient enablers in the future.

24 This active industry policy must also not lose sight of the need to vastly improve our productivity performance, both near and long term. We will not achieve the growth our economy needs with incremental changes; meaningful transformation is needed. As a small open economy, we must build from and strengthen bases of competitive advantage, work in partnership with our industries and support them to scale up, increase productivity and internationalise.

25 Therefore, our refreshed Industry Strategy will have two main objectives: supporting industries in transition, and transforming industries to lift productivity for New Zealand as a whole.

26 To achieve these objectives we must agree our sectors of focus, where there is highest need for transition and greatest potential to contribute to the future economy we desire, and we must align our policy levers and resources to these industries to realise that transformation. ITPs remain a key part of this approach, but are not our only delivery mechanism.

A refreshed Industry Strategy framework

27 I propose a cross-government Industry Strategy Framework to align our efforts for active industry policy. This framework acknowledges the need in our current context to balance response and recovery with economic transformation. It provides a common view of the needs and/or role of a sector in our economy, taking account of both near-term and the long-term objectives, as well as the interventions that may be used to further those objectives.

28 The framework identifies two categories of industries based on two core outcomes for industry policy: managing transitions, and lifting productivity and shifting our economy from volume to value. There are sub-categories under each that account for more nuanced differences in core objectives (and interventions) for industries.

29 The framework is summarised here, and the full framework can be found as **Annex One**.

29.1 Managing Transition

29.1.1 Resetting

These are sectors that have been heavily impacted by COVID-19 and are likely not viable in their current form in a post-COVID-19 environment. They are facing a decline, or need significant re-shaping.

Interventions for these sectors will focus on helping sectors navigate reduced demand and opportunities, pivot towards viable target markets, and provide pathways for firms and workers. For example, active labour market programmes, or in some cases where the sector is concentrated in a region, a place-based transition strategy approach may be appropriate.

29.1.2 Strengthening Resilience

These are strategically important sectors that may not be significant drivers of growth, but are critical enablers for the effective and efficient functioning and resilience of the economy. These sectors need to be strengthened and/or transformed to be more productive, sustainable,

inclusive and resilient to future shocks, including for example climate change, natural hazards or pandemics. In particular, these sectors face significant transitions to improve environmental sustainability and/or reduce emissions.

Interventions for these sectors will focus on ensuring these sectors continue to enable the economy in a way that protects our environment, supports the transition to a low emissions future, and provides good jobs for our people. For example, support for research and development and identifying emissions reduction pathways, leveraging government procurement and investment to provide certainty and long-term confidence.

29.2 Driving productivity

29.2.1 Moving from Volume to Value

These are sectors that are currently significant employers and exporters in our economy, with opportunities to move towards the international productivity frontier, move up value chains, and to improve sustainability and inclusivity of outcomes. These sectors have strong potential to drive economic recovery in the near-term and have significant potential over the longer-term to move from volume to value.

Interventions for these sectors will focus on facilitating and encouraging shifts from volume to value in a way that is more environmentally sustainable, supports the transition to a low emissions future, and provides better quality jobs with higher pay. For example we will look to strengthen international links, develop complementary services and sectors, support innovation and R&D, investment in enabling technology and the upskilling of workers.

29.2.2 Scaling up value

These are high value sectors with potential for building on competitive advantage, and that will support a more productive, sustainable, inclusive and resilient economy of the future. These sectors may not currently be large employers, or of large enough scale that they would be immediate drivers of near-term economic recovery. However, support for these industries now is an investment in a future diversified, resilient, knowledge intensive, and high-value economy.

Interventions for these sectors will focus on developing an enabling environment to allow for the sustainable growth of firms and high-value jobs. For example we will seek to support R&D, market access and internationalisation while addressing capital constraints, and skills shortages.

30 In categorising sectors into this framework, officials brought together evidence for a broad range of sectors across the economy. For each sector they outlined its significance and performance, including social and environmental factors; considered the unfolding impacts of COVID-19; and identified the emerging outlook for the sector considering possible opportunities and challenges. The evidence base is included at **Annex Three**.

31 Some sectors may not fit neatly it into a single category, and parts of sectors could fall within different categories. Sectors have been placed into a category based on a view of the objectives for the sector as a whole looking to the future. Lead agencies

and Ministers will have the scope and flexibility to target their efforts within these broad sectors.

32 A range of levers and tools are identified within the framework. The specific levers and tools used will vary depending on the needs of the sector but may include: active labour market programmes, targeted trade policy, addressing regulatory issues, investment support, government procurement, emissions reduction pathways, capability building, and/or tax measures (e.g. accelerated depreciation). The appropriate actions and initiatives for each specific sector will be identified and developed in partnership with industry.

33 In applying this framework and using an active industry policy approach, we will also consider the spatial impacts of our work, as well as the intersect between sectoral and regional approaches to economic transitions and transformation more broadly.

Driving meaningful transformation requires us to focus our efforts

34 The scale of what we're trying to accomplish is significant and our support and investment must match that ambition. Active industry policy is a high-engagement, high-investment process, and achieving meaningful transformation will require substantial investment for each focus sector. This means we must focus our efforts on sectors of the economy where we can make the most difference in achieving the core outcomes of this Industry Strategy.

35 I propose two tiers to our industry policy:

35.1 a broader set of sectors of focus across the Industry Strategy framework based on an assessment of sectors' significance, performance and role in economic recovery, and long-term transformation;

35.2 a narrower set of sectors within this (marked with an asterisk in the table below) that are well-positioned for and benefit from a high-intensity and high-investment approach where we consider a sector could become a highly productive and internationally competitive cluster of businesses.

36 I propose the following focus sectors under this refreshed Industry Strategy:

Focus sector	**Categorisation**	**Lead agency**	**Lead portfolio**
Managing transition			
International education	Resetting	MOE / Education NZ	Education
Tourism	Resetting	MBIE	Tourism
Energy and resources	Strengthening resilience	MBIE	Energy and Resources
Transport and logistics	Strengthening resilience	MOT	Transport
Driving productivity			
Construction	Volume to value	MBIE	Building and Construction
Advanced manufacturing*	Volume to value	MBIE	Economic Development

Food and Fibre *Primary* *Food and beverage manufacturing** *Forestry and wood processing** *Agritech**	 *Volume to value* *Volume to value* *Volume to value* *Scaling up value*	 *MPI* *MPI* *Te Uru Rākau* *MBIE*	 *Agriculture* *Agriculture* *Forestry* *Economic Development*
Digital technologies*	Scaling up Value	MBIE	Economic Development

* denotes the narrower set of sectors for a high-intensity, high-investment approach (e.g. ITP)

37 I note when looking across this set of focus sectors, it presents a balanced approach to industry policy in the context of our overall economic recovery and rebuild in response to COVID-19 and longer-term. In recommending these sectors, I have sought to:

37.1 balance sectors that are heavily disrupted, such as tourism or international education, with those capable of growing and providing employment, for example our manufacturing sectors;

37.2 balance the need for immediate drivers of recovery, such as construction or the primary sector, with the long-term growth of sectors that will hold potential as economic drivers and employers in the future, including digital technologies and agritech;

37.3 account for how sectors interplay and enable each other, including broad enablers like energy and resources, and transport and logistics, but also sectors with important direct links to one another, for example agritech supporting our primary sectors; and

37.4 support current focus areas and areas of aspiration for Māori, iwi and whānau, such as food and fibre, and digital technologies; as well as for Pacific peoples, for example food and beverage manufacturing.

38 I acknowledge that sectors that have not been identified as key focus areas within this Industry Strategy are important for our economy and our society. The Government is committed to supporting all New Zealand businesses, workers and households through this crisis. We have set in place a comprehensive foundation of support for all businesses (including SMEs) and workers to cope with the disruption caused by COVID-19.

39 We must also be agile in our approach as we manage significant uncertainties and must adjust to new challenges and be alert to emerging opportunities. Areas of focus will be revisited in the future and options for future focus sectors under Industry Strategy will be determined through consultation with social partners and additions or changes agreed by Cabinet.

Focus sectors: Managing transitions

40 I propose that with respect to managing transitions, we focus our efforts on four sectors: international education, tourism, transport and energy and resources.

41 I note there are significant work programmes underway or being shaped with and for these focus sectors, both in responding to impacts of the current crisis, and progressing longer-term transitions. This work is aligned with the Industry Strategy and our relevant ministerial colleagues will continue to lead and be responsible for

delivering these work programmes. The value of bringing these within the frame of the Industry Strategy rests in supporting coordination across all focus sectors and ensuring alignment with, and prioritisation through, other cross-cutting work programmes.

42 International education and tourism, being reliant on international travel have been heavily disrupted by COVID-19 and have required immediate response and recovery support. Lasting recovery in these sectors is only likely once border restrictions are loosened and travel resumes. The current crisis has also reemphasised that the previous industry structures and operating models in these sectors were unsustainable, both from an industry and environmental perspective. The goal of recovery and rebuild in these sectors cannot be to return to 'business as usual' but to reset and reshape the sectors to provide good jobs and build a sustainable future for these industries.

43 These sectors each have long-term strategies underway to provide direction for long-term and short-term support. The International Education Strategy 2018-2030 continues to provide strategic direction for the international education sector and the Minister of Education is developing a *Recovery Plan for International Education* Cabinet paper. The Minister of Tourism is progressing a Tourism Response package and Tourism Recovery Fund that focuses on both providing immediate support to the Tourism sector and the need for rethinking the future shape of tourism in New Zealand, including the establishment of the New Zealand Futures Tourism Taskforce

44 The transport sector is also a critical enabling sector in the economy, and has been heavily impacted by COVID-19 – with these impacts differing across sub-sectors and regions. The sector has a central role in contributing to New Zealand's economic recovery, through preserving access to international markets, maintaining core transport networks, and investments that may stimulate activity through the recovery phase. Longer-term transformation in the transport sector, including decarbonisation, also plays a key role in our ability to progress our economy towards our productive, sustainable and inclusive vision. The Ministry of Transport is preparing a recovery programme for the Transport sector that addresses near-term recovery needs, and acknowledges the need to take opportunities to shape the future of the sector.

45 The energy and resources sector is critical to the functioning of our economy, and our progress towards decarbonisation. The sector has been less disrupted by COVID-19, given its essential status, but faces a continuing and significant transition to increase renewable energy and decarbonise. A significant energy and resources sector work programme is underway to address these issues, including consultation on the Accelerating Renewable Energy and Energy Efficiency discussion paper, review of the Crown Minerals Act, the refreshed minerals and petroleum resources strategy, and the Just Transitions work programme.

Focus sectors: Driving productivity

46 The second core objective under this framework is lifting our long-term productivity performance through sectors where New Zealand has an identified competitive advantage. This builds from the foundation set out in our original Industry Strategy – building comparative advantage and moving from volume to value in our existing, adjacent and emerging sectors.

47 A notable difference between New Zealand and small advanced economies that have achieved better productivity growth is the prevalence of large, internationally connected firms. While, on the whole, small advanced economies have a relatively high number of Forbes Global 2000 companies per capita, New Zealand has none

(though several of our largest firms are not listed companies). Only 1.7 percent of New Zealand enterprises (excluding those with zero employees) have more than 100 employees. In comparison, in Europe firms with less than 250 employees are considered only a medium-sized firm.

48 My priority for this second group of industries is on transformation that will lift aggregate productivity and enable the scaling up of highly productive and internationally competitive firms. This focus is based on analysis of the drivers of New Zealand productivity and economic growth, including the recent report by David Skilling *Frontier Firms: An international small advanced economy perspective* prepared for the New Zealand Productivity Commission. This report is attached as **Annex Two**.

49 To achieve a step change for our productivity performance we must focus our efforts on a small number of sectors or groupings of interconnected sectors where we have an existing competitive advantage, or have high potential to build one. It means investing at significant scale in order to shift, rather than incrementally change, the performance of these sectors. It means using our full suite of levers to enable this transformation, considering for example, infrastructure investment, innovation, skills, procurement and access to capital. This is not about picking winners, but about backing high potential industries and providing the enabling environment to lift productivity, scale up, and create good, high-value jobs.

50 These are the sectors where Industry Transformation Plans will be a key tool. The development of an ITP means investing the time and energy necessary to bring an industry together, and agree upon a shared vision that reflects both industry's and Government's ambitions for the sector. It means analysing and understanding at a deep level what are the systemic issues holding a sector back from achieving those ambitions, and substantial investment, both from Government and industry, to overcome those issues and make a step change. This is a multi-year process of close engagement, evolving policy responses and substantial investment.

51 In identifying sectors for focus in driving productivity, there are a number of factors that we should consider, including:

51.1 whether New Zealand has a demonstrated or strong potential for a comparative advantage in the sector;

51.2 how internationally oriented the sector is, including level of exports;

51.3 the sector's current significance or potential for future growth, in particular the sector's contribution to GDP or productivity performance;

51.4 the sector's contribution to employment, including regional distribution, participation of Māori and of Pacific peoples, and quality of employment;

51.5 readiness for a high-engagement process on the part of government and industry.

52 I propose four areas for immediate focus for this part of our Industry Strategy.: construction, advanced manufacturing, digital technologies, and a food and fibre group consisting of the primary sector, wood processing, food and beverage manufacturing, and agritech.

53 These are broadly defined industries and through active industry policy approach we will explore ways of enabling growth of the sector as a whole, while also identifying specific areas of comparative advantage within the sector where further support could be targeted. While my focus with these sectors will be on productivity, we will

also consider sustainability and inclusivity outcomes in these sectors and ensure that the transformations we drive also progress our goals in those areas. This may also mean consideration of transition issues where transformation is disruptive to jobs and skill requirements. Improving sustainability and inclusivity of sectors not only creates stronger outcomes for New Zealanders, but can also reinforce our competitive advantage globally.

54 The food and fibre industry grouping recognises the food and fibre sector as an area of strong existing comparative advantage. We are one of the best places in the world to grow and create food and fibre, and have developed tremendous institutional knowledge and expertise in this area. Food and fibre is also New Zealand's largest source of exports, and a significant contributor to GDP. Food and fibre is a major employer, both in regions and for Māori, and for Pacific peoples (for example, Māori in forestry and wood processing, and Pacific peoples in food and beverage manufacturing). There is a recognised potential to shift towards value-added products enabling increased productivity. Increasing the sustainability of the sector would be inherently beneficial, but would also allow us to build on New Zealand's clean and green image as an area of advantage for our food and fibre products.

55 This aligns with the Fit for a Better World Action Plan recently presented to this Committee by the Ministers of Agriculture, Forestry and Fisheries, and transformation of this group of industries will be progressed through this Action Plan. Nested within the Action Plan are ITPs for forestry and wood processing and food and beverage sectors. I suggest the agritech sector (while having its own ITP) is usefully included in this grouping given the potential to not only create value through exporting the knowledge we build, but in lifting productivity, creating value and improving sustainability throughout the rest of the food and fibre industries.

56 Digital technologies is an area where we are able to overcome the tyranny of distance through weightless digital exports. Start-ups are able to develop an idea here at the bottom of the world, take it global, and rapidly scale as a result. Our digital sector is strongly internationally oriented and is already providing strong productive growth, high-wage employment and the emergence of large firms. Though we have enjoyed success in this area, there are more opportunities to develop and scale up export focused businesses. Confidential advice to Government

57 Advanced manufacturing is a broad sector that contains many areas of high-value production and exports. It is vital for adding value to the products we produce and also creates demand for high-value services across the economy. Manufacturing is particularly internationally focused and often interlinked with international supply chains. New Zealand has expertise in a number of areas, but is particularly strong at addressing high-value niche areas within global supply chains, and at high-value short-run manufacturing, where manufacturers are able to rapidly adapt and provide relatively small, bespoke production runs.

58 My focus will be on assisting New Zealand manufacturers to adopt advanced manufacturing techniques and technologies that will improve productivity and ongoing international competitiveness. Manufacturing is a large employer, and improving technology adoption will enable the upskilling of workers, and better quality and better paid jobs. We must also identify and support high-value, niche areas of manufacturing where New Zealand firms can be successful. Though advanced manufacturing does not have an existing ITP or work programme, a willing and

representative industry partner exists and there is a strong opportunity to rapidly develop an ITP for the sector.

59 An initiative currently underway that an advanced manufacturing ITP will build on is the Industry 4.0 Demonstration Network, which is aimed at increasing the adoption of advanced manufacturing technology and techniques amongst New Zealand manufacturers. This initiative was funded in Budget 2019, but now requires a fiscally neutral swap from capital to operating funding of $600,000. This is due to a change in approach with a key asset for the initiative now to be purchased and owned by a third-party.

60 Developing highly productive and internationally competitive clusters of businesses for these three sectors - food and fibre, digital technologies and advanced manufacturing will be key priorities for me under the Economic Development portfolio. This includes delivering ITPs for digital technologies and advanced manufacturing, implementing the agritech ITP, and supporting the development of ITPs for forestry and wood processing and food and beverage manufacturing within the food and fibre grouping.

61 Though it does not have the same international focus as the other sectors in this area, the construction sector requires particular focus because it is such a large employer and has a critical role in infrastructure provision and housing supply, but has been plagued by entrenched low productivity. It will also be an important sector for driving recovery for the economy as a whole. The issues of the sector are being addressed through the Construction Sector Accord and substantial progress has been made through the last year.

62 Included within the driving productivity grouping are the five sectors for which ITPs are currently underway, including the digital technologies and construction sectors, and several parts of the food and fibre group. In continuing to work with these sectors, we acknowledge their ongoing importance to the future of our economy. We are cognisant of how impacts of COVID-19 have changed the context for these ITPs and as such, these plans and processes will pivot accordingly. Updates and next steps are provided in **Annex Four**.

63 Confidential advice to Government

64 Additionally, our work with social partners on developing an ITP Handbook is continuing. The handbook outlines the purpose and objectives of ITPs and industry planning more generally, and provides guidance on how they can be developed. The handbook is intended to help enable industries to coordinate and undertake their own long-term transformation planning.

Success across our Industry Strategy requires strong leadership and coordination

65 The transition or transformation of industries set out in this strategy requires bold action and strong partnerships in order to deliver stronger outcomes for New Zealanders. To accomplish this we need strong leadership and coordination across government.

66 There needs to be buy-in, support, and coordination from all parts of government to progress this work. While each focus industry has a lead Minister and agency, the development and delivery of initiatives for each sector cannot be achieved by any one portfolio or agency in isolation. Success requires coordinated effort across the system, including:

66.1 linking sectors into cross-cutting reforms and work programmes e.g. the Reform of Vocational Education, Workforce Development Councils, Three Waters Review, or active labour market policies;

66.2 informing and leveraging infrastructure development;

66.3 leveraging regional expertise or funding mechanisms e.g. Regional Skills Leadership Groups or the Provincial Growth Fund;

66.4 aligning with other work programmes focused on long-term shifts e.g. work on the transition to a low-emissions economy, future of work, and

66.5 drawing on policy levers that rest with other agencies or portfolios e.g. our Research, Science and Innovation system.

67 Strong leadership and coordination can be achieved through a combination of a set of principles that guide our approach to our work with sectors, and a governance structure that supports coordination across sectors and workstreams, enabling us to identify gaps and complementarities and overcome issues.

A common set of principles should guide our approach

68 We previously agreed [DEV-19-MIN-0337] that the ITPs would be shaped by the following guiding principles:

68.1 taking a partnership-led approach, developing solutions with stakeholders;

68.2 building and using a strong evidence base to guide our focus and interventions, including robust evaluation and monitoring;

68.3 using specific sector strategies;

68.4 leveraging international connections, and being consistent with our international obligations and trade policy settings;

68.5 providing clear and consistent signals from the Government on a proposed course of action; and

68.6 ensuring our activity is supporting better jobs, involving decent and sustainable work, and good wages and conditions.

69 In my view these principles remain core to this Industry Strategy and should be applied in our work with all of our sectors of focus, be they ITPs or other approaches.

70 The partnership principle is particularly important and successful partnership goes beyond consultation. It requires early and sustained efforts to involve a range of stakeholders in the development and decision making process. It will require clear and open communication between partners to understand where priorities are aligned, and where there are differences that will need to be worked through. A

strong, dedicated partnership will help ensure the goals and ambitions of our partners are being met while the sector is contributing more to our productive, sustainable and inclusive Economic Vision.

71 To reflect our new context and broadened strategy, I propose adding the following three principles to guide our approach:

71.1 upholding the government's obligations under Te Tiriti by working in partnerships with Māori.

71.2 ensuring that short-term actions are consistent with our long-term vision for the sector and the economy.

71.3 ensuring our activity is contributing positively to our sustainability goals and environmental resilience.

72 I also propose modifying two of the original principles to emphasise the importance of a tripartite approach to our industry partnerships:

72.1 taking a partnership-led approach, developing **collaborative** solutions with **business, workers and other** stakeholders.

72.2 providing clear and consistent signals from **both** Government **and industry** on a proposed course of action.

Governance arrangements will build on those agreed for ITPs and will include social partners and Māori

73 In December 2019, Cabinet agreed to a governance model for the implementation of ITPs [DEV-19-MIN-0337 refers]. An adapted form of this provides an appropriate governance structure for the Industry Strategy, as shown in **Annex Five**.

74 The Economic Development Ministers Group will have high level oversight of the Industry Strategy. It will be responsible for driving its contribution towards the vision of a productive, sustainable and inclusive economy; coordinating across portfolios and ensuring cross-cutting issues and opportunities are being picked up; and ensuring the approach being taken across sector work programmes is consistent with the principles of the strategy. The Economic Development Ministers Group supersedes the Future of Work Ministers Group that previously played this role in governance of the Industry Strategy.

75 Portfolio Ministers will maintain full responsibility and leadership for their sector work programmes and will have the opportunity to raise issues for discussion to the Economic Development Ministers Group.

76 In keeping with our partnership approach, I recommend that the governance structure also include a Tripartite Oversight Group, consisting of members from the New Zealand Council of Trade Unions, Business New Zealand and senior officials. This group will ensure that the views of social partners are feeding into oversight of the Strategy. Issues identified in this group can be raised with the Future of Work Tripartite Forum Governance Group (which overlaps with the Economic Development Ministers Group through the membership of the Ministers of Finance and Economic Development). The Industry Strategy may also be discussed as appropriate with the full Future of Work Tripartite Forum.

77 I seek Cabinet's agreement that Māori will be included in this governance framework, and that the Minister for Māori Crown Relations: Te Arawhiti, the Minister for Māori Development and I will agree on the final structure that includes Māori participation based on further work by officials.

78 Māori participation within the governance of the Industry Strategy, and agency engagement with Māori on a sector-by-sector basis, is essential to enable a step-change for the Māori economy through the Industry Strategy.

79 My officials at MBIE will continue to work with Te Puni Kōkiri and Te Arawhiti to develop advice on the best way to ensure Māori participation in this governance structure. Further work is required to land this advice, including agreeing the relevant people or groups to include in the governance structure, and engaging with relevant Māori groups on their appetite for involvement in the governance of the Strategy.

80 I note that the composition of the Oversight Group in the governance model may be amended based on the outcomes of decisions about how Māori are best included in the governance structure.

Financial Implications

81 As noted earlier, active industry policy is a high-engagement, resource-intensive process, and achieving meaningful transformation will require substantial investment for each focus sector. Significant funding will be required to achieve meaningful transformation of these sectors and to drive us towards the productive, sustainable, and inclusive vision of the Economic Plan.

82 MBIE has received funding through the CRRF for initiatives for three focus sectors: agritech, construction, and digital technologies, as well as for engagement for the next sectors being led from my portfolio. With the transfer of leadership of the Food and Beverage and Forestry and Wood Processing focus sectors, some of the engagement funding received by MBIE will also support initial engagement work for these sectors.

83 I intend to seek further funding for those additional sectors being led from my portfolio, as well as for additional initiatives that are beyond the scope of current funding.

84 Funding has also been secured for work programmes for other focus sectors, including tourism and aviation. For other focus sectors under the refreshed Industry Strategy, lead agencies are best placed to seek funding directly from the CRRF and in future Budgets for engagement and for the development and implementation of sector plans and initiatives that align with this Strategy.

85 MBIE has also received funding to support initiatives that enable Māori to leverage opportunities presented by work with the focus sectors under this Industry Strategy. MBIE will administer this fund.

86 The Industry 4.0 Demonstration Network initiative aimed at increasing understanding and uptake of advanced manufacturing technology and techniques amongst New Zealand manufacturers requires a fiscally neutral capital to operating swap of $600,000 in funding approved in Budget 2019.

Population Implications

87 On the whole, the focus sectors selected are weighted towards more male-dominated sectors with women being overrepresented in the education sector (70 per cent), but highly underrepresented in the forestry and mining, construction, and manufacturing sectors (19 per cent, 19 per cent and 27 per cent respectively), as well as the electricity, gas and waste water services (28 per cent) and transport, postal and warehousing (29 per cent).

88 It is possible that providing tailored support for focus sectors where women are overall underrepresented could exacerbate inequality between genders, however our Industry Strategy also represents an opportunity to work with stakeholders to push for more inclusivity in our focus sectors.

Human Rights

89 There are no human rights implications arising from this paper.

Consultation

90 The following agencies were consulted on this paper: the Ministry of Social Development, The Treasury, the Ministry for Primary Industries, Te Uru Rākau, the Ministry of Foreign Affairs and Trade, New Zealand Trade and Enterprise, Te Puni Kōkiri, Callaghan Innovation, the Ministry for Culture and Heritage, the Ministry of Education, Inland Revenue, Education New Zealand, the Tertiary Education Commission, the Ministry of Transport, the Department for Prime Minister and Cabinet, Ministry for the Environment, the Ministry for Pacific Peoples.

Communications

91 Where sector plans are developed, be they recovery, transformation or transition plans, these will be delivered and launched. This includes ITPs for the sectors for which these are underway.

Proactive Release

92 I intend to proactively release this Cabinet paper in July 2020.

Recommendations

The Minister for Economic Development recommends that the Committee:

1 **Note** the ongoing importance of Industry Strategy to a post-COVID-19 recovery plan and for achieving the vision of our Economic Plan to transition the economy to be more productive, sustainable and inclusive.

2 **Agree** that the scope of Industry Strategy must be broadened due to the impact of COVID-19 to **address** industries that are facing massive disruption and need support to reset and transition, or may not be areas of strong growth potential, but need to strengthen resilience in order to best contribute to our vision of a productive, sustainable and inclusive economy.

3 **Agree** to the **following** selection and categorisation of focus sectors under Industry Strategy:

a. International Education – Resetting

b. Tourism – Resetting

c. Energy and resources – Strengthening resilience

d. Transport and logistics – Strengthening resilience

e. Construction – Moving from Volume to Value

f. Advanced manufacturing – Moving from Volume to Value

g. Food and fibre grouping

    i. Primary – Moving from Volume to Value

    ii. Food and beverage manufacturing – Moving from Volume to Value

    iii. Forestry and wood processing – Moving from Volume to Value

    iv. Agritech – Scaling up Value

h. Digital technologies – Scaling up Value.

4 Confidential advice to Government

5 Confidential advice to Government

6 **Note** that Ministers may continue to work to support and develop those sectors not being progressed as Industry Transformation Plans.

7 **Note** the importance of ensuring coordination and alignment between Industry Strategy and other government programmes.

8 **Note** that the following guiding principles previously agreed by Cabinet [DEV-19-MIN-0337] remain core to an active industry policy approach:

a. taking a partnership-led approach, developing solutions with stakeholders;

b. building and using a strong evidence base to guide our focus and interventions, including robust evaluation and monitoring;

c. using specific sector strategies;

d. leveraging international connections, and being consistent with our international obligations and trade policy settings;

e. providing clear and consistent signals from the Government on a proposed course of action; and

f. ensuring our activity is supporting better jobs, involving decent and sustainable work, and good wages and conditions.

9 **Agree** to the following additions to the guiding principles:

a. upholding the government's obligations under Te Tiriti by working in partnerships with Māori;

b. ensuring that short-term actions are consistent with our long-term vision for the sector and the economy; and

c. ensuring our activity is contributing positively to our sustainability goals and environmental resilience.

and modifications to two of the previously agreed guiding principles:

d. taking a partnership-led approach, developing collaborative solutions with business, workers and other stakeholders; and

e. providing clear and consistent signals from both Government and industry on a proposed course of action.

10 **Agree** that those broadened principles will guide our work with focus sectors in this Industry Strategy.

11 **Agree** to the proposed governance structure for the Industry Strategy, with the Economic Development Ministers Group maintaining high-level oversight of the Industry Strategy.

12 **Agree** that portfolio Ministers will maintain full responsibility and leadership for their sector work programmes.

13 **Agree** to the establishment of a Tripartite Oversight Group to ensure the views of social partners are considered.

14 **Agree** that Māori will be included in the Industry Strategy governance structure.

15 **Agree** that officials undertake further work to consider how Māori are best included in the Industry Strategy governance structure, and that the Minister for Economic Development, Minister for Māori Crown Relations: Te Arawhiti and Minister for Māori Development will make final decisions about how Māori can best be included.

16 **Note** that the membership and function of the Tripartite Oversight Group in the governance structure may change, depending on the outcome of decisions on how to incorporate Māori representation into the governance structure.

17 **Note** funding for some sector work programmes has been received through the CRRF to date, but that further funding will be needed to progress work programmes and to fund engagement and initiatives associated with the Industry Strategy.

18 **Agree** that lead agencies will seek funding through the CRRF and future Budgets for those focus sectors for which they are responsible.

19 **Note** that the agritech ITP will shortly be finalised and launched.

20 **Authorise** the Minister of Finance and the Minister for Economic Development, in regard to the capital funding approved in Budget 2019 for Industry 4.0 [CAB-19-MIN-0174.05 refers], to approve jointly at the next October Baseline Update (OBU) a fiscally neutral capital to operating swap of up to $0.600m from the Ministry of Business, Innovation and Employment - Capital Injection into the Economic Development: Future-proofing New Zealand's Manufacturing Sector by Driving Industry 4.0 Uptake and Skills Development appropriation.

21 **Authorise** the Minister of Finance and Minister for Economic Development to rephase the swapped operating funding in recommendation 20 above from 2020/21 and into outyears if required as the asset will now be purchased by a third party.

Authorised for lodgement

Hon Phil Twyford

Minister for Economic Development

Annex One: Industry Strategy Framework

Category (Objective)	**Driving Productivity**		**Managing Transitions**	
	Scaling up Value	**Moving from Volume to Value**	**Strengthening Resilience**	**Resetting**
Description	**Drivers of future productive growth** – These are high value sectors that will support a more productive, sustainable, inclusive and resilient economy long term. Many of these sectors are not of sufficient scale currently to pull us out of this crisis, but are necessary investments in a future differentiated, resilient, knowledge intensive, high-value economy. For example, the agritech sector.	**Drivers of future productive growth** – These are sectors that are significant employers and exporters, with opportunities to become more productive and move up the value chain, as well as make improvements in inclusivity and sustainability outcomes. These sectors will drive economic recovery and can be supported in the long term to realise these opportunities. For example, the primary and advanced manufacturing sectors.	**Critical enablers** – These are strategically important sectors that are not significant drivers of growth, but which play a critical role in the functioning and resilience of the economy or towards other government goals (e.g. emissions reduction), and need to be maintained, strengthened and, in some cases transformed, in order to contribute to a more productive, sustainable and inclusive economy. Significant transformation may be needed, particularly where there are long-term environmental sustainability issues such as high emissions. For example, the transport and logistics or energy and resources sectors.	**Significantly disrupted** – These are sectors that are likely not viable in their current form in a post-COVID environment, and are facing a decline, or need significant re-shaping. For example, the tourism and international education sectors.
Criteria for categorisation	a) Opportunities for higher value jobs for New Zealanders; and b) Existing or emerging strengths/ comparative advantage; and c) Future growth opportunities in NZ and overseas markets; and d) Potential to support sustainability goals (e.g. low emissions, climate resilient, low waste); and e) Potential to support inclusiveness goals (e.g. regional employment, high paying jobs).	a) Existing significant contributor to economy and continued potential growth opportunities; and b) Scope for adding value/productivity gains; and c) Potential to support sustainability goals (e.g. low emissions, climate resilient, low waste); and d) Potential to support inclusiveness goals (e.g. regional employment, high paying jobs).	a) 'Strategically important' either because: i. Essential infrastructure/service. ii. Critical enabler for other key sectors. iii. Critical for achieving long-term commitments. iv. Critical for resilience including differentiating the economy, or self-sufficiency in key goods or services. v. Critical community contribution.	a) Not viable in their current form in the short run (constrained by border restrictions or other COVID-19 impacts); or b) Facing decline in the medium- to long-term due to structural change; or c) Significant sustainability challenges (emissions intensive); or d) On average low value, low wage industries; and e) Not a critical enabler in the economy.
Considerations for the appropriate level of government intervention (e.g. active role vs. light touch support)	**Counterfactual:** Likelihood of sector to recover/grow without support (including exposure of sector to international change). **Size of opportunity** (with support) for: i. Further growth ii. Supporting environmental and inclusivity goals. Existing private sector investment **Positive spill-over impacts,** including for example further enhancing New Zealand's reputation (soft power) that will benefit international trade in a broad range of areas in the long run.	**Counterfactual:** Likelihood of sector to recover without support (including consideration of cyclicality and exposure of sector to international change). **Size of opportunity** (with support) for: i. Productivity improvements and adding further value ii. Supporting environmental and inclusivity goals. **Positive spill-over impacts**	**Counterfactual:** Likelihood of sector to recover and make necessary transitions (e.g. emissions reductions) without support (including exposure of the sector to international change). **Flow-on risk:** Level of connectedness with other parts of the economy and level of reliance other parts of the economy have on the sector. **Limitations on growth potential** **Size and regional significance** of sector: i. share of employment and GDP ii. share of regional employment, regional GDP. **Size of opportunity** (with support) to support environmental and inclusivity goals.	**Counterfactual:** Ability to manage decline without intervention (e.g. transferability of jobs). **Flow-on risk:** Level of connectedness with other parts of the economy (risk that decline will have flow on effects). **Size and regional significance** of sector: i. share of employment and GDP ii. share of regional employment, regional GDP. **Opportunity** to redeploy resources to growing sectors that support environmental, productivity, and inclusivity goals.
Broad focus of intervention *Note: The approach to intervention will depend for example on the level of industry coordination and regional concentration, as well as regional priorities and needs.*	In the near-term (wave 2), the focus should be mitigating the impacts of the COVID-19 crisis to ensure these sectors will be in a position to recover heading into post-recovery/wave 3. For example, supporting vulnerable start-ups that will be essential for the future development of these sectors. Post-recovery (wave 3) the focus should be on enabling further growth alongside sustainability and inclusiveness gains. Examples of interventions include: • Removing barriers, including through enabling regulatory measures and combining specialised skills development with judicious use of the immigration system to address skills shortages. • Trade policy to support diversification and protect offshore market access (e.g. concluding FTAs and upgrading existing ones). • Co-investment/investment attraction. • Start-up support, including in R&D infrastructure. • Company capability building.	In the near term (wave 2), the focus should be on driving economic recovery through enabling growth and filling labour shortages (to support re-employment of displaced workers). In the longer-term (wave 3), the focus should be on transitioning these sectors to improve their productivity, sustainability and inclusivity (including improving the quality of growth and jobs). Examples of interventions include: • Encouraging investment in productive technology, skills and innovation/R&D (e.g. co-investment, accelerated depreciation). • Active labour market assistance, such as job matching, mobility assistance, retraining/upskilling of workers, industry relevant training for youth. • Capability building and support with market insights into value-add opportunities. • Judicious use of the immigration system to source skills not available in New Zealand.	In the near-term (wave 2), the focus should be ensuring they are functioning. In the longer-term (wave 3), the focus should be on building in further resilience where necessary as well as supporting improvements in productivity, sustainability and inclusiveness where possible. Examples of interventions include: • Co-investment and government procurement (e.g. infrastructure investment). • Active labour market programmes, including retraining. • Removing barriers including trade and export policy measures (e.g. focus on reducing offshore Non-Tariff Barriers). • Company capability building. • Development of emissions reduction pathways.	In the near-term (wave 2), the focus should be supporting the people in these sectors through income support, redeployment and other active labour market programmes. In the longer-term (wave 3), the focus should be on transition planning support, working together with the sectors to identify viable long-term visions, including consideration of regional impacts. This might include support for re-shaping sectors towards lower volume, higher value outcomes (e.g. higher value tourism) – including support for change in business direction or target market.

Annex Two: *Frontier Firms: An international small advanced economy perspective* by David Skilling

Annex Three: Evidence Base

Annex Four: Update on ITPs for the Construction; Agritech; Digital Technologies; Food and Beverage; and Forestry and Wood Processing sectors

Construction

The Construction Sector Accord was launched by the Prime Minister in 2019. It acts as a platform for construction industry leaders and government to work together following a shared set of goals and principles for the benefit of the sector and New Zealand more broadly. A Transformation Plan to address shared goals – increasing productivity, raising capability, improving resilience and restoring the sector's confidence, pride and reputation, was launched in January 2020 prior to the impacts of COVID-19. The Construction Sector Accord Steering Group have continued to deliver against the Transformation Plan, and are adding new and emerging opportunities, e.g. a stronger focus on the environment, and industry stimulus.

Because it was in place prior to COVID-19 lockdown, the Construction Sector Accord have acted and are acting as an invaluable forum to support construction sector recovery. In April 2020, the Construction Accord COVID-19 Response Forum was convened to address the impacts of COVID-19 in the construction sector and support a focus on industry resilience and recovery, and enabled the industry to provide collaboratively-developed advice and support to government.

Agritech

The overall objectives of the agritech ITP are to develop the agritech sector as a high-value sector with significant export potential, as well as to drive productivity and sustainability improvements in our primary sector. Six workstreams were developed, focussed on areas such as strengthening global links, improving commercialisation flow and developing skills of the agritech and primary workforce. Three high-impact projects were also developed. The ITP has been publically consulted (as approved by Cabinet [DEV-19-MIN-0337]) and was finalised immediately prior to the level 4 lockdown. Due to the lockdown its planned launch on April 7th was postponed.

The direction and key workstreams of the agritech ITP remain relevant, but the implementation of initiatives will shift somewhat in focus and timing due to the impacts of COVID-19, with more of a focus on initiatives that can be progressed domestically under a travel-restricted environment. The launch of the agritech ITP will proceed following modifications to reflect the new context.

Digital Technologies

The overall objective of the digital technologies ITP is to grow the digital technologies sector as a high-value, highly-skilled sector with spillovers to the rest of the economy. Key workstreams were identified based on engagement with the sector in late 2019, including qualifications and education, developing New Zealand's tech brand, enabling Māori success, developing an AI strategy and others. Prior to moving into Alert Level 4, work was underway to develop initiatives within these workstreams.

The workstreams identified will remain relevant to the direction of the ITP, but given the significant challenges and opportunities presented by the impacts of COVID-19, we are now considering broadening the focus of the ITP to include aligning with work in the Small Business portfolio to increase the uptake of digital technologies across the economy, and aligning with DIA efforts to improve digital inclusion and equity.

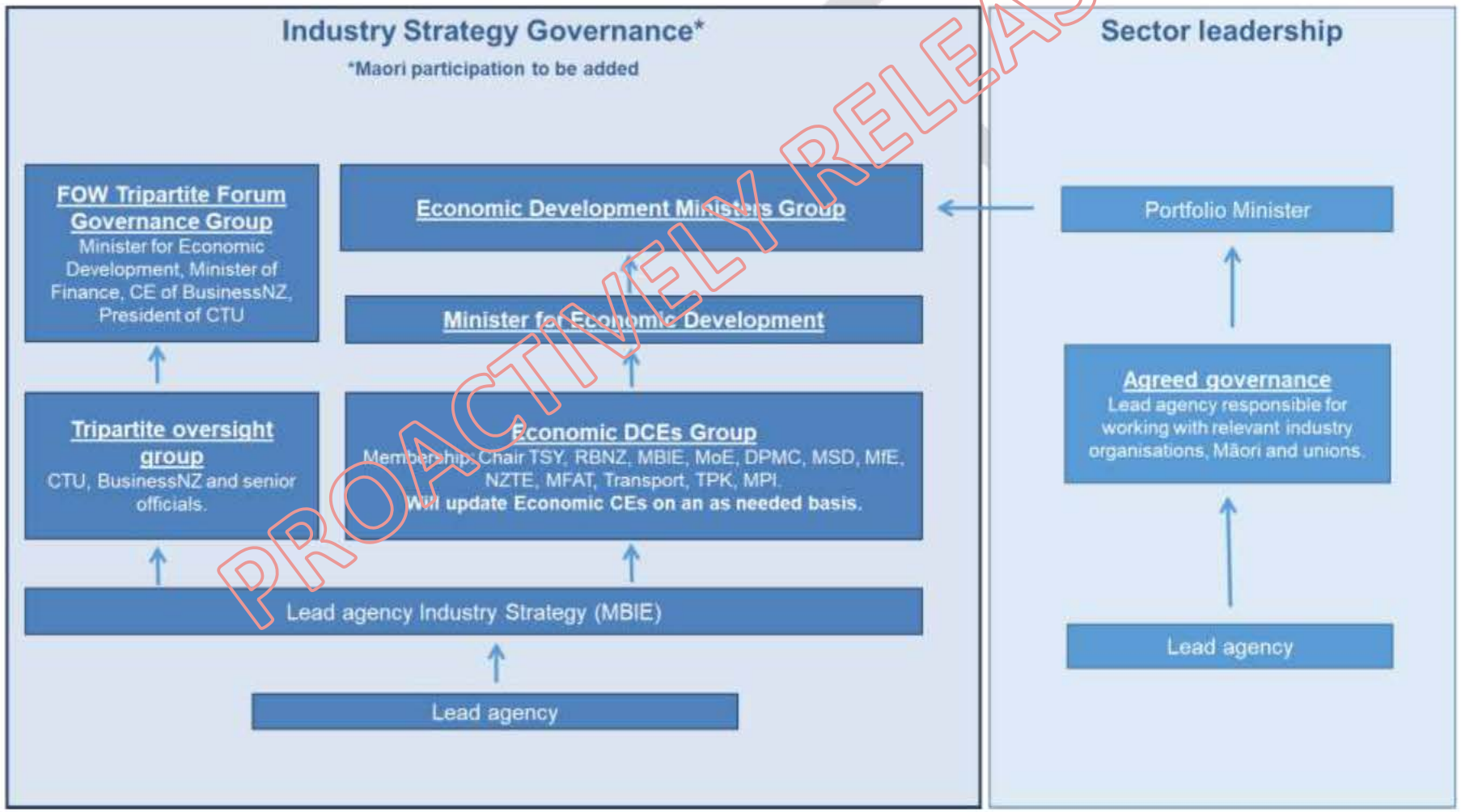
Food and Beverage, and Forestry and Wood Processing

The Primary Sector Council (PSC) released its "Fit for a Better World" vision in December 2019. A pan-Sector Strategic Coordination Group has been convened to co-ordinate engagement through sector based work groups from across industry to quickly make progress or resolve issues. The PSC vision is the result of consultation with many sector participants over two years.

In response to the COVID-19 crisis, the Ministers of Agriculture, Forestry and Fisheries have developed an Action Plan – "Fit for a Better World: Accelerating our Economic Potential", which incorporates a range of initiatives and actions to give effect to the Primary Sector Council's vision. This action plan will form the framework from which both the forestry and wood processing and food and beverage ITPs will be progressed. While these two ITPs are still taking shape, a broad purpose of the ITPs is to unlock opportunities for sustainable and inclusive growth, and in parallel, support generating greater returns along the value chain, particularly by driving innovation.

These aims are consistent with the activities in the Action Plan that target the significant economic and environmental opportunities in the agriculture, forestry, horticulture, aquaculture, and Māori agribusiness sectors, and in the areas of new product development, and research, science and innovation. MPI and Te Uru Rākau will continue to work with MBIE on shaping the ITPs to deliver on the initiatives outlined in the Action Plan in a way that is consistent with the intent of the Industry Strategy.

Annex Five: Industry Strategy Governance Model



Frontier firms: An international small advanced economy perspective

David Skilling

Prepared for the New Zealand Productivity Commission

May 2020

LANDFALL STRATEGY GROUP

LANDFALL
STRATEGY GROUP

Executive Summary

New Zealand has weak aggregate productivity performance, relying on growth in the labour input to drive headline GDP growth. And there has been little sign of convergence towards the global productivity frontier, despite high quality policy foundations. This is reflected in the performance of New Zealand firms: few New Zealand firms are at the global productivity frontier. Strengthening New Zealand's productivity performance in a material way rests on developing more frontier firms at scale.

To provide insight into these issues, this paper draws on the international small advanced economy experience. Small advanced economies are not just scaled-down versions of large economies, but have distinctive characteristics in their economic behaviour and performance. Understanding the productivity dynamics of these small economies can provide specific guidance for New Zealand in developing productivity policy. Looking across the small advanced economy group, there are several clear insights.

First, the performance of internationally oriented sectors is central to the performance of small advanced economies. Productivity performance in the domestic economy is constrained in small advanced economies, because the small size of the market limits competitive intensity as well as opportunities for scale and specialisation. However, firms in internationally oriented sectors that scale into international markets are much more likely to be close to the productivity frontier.

Second, large firms play a particularly important role in the productivity performance of small advanced economies. Larger firms have higher levels of productivity, are more likely to export, to innovate, and to pay higher wages. On several measures, small advanced economies have a high number of large, internationally engaged firms that have played a significant role in driving global engagement and productivity growth. An SME-based approach is likely to be under-powered.

Third, small economy firms at the productivity frontier tend to operate in deep clusters, in which they can benefit from external scale economies: flows of knowledge, access to highly-skilled labour, dense backward and forward linkages, specialist advisory services, and so on. This context makes it more likely that firms will be able to develop positions of sustainable competitive advantage based on knowledge and innovation, and move towards the productivity frontier. In small advanced economies, there will only be a handful of internationally oriented clusters with the necessary critical mass for success.

Implications for New Zealand

There are several distinctive features of New Zealand's economic structure and dynamics that provide insight into the relative absence of frontier firms. Relative to other small advanced economies, New Zealand has low levels of international economic engagement; has few firms exporting or investing offshore at scale; and does not have dense, innovative, high-growth clusters of scale around its major areas of competitive advantage in the primary sector and the weightless economy.

Large parts of New Zealand's international sectors are in ownership structures that constrain growth in the cluster. The co-operative structure and regulatory context constrain risky investments, and make it more likely that the product mix is commodity-based. This has improved over time, but New Zealand has not produced competitive, high growth multinational companies (MNCs) around the primary sector.

There has been less of a shift into knowledge-intensive activities than seen in many other small advanced economies. Directly knowledge or technology-intensive exports remain a relatively small part

of New Zealand's export structure despite recent growth. This is largely due to policy choices: New Zealand has not invested in skills and innovation to nearly the same extent as high performing small advanced economies; and has not focused on developing knowledge intensive competitive advantage.

An agenda for action

Policy choices need to connect to these drivers of growth in order to have a material impact on New Zealand's productivity performance. An agenda for action is proposed, organised around four themes.

International focus: Policy to strengthen frontier firms, and to boost productivity performance, should be focused on internationally oriented clusters: the productivity growth engines of small advanced economies. Productivity improvements can also be made in domestic sectors, but the constraints in these sectors will limit the productivity upside. The current agnostic policy approach that treats international and domestic activities neutrally is not appropriate in a small advanced economy context.

Strategic clusters: Policy should aim to build critical mass in a limited number of internationally oriented clusters that can make a material contribution. There are two broad clusters of activity where New Zealand firms have some competitive advantage in global markets. The first is the primary sector. Unleashing the performance of this sector is critical, given the scale of these activities. There have been some success stories, but much more is needed. And support is needed to transition these sectors to respond to competitive dynamics as consumer preferences shift in red meat, dairy, and so on. Second, weightless sectors such as digital, creative, and other knowledge-based services, where distance from market is much less of a barrier, and where there is some evidence of global competitive strength.

Policy instruments: Policy should be focused on the binding constraints on growth in key firms and clusters in order to create a platform for productivity growth. It is difficult to make progress on overall productivity performance if productivity and growth in large exporting firms is constrained. Policy should address growth constraints in the primary sector due to ownership, governance, and capital market issues, and the development of the broader cluster beyond the dominant firms.

There is also a need for a substantially increased investment in skills and innovation, with a particularly focus on these growth sectors, to support the transformation of New Zealand's international economic engagement by firms that are moving to the productivity frontier. New Zealand's R&D investment needs to be increased to the levels seen in other high-performing small advanced economies (~3% of GDP v New Zealand's 1.4%). Similarly, focused investments in research institutions and universities are required to support sustained growth in frontier firms.

Firm capability & incentives: Private sector behaviours are an important reason for the absence of frontier firms. Management capability and aspiration remain constrained despite some progress. And there are weak incentives to expand: many firms and capital markets see higher returns in the domestic market than offshore, and there is a lack of competitive pressure to expand and invest. Addressing capability and incentive issues should be a priority for action. This can only be shaped indirectly by policy; changed private sector behaviours and attitudes are also needed to strengthen productivity.

New Zealand has debated economic transformation for decades, but has not made much progress. A more granular, bottom-up policy approach focused on unleashing growth in international clusters has more potential in developing frontier firms and raising productivity performance. The small economy experience provides a measure of confidence that this can be done even in a challenging global context.

Introduction

This paper uses the international small advanced economy experience to provide perspectives on the relatively low number of frontier firms in New Zealand, as well as to identify classes of policy action that could lead to improved performance. This productivity challenge is even more acute in the wake of the economic shock caused by Covid-19, which will require New Zealand to develop more distinctive competitive advantage to compete in a low global growth environment.

This international small economy perspective is useful for New Zealand, as it highlights a series of properties that matter disproportionately for the growth process in small advanced economies. Different factors matter for productivity growth in small advanced economies than in larger economies: small economies are not scaled-down versions of large economies, and policy needs to be set accordingly.

This bottom-up, firm-based approach to New Zealand productivity offers new insights into policy actions that can lift New Zealand's productivity performance. There has been a couple of decades worth of analysis describing New Zealand's weak productivity performance, identifying contributing factors such as weak business investment, low R&D spending, and low levels of exporting.[1] And efforts have been made by various governments over this period in response, from tax reform to enterprise policy. But New Zealand's productivity dynamics have not strengthened meaningfully.

The aim of this paper is to offer some perspectives on the type of policy interventions that will lead to material improvement in New Zealand's productivity. New Zealand's small size – and small number of large or high growth firms – makes it feasible to use this firm-focused perspective to generate specific insights on how to raise aggregate productivity. This paper draws on my proprietary research and advisory work with small advanced economy governments over the past decade, and my past 20 years of engagement in the New Zealand economic policy debate.

This paper is structured as follows. Section 1 provides brief background context in terms of New Zealand's aggregate and firm-level productivity performance. Section 2 presents the international small advanced economy experience on the characteristics of high productivity firms. Section 3 considers the New Zealand context relative to this international experience and identifies several reasons for the relative absence of frontier firms.[2] Section 4 discusses policy responses that will support the development and growth of frontier firms in New Zealand. Section 5 concludes.

1. Background

The background and motivation to this study on frontier firms – New Zealand's persistently weak productivity performance – is well-understood and documented by the Productivity Commission and

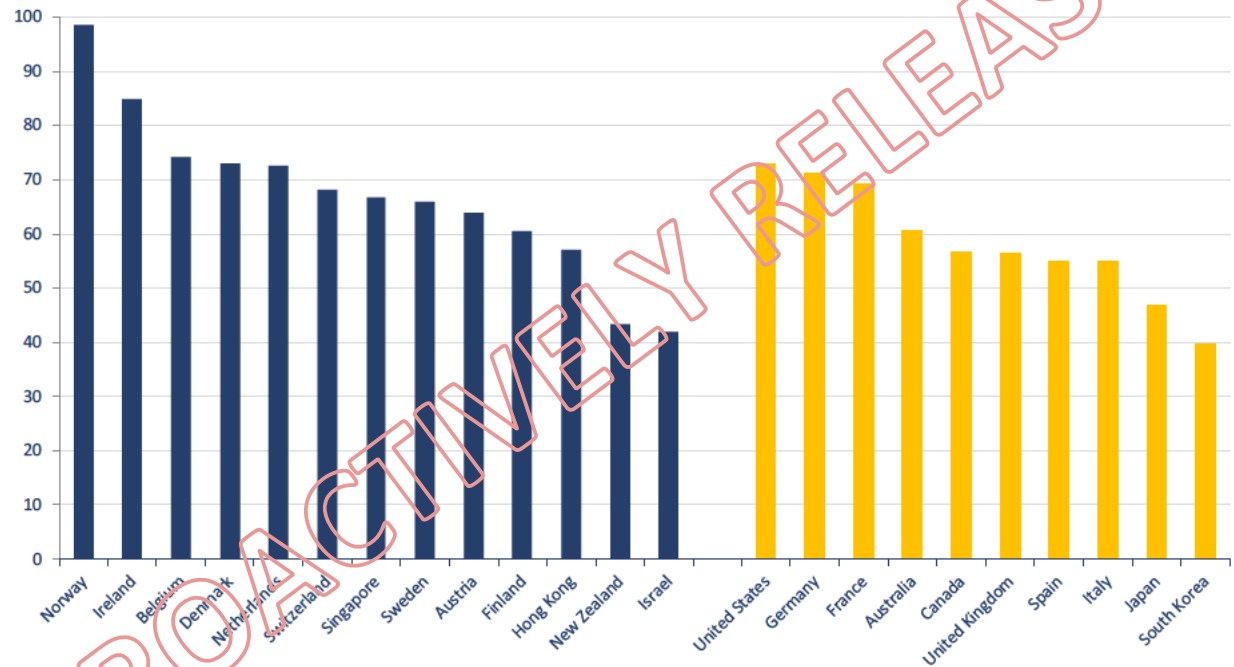
[1] For example, refer to the Treasury's 'Economic Transformation' work from 2001.

[2] For the purposes of this paper, I define frontier firms as those operating at the global productivity frontier (a more demanding definition than firms operating at the domestic New Zealand productivity frontier).

others.[3] New Zealand's per capita income is relatively low, but would be lower again were it not for strong performance in hours worked per capita. Relative to Australia, New Zealand's level of labour productivity is about one third lower. And relative to small advanced economies, there is a larger productivity gap again (Exhibit 1).

Exhibit 1: New Zealand's labour productivity level is near the bottom of the small advanced economy group

Labour productivity (GDP per hour worked), 2016 PPP dollars, 2018



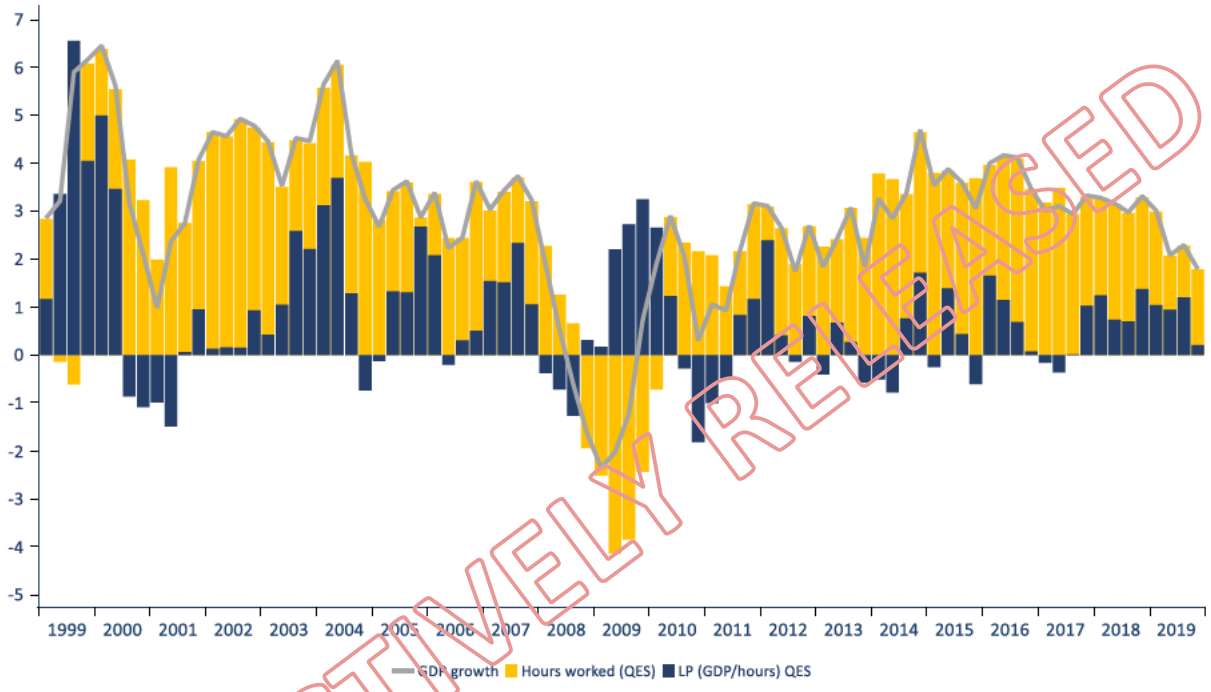
Source: Macrobond, The Conference Board Total Economy Database

Much of New Zealand's GDP growth over the past 30 years has come from growth in hours worked, with low labour productivity growth rates (Exhibit 2).

[3] *For example: Paul Conway, 'Can the kiwi fly? Achieving productivity lift off in New Zealand', New Zealand Productivity Commission, June 2018 (https://www.productivity.govt.nz/research/nz-productivity/)*

Exhibit 2: GDP growth has been largely due to growth in hours worked

Real GDP growth (sa), %, compared to quarter of previous year, Q1 1999 – Q4 2019



Source: Macrobond, Statistics NZ, Landfall Strategy Group calculations

There has been no meaningful improvement in New Zealand's relative productivity performance over the past few decades. This is partly because the incentives to act to lift labour productivity have been relatively weak, including a relatively high cost of capital and an abundant supply of labour (high participation rates, good demographics, strong net migration inflows) as well as the small domestic market. New Zealand firms have expanded through labour rather than through capital and technology; New Zealand's business investment rates remain relatively low. There has been no meaningful convergence towards the global productivity frontier over the past decades.

As noted in the Issues Paper released by the Productivity Commission, this weak overall productivity performance is consistent with the relatively weak performance of frontier firms in New Zealand. The Terms of Reference to this Inquiry notes that 'While New Zealand has some world-leading firms, on average our frontier firms are not performing as well as their international peers'.[4]

[4] *New Zealand Productivity Commission, 'New Zealand firms: reaching for the frontier', Issues Paper, April 2020 (https://www.productivity.govt.nz/inquiries/frontier-firms/issues-paper/)*

Small advanced economies are a very useful comparator group for New Zealand in understanding the priorities for action in strengthening productivity performance.[5] For one thing, small advanced economies are high-performing economies, generating strong economic and social outcomes. But they also face the constraints of a small domestic market as New Zealand does. Although every small economy has distinctive features – Singapore and Ireland are different than Denmark and New Zealand – by looking across the group of small advanced economies, some common themes associated with small advanced economy performance can be identified.

Exhibit 3: Listing of small and large advanced economies

Small advanced economies

Country	Population	GDP/cap (USD)
Ireland	4,950,000	77,771
New Zealand	5,037,000	40,634
Norway	5,356,000	77,975
Finland	5,518,000	48,869
Singapore	5,670,000	63,897
Denmark	5,806,000	59,795
Hong Kong	7,560,000	49,334
Switzerland	8,545,000	83,717
Austria	8,950,000	50,023
Israel	9,054,000	42,823
Sweden	10,322,000	51,242
Belgium	11,458,000	45,176
Netherlands	17,231,000	52,368

Large advanced economies

Country	Population	GDP/cap (USD)
Australia	25,569,000	53,825
Canada	37,445,000	46,213
Spain	46,656,000	29,961
South Korea	51,845,000	31,431
Italy	60,360,000	32,947
France	64,725,000	41,761
United Kingdom	66,867,000	41,030
Germany	82,969,000	46,564
Japan	126,190,000	40,847
United States	329,272,000	65,112

Source: IMF World Economic Outlook, April 2020 (data for 2019)

The small advanced economy experience offers more practical insight for New Zealand than from larger economies that have a different set of economic dynamics. Small advanced economies are not simply scaled-down versions of larger economies, but have a range of specific characteristics that shape their growth process. This small economy experience, rather than benchmarking against larger economies in the OECD or even Australia (that has a GDP 7 times that of New Zealand), should inform New Zealand economic policy making.

[5] *I define small advanced economies as IMF advanced economies, with populations above 1 million and below 20 million people; and with a per capita income above USD30,000. This gives a core group of 13 small advanced economies that I use for analytical purposes.*

2. Characteristics of high productivity firms

This discussion considers the elements of high productivity performance in small advanced economies, and connects this to the existence of frontier firms in these economies. In aggregate, small economy labour productivity is higher than across large economies by around 10%; and there are not substantial differences in labour productivity growth rates between small and large advanced economies. The stronger small advanced economy GDP growth performance over the past few decades comes from superior small economy labour market performance (high participation rates, low unemployment rates). However, there is meaningful variation within and across small advanced economies in terms of productivity levels and growth rates. Understanding the sources of this variation in small advanced economy productivity performance can provide insight into the drivers of the New Zealand productivity experience and the priorities for action.

Three key characteristics can be identified from the small economy experience: the importance of internationally oriented sectors in providing the growth opportunities to support sustained firm-level productivity performance; the importance of large firms in driving material improvements in international engagement and productivity growth; and the central role of a limited number of world-class clusters in internationally oriented that have the critical mass to provide the external scale economies required to develop frontier firms.

International orientation

In small advanced economies, it is internationally facing sectors (activities with high shares of exports and outward direct investment) that are the engines of productivity growth. The domestically facing sectors are too small to allow for firms to grow to the productivity frontier. And there is significantly less incentive to invest in capital or innovation in these domestic sectors because of the small scale of the domestic market, the absence of external scale economies, and the relative lack of competitive intensity. Small advanced economies need strong productivity performance in the internationally oriented sectors in order to overcome low levels of productivity in domestic sectors. There is less cross-country variation in domestic sectors than in internationally focused sectors: it is the productivity performance in internationally oriented sectors (and the relative size of these sectors) that is the more important driver of variation in aggregate productivity performance across small advanced economies.

In small advanced economies there is a particularly sharp gradient in productivity levels between sectors that are internationally facing (such as manufacturing) and those that are domestically facing (such as retail and construction). Based on this sectoral distribution of productivity, frontier firms will likely be in internationally oriented sectors. There will be some exceptions, but in general the small size of the domestic market will tend to constrain productivity performance in domestic sectors.

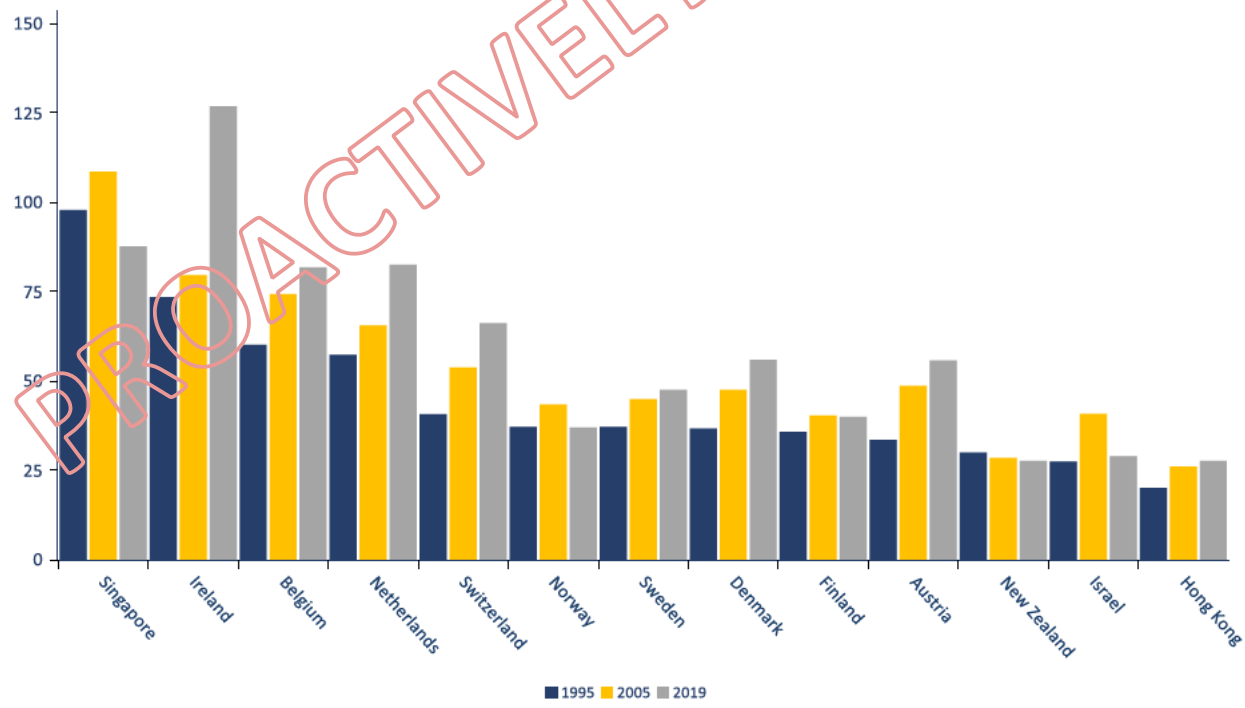
Indeed, high performing small advanced economies are characterised by high levels of international engagement. All of the cases of strong national convergence of small economies towards the global per capita income frontier over the past several decades have been due to strong increases in global activity (exports, outward direct investment), from Ireland and Singapore to Finland. And there is a strong

relationship in the time series between national (and world) export growth and productivity growth in small economies. Although the productivity of domestic sectors matter (from retail and construction to utilities), internationally oriented sectors are the productivity engines of small advanced economies.

Small economies have offset the productivity disadvantage due to small domestic markets by strong performance in internationally oriented sectors. Export shares in small advanced economies are 2x those in large economies on average (59% of GDP v 30% of GDP), with a similarly-size difference in the outward direct investment/GDP ratio. Small economies have grown these international shares significantly over the past decades, responding to stronger global competition and technological change, and moving into higher growth categories in the global economy (Exhibit 4). Often these internationally facing sectors are knowledge intensive in nature, and strong performance by small economies has rested on sustained investment in skills and innovation.

Exhibit 4: The export shares of many small advanced economies have increased materially over the past 25 years, although not New Zealand

Exports of goods & services, % of GDP, year to Q4 1995, 2005, 2019



Source: Macrobond, National sources, Landfall Strategy Group calculations. Note: Singapore = NODX (non-oil domestic exports) + exports of services; Hong Kong = exports of services only.

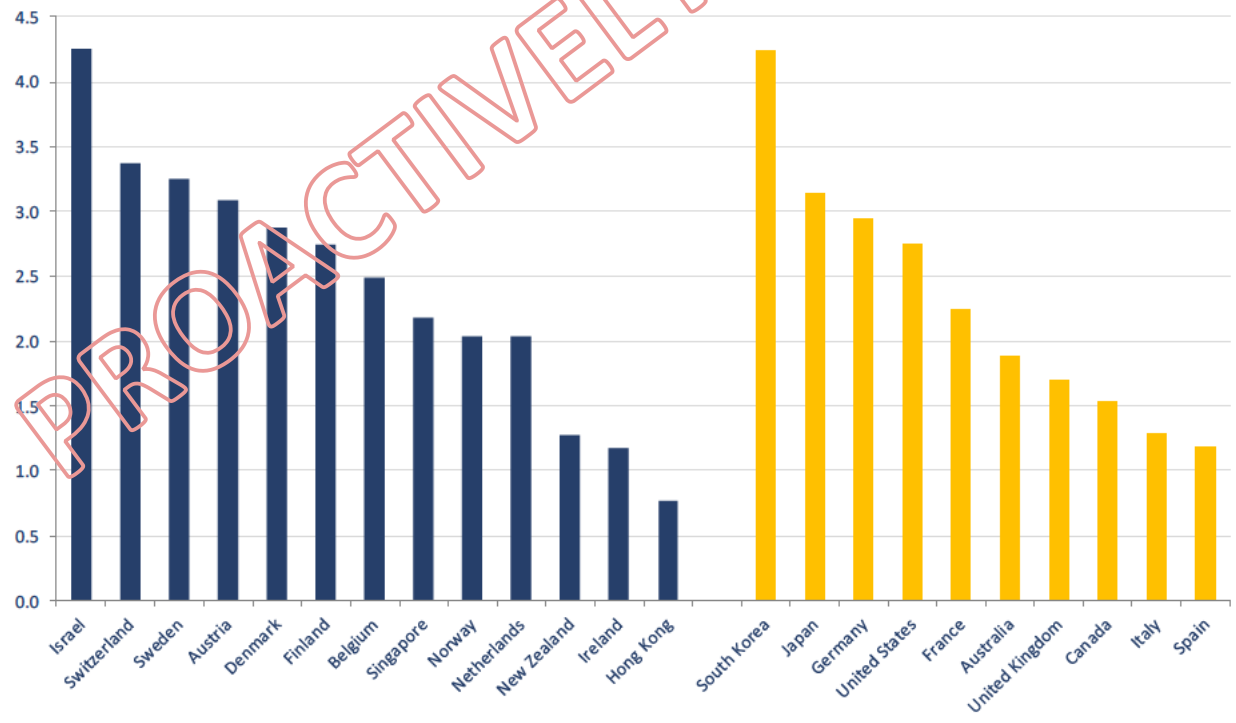
This international performance has been central to the strong economic performance of small economies. Variation in the extent and quality of international engagement maps well onto variation in national economic performance. In contrast, measures of 'policy quality' have far less explanatory power. Structural reform that improves the functioning of domestic sectors is likely to have a positive

effect on the national economy, but it is not the first order driver of productivity performance in advanced economies that already have reasonably good policy foundations in place.

Achieving high levels of international engagement is not simply the result of a passive process, due to intense globalisation and global growth, but requires deliberate policy support as well as firm-level capability and investment. High-performing small advanced economies have set policy to develop and support competitive advantage in internationally oriented sectors. It is notable that the top-performing small advanced economies all place a strong emphasis on skills and innovation in the design of their economic strategy (Exhibit 5). For example, economies like Switzerland, Denmark, and Finland have R&D spending around or above 3% of GDP (including high shares of business R&D spending). But the gap between small economies that invest a lot in R&D and those that invest a little has been widening over the past decade, suggesting a wider variation in competitive strength and productivity outcomes across small advanced economies into the future.

Exhibit 5: Several high-performing small advanced economies invest heavily in R&D, although there is variation across the group

R&D as a % of GDP, 2018 (or most recent available)



Source: Macrobond, OECD

Big firms in small economies

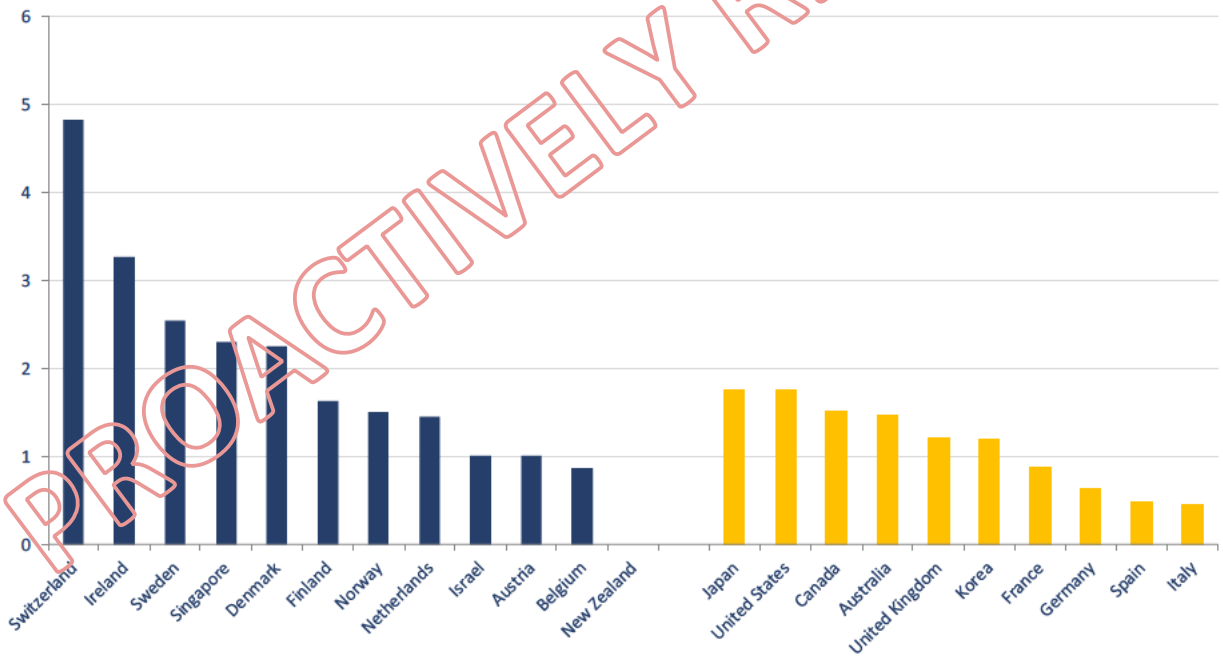
The international evidence shows that larger firms invest more in capital, spend more on R&D, pay high wages, are more likely to innovate and so on. As a result, large firms tend to be more productive – and

the growth in these firms makes a substantial contribution to aggregate productivity growth.[6] These large productive firms are disproportionately engaged in international activity. This is both a self-selection issue (internationally engaged firms need to be relatively productive to absorb the costs of international expansion, and to compete in international markets) and also because of the dynamic effects in which internationally active firms experience more rapid productivity growth (because they get to scale, benefit from learning by doing, and are exposed to more intense competition).

This seems to be the case in small advanced economies also. One of the striking characteristics of successful small advanced economies is their reliance on large firms, with a disproportionate representation of small economy MNCs in measures such as the Forbes Global 2000 (Exhibit 6).

Exhibit 6: Small advanced economies produce a significant number of large multinational companies per capita

Forbes Global 2000 companies per million population, 2019



Source: Forbes Magazine Global 2000, 2019, Landfall Strategy Group calculations. Note: Hong Kong excluded because of high number of Chinese firm listings.

It is these large small economy firms that have developed leading positions with respect to penetrating international markets. For example, Switzerland's innovative, internationally oriented activities often happen in large corporations (Nestle, Novartis, ABB, Swatch, Swiss Re, and many others). The basis for

[6] *For a recent discussion of the relationship between firm size and performance, refer: https://voxeu.org/article/macro-view-size-productivity-challenge-europe Refer also, McKinsey Global Institute, 'Outperformers: High growth emerging economies and the companies that propel them', September 2018; McKinsey Global Institute, 'The role of US-based multinational companies in US growth and renewal', June 2010; Chiara Criscuolo, Jonathan E. Haskel, Matthew J. Slaughter, 'Global Engagement and the Innovation Activities of Firms', NBER working paper 11479, June 2005.*

Denmark's economic dynamism and resilience is the many well-established firms in shipping (Maersk), pharma (Novo-Nordisk), renewable energy (Vestas), brewing (Carlsberg), as well as Lego, Grundfos, and others. The same is true in Finland, Sweden, the Netherlands, and elsewhere. Of course, these large firms are surrounded by small and medium-sized firms also, many of which are also successful in international markets, but these large firms make a disproportionate contribution to economic outcomes.

In contrast, a small economy economic strategy that relies too heavily on SMEs will be under-powered. A healthy ecosystem of firms is required, from large MNCs to high growth smaller firms, as well as a mix of small and medium-sized firms. But without large firms, aggregate productivity performance will likely be constrained. And there is a scale dimension to frontier firms, particularly in small advanced economies. Without international growth opportunities to get to scale, fewer frontier firms are likely.

Competitive clusters

Successful small advanced economies that generate strong economic performance at the frontier tend to have several pronounced clusters of firms organised around areas of existing strengths and capabilities. At the frontier, national innovation happens primarily within and adjacent to existing areas of strength, from pharmaceuticals in Switzerland to renewable energy in Denmark.

Clusters of related and supporting firms are an important engine for innovation and productivity growth, as well as international engagement. Deep, sophisticated clusters support innovation, tacit knowledge transfer, can better absorb shocks, and so on.[7] Clusters enable small economies (and small economy firms) to offset the absence of internal scale economies with external scale economies, such as strong backward and forward (supply chain) linkages, a deep pool of specialist labour, skills, and supporting firms, strong relationships with universities and research institutions, and so on. These external scale economies provide a powerful boost to firm productivity, particularly in knowledge-intensive activities.

The recent literature on economic complexity also notes that national growth processes are driven by capabilities (technology and know-how, tacit knowledge flows, networks, and so on) that are the basis for developing strengths in more complex, sophisticated goods and services. These new strengths will often be in adjacent spaces, into which existing capabilities can be readily extended. This again suggests the importance of dense clusters of related activities for innovation and productivity, allowing for capabilities to be combined and extended.[8]

Dense clusters are at the core of dynamic, resilient economies that operate at the global productivity frontier, such as Switzerland and Denmark. In countries where these clusters are less dense or

[7] *Masahisa Fujita, Paul Krugman, and Anthony Venables, The Spatial Economy: Cities, Regions and International Trade, MIT Press, 1999; Michael Porter, The Competitive Advantage of Nations, MacMillan Press, 1990.*
[8] *Ricardo Hausmann & Cesar Hidalgo, 'The network structure of economic output', Journal of Economic Growth, 2011; Ricardo Hausmann & Cesar Hidalgo, 'The building blocks of economic complexity', Proceedings of the National Academy of Sciences, 2009.*

sophisticated, or where they are limited as a share of the economy (Israel, Ireland), economic dynamism and resilience is constrained or seen in only particular parts of the economy (e.g. among foreign MNCs).

There is a well-developed literature around clusters, which often emphasise their geographic nature.[9] The term is used in a more informal sense in this paper to capture activities that are broader than a sector vertical, and which includes a set of related, supporting, and adjacent activities that together are material as a share of GDP, and from which frontier firms are likely to exist and to be developed. In this context, clusters are not a small, localised set of related activities, but something more like agriculture in the Netherlands, life sciences in Switzerland, or shipping in Denmark. This framing captures a coherent set of related activities, in which external scale economies exist, and which can make a material contribution to national productivity performance.

Across small advanced economies, international engagement and productivity performance comes disproportionately from these clusters. Internationally oriented firms are frequently embedded in deep clusters. For example, Switzerland (finance, pharma, precision engineering), the Netherlands (logistics, environment, agriculture and food), Denmark (shipping, renewable energy, pharma), Israel (high tech), Hong Kong (finance, logistics). These clusters provide a hard to replicate ecosystem, which increases the 'stickiness' of small advanced economies and provides economic resilience.

This 'stickiness' is a particularly valuable characteristics for small advanced economies, which are otherwise deeply exposed to agglomeration dynamics. A distinctive ecosystem that supports growth means that there are reasons for firms and skilled people to remain even if the domestic location is high cost or otherwise disadvantaged (e.g. by location as is the case for New Zealand). Clusters embed firms into small advanced economies (e.g. because of access to skilled labour, world-class research institutions, distinctive tacit knowledge flows), allowing for significantly more economic value to be captured in the domestic economy from firm growth (both directly by the firm, as well as indirectly through spillovers into the surrounding cluster).

These clusters will often be anchored by large MNCs. But the existence of these firms and the surrounding supply chains, specialised labour and capital markets, research and innovation infrastructure, and so on, also make it easier for small firms to grow rapidly towards the global frontier. Small, high growth firms will benefit from the presence of large firms and the surrounding context.

The importance of clusters is important in large economies as well, but they provide particularly important services in small advanced economies – supporting firm-level and aggregate productivity performance. But the challenge is that the small advanced economies only have the national scale to achieve critical mass in a limited number of internationally oriented clusters.

[9] *Refer for example Christian Ketels & Sergiy Protsiv: "A cluster is a regional concentration of economic activities in related industries, connected through multiple types of linkages. It includes companies of different types, including suppliers, service providers, and producers of final products and services, as well as other innovation actors, such as research and educational institutions, specialised government agencies, financial actors and many other organisations that provide relevant services or in different ways connect the different elements of the clusters"; 'Methodology and Findings Report for a Cluster Mapping of Related Sectors', European Cluster Observatory, October 2014.*

Indeed, small economies tend to have relatively concentrated export structures, reflecting the reality that small economies cannot be world-class in everything: resource constraints allow for only a limited number of clusters to get to the critical mass required to sustain leading positions in global markets and to deliver the valuable services described above. Informal examination of the competitive strengths across high-performing small advanced economies from Switzerland to Sweden and Finland shows that their competitive strengths lie in a limited number of areas (but which generate substantial economic value to the economy). Isolated groups of firms are less likely to generate economic value on a sustained basis, as there will be constraints on external scale economies and the extension of capabilities into related areas.

In many small economies these strengths will be well-established, and the clusters will have formed organically around areas of competitive strength. Of course, there are trade-offs involved. A high level of reliance on a limited number of clusters can introduce risk into the economy (the Nokia effect). An idiosyncratic shock can lead to a significant macro shock. However, with too much diversification across clusters in a small advanced economy, risk exposures can also be created: the risk that firms and clusters do not get to the productivity frontier, because sufficient external scale economies are not created due to the absence of critical mass.

Summary

In short, international engagement is the productivity growth engine of firms (and the overall economy) in small advanced economies, and this commonly rests on high-performing clusters of internationally oriented firms.

Deep clusters will likely become even more important in periods of economic disruption, supporting more rapid innovation by firms. In a context of intense global competition and winner-take-all dynamics in some sectors of the global economy (such as activities with platform characteristics, such as Amazon, Alibaba, and Google), these small economy clusters in continue to support the global competitiveness of firms from small advanced economies. Indeed, the historical record of small economies is that they have been able to deploy disruptive technologies in ways that have strengthened the productivity of their economy (as seen from the mid-1990s with the deployment of ICT and the shift into knowledge intensive activities).

The characteristics of high-performing small advanced economies discussed in this section provide a sense of where frontier firms are most likely to be found in small economies like New Zealand. These characteristics can be shaped by sustained policy action – as seen in small economies from Finland to Ireland and Singapore. Indeed, this economic policy focus is an important reason for the strong performance of these small economies.

3. Implications for New Zealand

This section considers New Zealand's performance on these dimensions that are associated with strong productivity performance – and frontier firms – in small advanced economies. It turns out that there are some substantial gaps between New Zealand and high-performing small advanced economies on these

dimensions, which will contribute to New Zealand's relatively weak productivity performance and the relative absence of frontier firms in New Zealand.

Internationally oriented sectors

New Zealand has the lowest export and outward direct investment shares of GDP of all the small advanced economies. At 28% and 8% of GDP respectively, this compares with an average of 59% and 84% across the small advanced economy group (even after stripping out the outliers of hub economies like Hong Kong and Ireland).

New Zealand's export share of GDP has not changed meaningfully over the past few decades; it is currently the same level as it was in the early 1980s. Despite some fluctuations due to variation in the strength of external demand, the exchange rate, and so on, the trend line has been flat. This is in contrast with most other advanced economies where the export share has increased, particularly in the 15 years prior to the global financial crisis (Exhibit 4).

Similarly, there has been little change in the composition of New Zealand's exports over this period (with the exception of tourism and export education). There have been some shifts within the primary sector (less wool, more dairy, more wine and horticulture), more of which is branded and consumer facing. But there is relatively little evidence of major new strengths in New Zealand's export footprint, compared to the scale of transformation seen in the export structures of other small advanced economies over the past few decades.

Across many other small advanced economies, the increase in small economy export shares from the mid-late 1990s was supported by a greater intensity in research and innovation, enabling small economies to develop strong positions in knowledge intensive sectors. Finland is a classic example of a small economy that deliberately invested in skills and innovation from the early 1990s to develop new sources of competitive advantage. This supported a transformation in its export structure, away from commodities and relatively basic manufactures to increasingly sophisticated industries and technology.

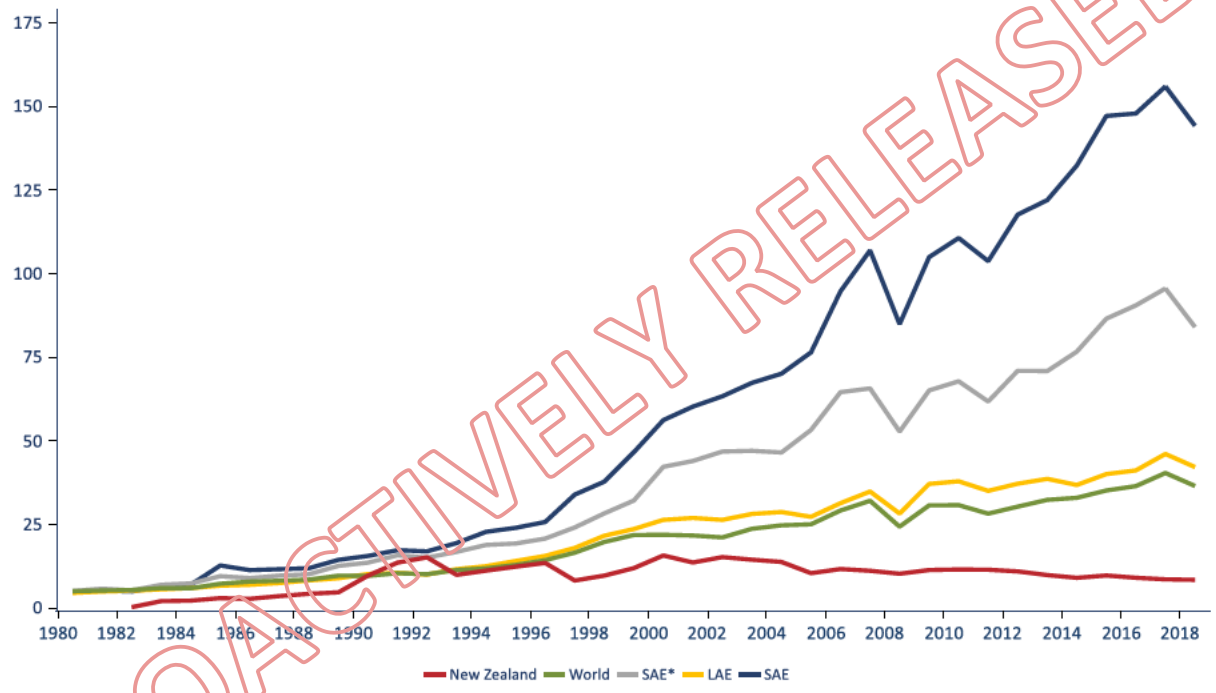
Of course, the external sectors of the New Zealand economy are constrained by physical remoteness from key export markets. This, combined with the characteristics of New Zealand's export structure (such as a low import content of exports), go some way to explaining New Zealand's relatively low export share. But New Zealand's economic geography and structure are not grounds for fatalism: other (slightly peripheral) small advanced economies, from Finland to Israel and Ireland, have been able to transform their international economic engagement model – moving from relatively unsophisticated exports into higher growth, knowledge-intensive international activities. In any case, despite the clear difficulties with respect to international expansion from New Zealand, international economic engagement remains the key channel for strengthening productivity.

New Zealand's outward direct investment (ODI) record is even weaker. The ODI/GDP share is very low at 8% and has been declining since the mid-1990s (Exhibit 7). This is partly because several of the big international expansions over the past 20 years (Air NZ, Telecom, The Warehouse, Fonterra) have

resulted in write downs and disinvestment. There have been few big foreign investments over recent years.

Exhibit 7: New Zealand's outward direct investment share has declined slightly since the mid-1990s, the opposite direction from other economies

Outward direct investment stock, % of GDP, 1980 - 2018



Source: Macrobond, IMF, UNCTAD, Landfall Strategy Group calculations. Note: SAE excludes Hong Kong, Ireland, and Singapore.*

New Zealand's relatively weak record of international engagement constrains the potential for the development of frontier firms. Only a relatively small number of New Zealand firms have exposure to growth opportunities, to the flows of knowledge and ideas, and to the competitive intensity, that are present in global markets – and which are necessary to support the development of frontier firms. Small economy firms cannot build the capabilities or the knowledge to become more productive without deep, sustained international engagement. Limited international engagement also goes some way to explaining New Zealand's low business investment rates; New Zealand firms are only investing to serve the domestic market, which also constrains productivity growth.

Big firms

New Zealand has some large, established internationally oriented firms from Fonterra, Zespri, and the meat companies, to firms such as F&P Healthcare and Datacom. And New Zealand has some large, high growth companies like Xero and A2 Milk.

But relative to other small economies, New Zealand does not have many firms of global scale. New Zealand doesn't have a single entry on the Forbes Global 2000 of the world's largest listed firms (refer Figure 6). And the size of New Zealand's largest firms as a share of GDP is low relative to other small advanced economies. This is distorted a little because of the non-listed nature of some large firms in the primary sector, but it does suggest that New Zealand is under-represented in terms of large firms.

Indeed, of the top 10 listed New Zealand firms on the NZX, four are domestic utilities (Meridian, Mercury, Contact, Vector), two are largely in a domestic sector (Spark, Ryman Healthcare), two are international infrastructure (Auckland Airport, Ports of Tauranga), and only two compete in global markets at scale (F&P Healthcare, A2 Milk). The 'New Zealand champion' firms of 20-30 years ago – such as Fletcher Challenge and Carter Holt Harvey – have been split up and reduced in size. And the growth aspirations of firms from Air New Zealand to the Warehouse and Telecom have been dialled back, partly because their international expansion experiences were not successful.

New Zealand's large firms are more likely to export than smaller firms, and tend to get a greater proportion of their overall revenues from international sources. New Zealand's export revenues are heavily concentrated according to data from Statistics NZ: in 2019, 33 firms accounted for over 50% of New Zealand's exports of goods and services. And only a small number of firms export at scale: only 297 firms were reported to export more than $25m a year. Beyond this, there are a larger number of relatively small or 'opportunistic' exporters. This profile has not changed much over the past 20 years.

Bluntly stated, there aren't enough large firms exporting at scale and too few smaller firms that are growing rapidly by expanding strongly into international markets. New Zealand is sometimes described as a trading nation, but the reality is that only a small number of firms are internationally engaged at scale in New Zealand.

Large parts of New Zealand's international sectors are in ownership structures that constrain the type of growth that are seen in other economies (even in the same sector). The co-operative structure constrains risky investments, and makes it more likely that the product mix skews towards commodity. There are persistent concerns about the performance of these large firms in the primary sector; they are not acting as the growth engines of the New Zealand economy, or anchoring innovative, high productivity activity in clusters. There have been some improvements over time, but New Zealand has not produced the primary sector MNCs seen elsewhere. The constrained growth of large firms also dampens the growth of other firms in related activities.

New Zealand's firm structure is striking less for the number of SMEs, which is the case across most advanced economies, than for the absence of large firms. This absence leads to an under-powered economic structure.

There are many high growth companies, but as a percentage of GDP these firms (in aggregate) have not yet shifted the economic needle. Xero is a great success, but it remains an exception in terms of the scale and pace of growth. Many of New Zealand's high growth companies have not scaled; they are growing strongly off a relatively low base. New Zealand does not currently have the strong pipeline of

high growth firms that are required to make a material difference. As a matter of arithmetic, 100% annual growth in 20 $100 million turnover firms are required to match 10% annual growth in a $20 billion turnover firm like Fonterra.

Competitive clusters

The highest-potential areas of the New Zealand economy in which frontier firms can be developed are in internationally oriented clusters, where external economies of scale exist. But relative to other small advanced economies, New Zealand does not have innovative, high-growth clusters around its major areas of historical comparative advantage; and needs to grow its emerging clusters to scale in order for them to make a material contribution to New Zealand's productivity performance.

Some of the characteristics that we would expect to see in high performing clusters (in addition to outcomes such as high productivity and export growth) include strong research institutions that are linked to commercial activity; evidence of innovation; a high quality advisory ecosystem; the attraction of foreign investment and talent inflows; and so on.

New Zealand has some of this (agricultural research institutions, foreign talent coming into New Zealand's digital sector) but not enough. Outside of the primary sector, the successes are more idiosyncratic rather than systematic – and are not associated with deep and broad strength and capability. Over time, of course, these successful firms will contribute to building the foundation for a broader cluster to emerge. But this will take time, investment, and deliberate policy action (to be discussed in the section below) for this initial success to be developed into a cluster.

4. An agenda for action

New Zealand's weak productivity performance at national level and the relative absence of frontier firms is largely due to a low level of international engagement by firms growing at scale out of deep, innovative clusters. This analysis provides the basis for a discussion of the classes of policy action that can strengthen the performance of New Zealand's frontier firms.

To generalise, New Zealand's historical policy approach has focused on attempting to raise productivity across the economy without a sharp distinction drawn between domestically and internationally oriented sectors. The policy focus has been on efficiency of resource allocation, the quality of the business environment, as well as human capital, infrastructure, and so on. But this approach has not generated the desired economic outcomes: productivity levels still lag economies that have similar or inferior policy foundations.

On many of the standard classes of policy advice (e.g. from the OECD), New Zealand is relatively well-placed. As has been noted frequently, including by the Productivity Commission, New Zealand ranks near the top on most measures of policy foundations. Although improvements are always possible, and New Zealand should aim to be close to the policy frontier in order to offset other disadvantages, the

relative quality of policy foundations does not explain New Zealand's substantial productivity performance gap.[10]

Rather, New Zealand's weak productivity performance and the absence of frontier firms is largely due to constraints on New Zealand firms developing competitive advantage in global markets. This is where there are the most pronounced gaps between New Zealand and high-performing small advanced economies.

On the basis of this analysis, I identify four areas of policy action: a strategic focus on internationally oriented sectors; a focus on key clusters in which frontier firms are most likely to be developed; policy measures to improve the competitiveness of firms in global markets; and addressing firm-level capabilities and incentive structures to the extent possible.

International focus

Policy to strengthen frontier firms – and to boost aggregate productivity performance – should be focused on internationally oriented strengths. These are clusters in which New Zealand firms can get to scale through exporting goods and services (including IP) as well as outward direct investment. Even if a domestic firm/cluster is at or close to the global productivity frontier, to make an ongoing contribution to productivity growth resources need to be drawn into this activity from lower productivity uses elsewhere. This requires the growth opportunities only available in international markets.

This policy focus should be disproportionate not exclusive; policy can also support firms to move towards the frontier in domestic sectors. But firms in domestic sectors operate in a constrained environment that make strong, sustained productivity performance less likely. Moving productivity in sectors like construction towards the global frontier will be challenging in small economies like New Zealand. Of course, improvements can and should be made (e.g. modular construction, greater use of digital in the delivery of services), but the benefits will be limited by the small scale of the domestic market.

A deliberate policy focus on international sectors would be a marked shift away from New Zealand's current agnostic policy approach which treats international and domestic sectors in the same way. But international sectors have disproportionate importance in small advanced economies, and should be approached accordingly. New Zealand's productivity agenda should be organised around these activities.

[10] *The one policy foundation setting that I identify as having had a meaningful impact on New Zealand's productivity performance and the development of frontier firms is with respect to immigration (or more precisely, the absence of a strategic migration policy). The substantial net migration inflows that New Zealand has received over the past 25 years has been a strong source of support for headline GDP growth, but has created a series of distortions and pressures in the New Zealand economy: infrastructure and cost pressures, greater residential real estate demand (with implications for allocation of investment capital), downward wage pressure that deters business investment, as well as upward exchange rate pressure. An explicit immigration policy that was focused on quality and filling skills gaps, with lower gross inflows, would create a more supportive environment for higher levels of international engagement by New Zealand firms (although the transmission mechanism to outcomes is more indirect than those discussed in the body of this paper).*

There are of course concerns with respect to the current outlook for globalisation, and that a lower risk approach would be to focus on strengthening the domestic economy. On various measures, the intensity of globalisation has flattened off since the global financial crisis – and there are a range of future challenges, from trade wars to the growing fragmentation of the global system. Coronavirus will likely reinforce these challenges. But my assessment is that globalisation is changing not reversing, and there will be areas of global growth for New Zealand (such as in knowledge-intensive services).

In any case, small economies cannot turn away from an open economy model. Rather the challenge should be to adapt to these new realities, and to build positions of competitive advantage in specific parts of the global economy. Because this will be demanding, the need for a concerted policy agenda on these activities is even more important. Improving New Zealand's international engagement is core to any material improvement in national productivity performance.

Strategic cluster focus

The small advanced economy experience points to the importance of deep clusters that can support the growth and productivity performance of large firms as well as small and medium sized firms. In small economies, there will only be a limited number of these clusters that can get to critical mass and support sustained world-class competitive performance by frontier firms. The implication is that economic policy needs to be more deliberately focused on a small number of high potential clusters rather than being thinly spread.

To deliver a material contribution to aggregate productivity growth, and to support firms that can acquire the scale necessary to become a frontier firm, these need to be relatively large and dense clusters. The key filters to use in making this choice include: the materiality of the sector (e.g. % of GDP); sectors where there is a demonstrated position of competitive advantage in global markets (share of global market, or growth in the global share); and where there are large and/or high growth firms at work in the sector that can anchor these clusters in New Zealand.

Note that this is a very different way of approaching clusters than is standard in much of the New Zealand policy discussion. Often target clusters are very small in scale and local in nature. The focus here is on large clusters of related activities and capabilities that comprise large shares of the export base. At some point, focused policy interventions are required, but it is vital that there is an explicit materiality focus in terms of the desired outcomes. Otherwise, even if these initiatives are successful, it is unlikely that they will make a material difference to New Zealand's productivity performance.

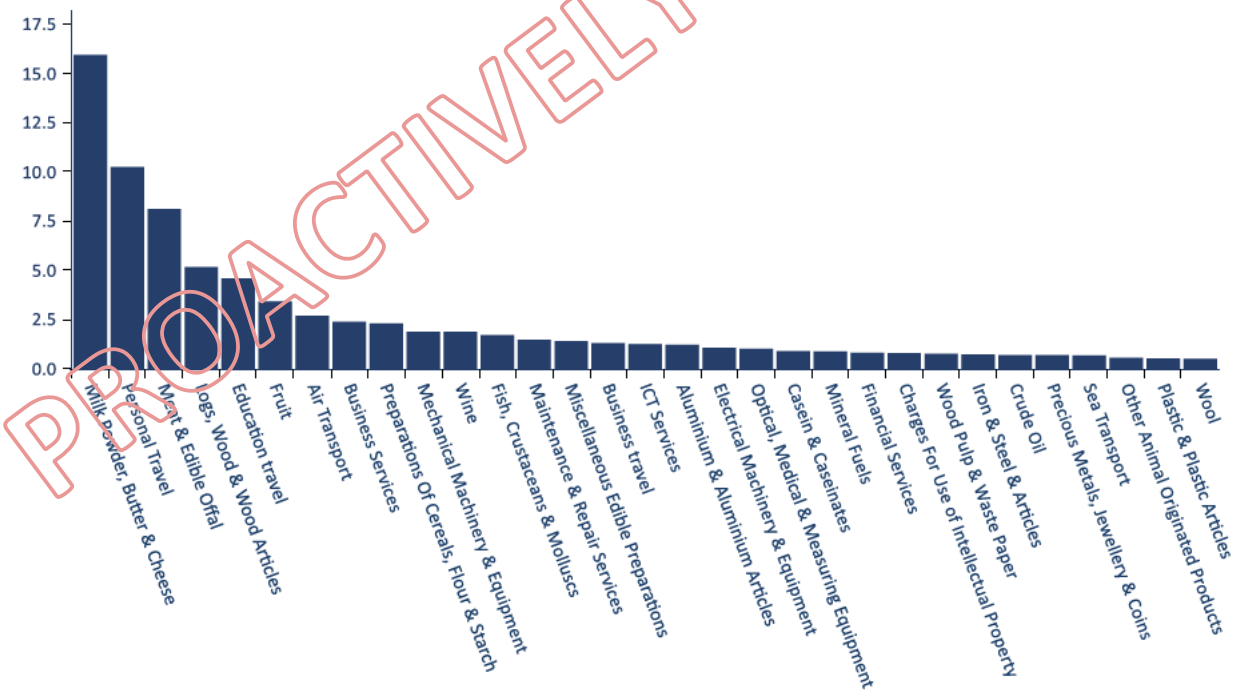
An objective of raising productivity levels by (say) 20% over a decade, or to move 20% of New Zealand's GDP much closer towards the global productivity frontier, require a policy approach at scale. An objective of transforming large parts of the primary sector, or developing the weightless economy such that multiple Xero-type companies grow into international markets, requires structural policy interventions rather than cluster-based policy that is focused around small, local clusters. The resourcing allocated to the Provincial Growth Fund ($4b) or parts of the unallocated Covid-19 Response

& Recovery Fund ($39b) is a more appropriate scale for this type of policy than much existing enterprise policy; and more in line with the policy experience of many high-performing small advanced economies.

Looking across New Zealand's export structure, there are only a few broad areas in which New Zealand has some critical mass and a measure of competitive advantage in global markets (Exhibit 8). These are: the primary sector (broadly defined, from dairy and red meat to wine, horticulture, as well as adjacent sectors in agritech); people flow industries (tourism, including export education); and weightless activities (creative, digital, professional and financial services, etc). Of New Zealand's $86 billion in exports in the year to December 2019, around $32.5 billion came from dairy, red meat, forestry, and fruit; around $30 billion came from travel and transport (including a $4.6b contribution from export education); and $7.6 billion came from weightless services (very broadly defined to include all exports of services excluding transport and travel; the major categories of these exports can be seen in Exhibit 8).

Exhibit 8: The primary sector and tourism dominate New Zealand's export structure

Top 30 export categories, NZD billion, year to December 2019



Source: Macrobond, Statistics NZ, Landfall Strategy Group calculations

Cross-border people flows are likely to be deeply challenged in the post-Covid19 environment; and the tourism sector also tend to have low productivity levels and growth rates. So as a starting point, the focus should be on supporting the development of competitive advantage and productivity performance in the primary sector; and the 'weightless economy', which includes activities such as digital, creative, professional and knowledge-based services.

In the near-term, improvements in the primary sector are most likely to make a material contribution to national productivity performance. The primary sector (dairy, red meat, forestry, horticulture, wine, and so on) is the dominant part of New Zealand's export structure (ex tourism) and has several at-scale international firms. Indeed, unleashing the performance of this sector is critical, given New Zealand's economic structure: if it is not performing at full potential, it will act as a drag on New Zealand's overall productivity performance. Further prioritisation within the primary sector will be necessary to guide policy – not every activity has the same potential – but it is clear that improved productivity performance in this sector is central to a material improvement in national productivity performance.

The weightless economy encompasses a wide range of activities, brought together by similarities in the delivery model (using digital technologies), which reduce the constraints on expansion into global markets from a physically remote New Zealand base. Parts of the weightless sector are growing quickly but it remains a relatively small part of the export structure and overall economy: exports of these activities have approximately tracked exports from the meat sector over the past 20 years. But this sector holds significant potential for New Zealand, as it is less sensitive to location and has strong global growth prospects. Firms like Xero and Datacom show what is possible in knowledge-based activities.

However, the flipside of the ability to locate weightless economic activity anywhere in the world is that New Zealand also needs to be a compelling location: there needs to be strong external scale economies in the key clusters so that this activity is sticky in New Zealand, allowing for economic value to be captured. Without the stickiness of talent, capital, and knowledge, these weightless firms will often be drawn to other locations. But the success cases to date have tended to be idiosyncratic rather than systematic in nature. The policy priority is to create the conditions in which at scale commercial success become much more frequent and mutually-supporting, building a dynamic and resilient cluster.

Organising policy around strategic clusters, even when defined as broadly as in this paper, is a marked departure from the economic policy approach in New Zealand over the past few decades. But this should not be caricatured as picking winners; rather it is a structured approach to strategic prioritisation of policy and resource investment – organised around 'backing winners' in areas where New Zealand has demonstrated global competitive strength or potential. There are only a handful of areas in which this is the case, and the decision-making process should be a practical one.

Small economies are 'doomed to choose' if they want to be successful. And New Zealand's current choices have not delivered the outcomes we want. The risk of a level playing field approach that 'lets a thousand flowers bloom' is that it yields a thousand dead flowers, because firms do not have the topsoil of a surrounding cluster in which to grow to become frontier firms. Too much diversification increases the risk of an absence of economic dynamism and resilience, with sub-par productivity performance. Some 'thickening up' of the economy around key areas of competitive strength is necessary for productivity performance and the development of frontier firms. Of course, it is important to put commercial disciplines and structures around these policies both in terms of the process for backing winners as well as withdrawing support from ('killing') the losers that do not work out.

The bigger risk in New Zealand is of the 'sub-therapeutic dose' to industry policy, in which resources are allocated to sub-scale initiatives that do not deliver meaningful or sustained impact. There have been many initiatives over the past 20 years to support various parts of the economy, from forestry to film-making. And there are currently industry transformation plans being developed for various sectors. But these often lack a focus on building the critical mass in key clusters that New Zealand needs to develop frontier firms. To make progress, the right materiality of ambition is required (percentage points of GDP, not a few extra million dollars of exports); a focus is required on the cluster as opposed to very specific activities; and a structural, whole of government policy agenda is needed (skill, infrastructure, research, FDI attraction, and so on) rather than some financial support. This should be done properly or not at all. And importantly, choices will need to be made in terms of what not to do.

Policy instruments

Once these choices are made, determined, aggressive policy is required. This is particularly the case because there are some material challenges and opportunities confronting New Zealand's primary sector, such as the growing consumer focus on emissions intensity. The urgency of these competitive dynamics is reinforced by the severe economic shock of Coronavirus. New Zealand's priority areas of activity need to be upgraded to respond to emerging competitive pressures, from new alternatives to red meat and dairy to intense competition from everywhere across the weightless economy. If New Zealand cannot capture opportunities and manage risks in these important clusters, the ability to strengthen New Zealand's aggregate productivity performance and to develop frontier firms will be weakened in a material way – and significant downside risks will emerge.

There are two categories of policy instrument that are discussed below. The current set of policy foundations in New Zealand, which – broadly speaking – provide support for productivity growth, are taken as a given.

- *Strategic policy*

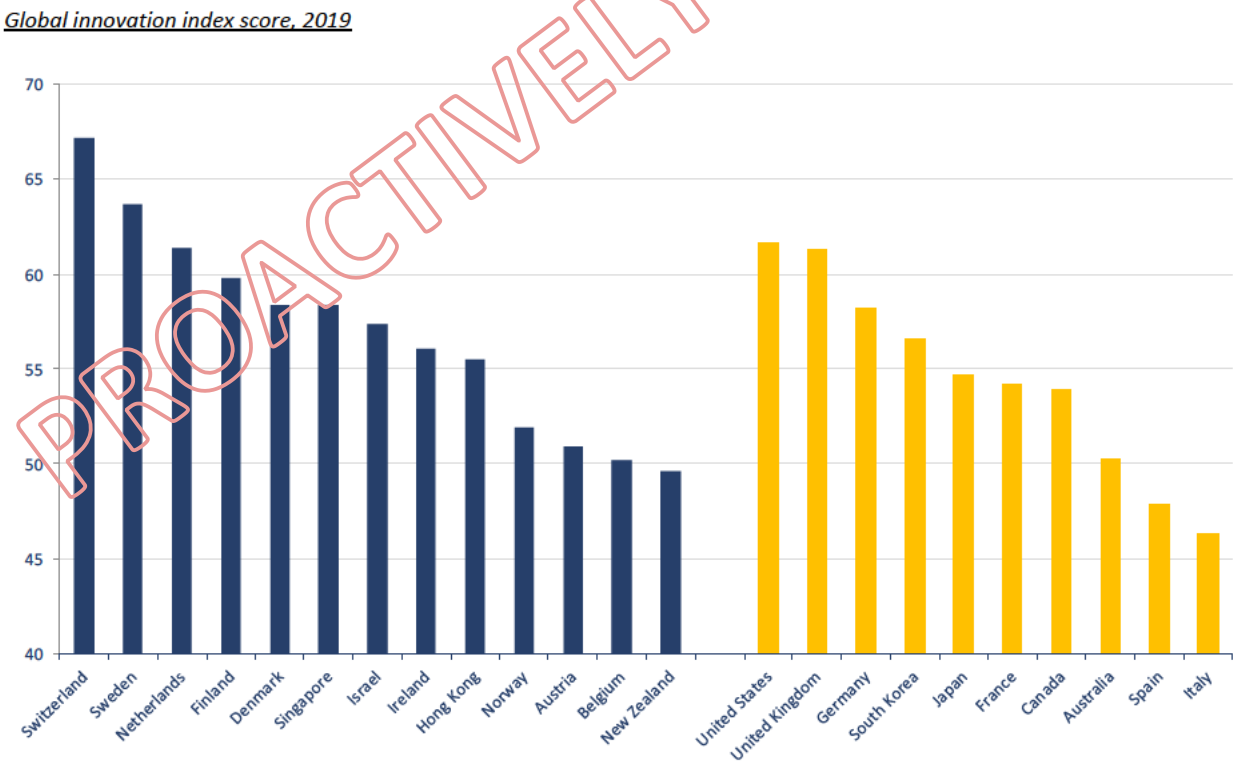
Strategic policy instruments are measures that strengthen the competitive positioning of the cluster in the global economy. The international small advanced economy experience shows clearly that economic transformation – and particularly the transformation of internationally oriented sectors – rests on the investment made in skills and innovation. Frontier firms are generally heavily knowledge based. There are very few examples of small advanced economies approaching the productivity frontier without high levels of investment in skills and innovation.

Most small advanced economies see skills and innovation policy as central aspects of their economic strategy. And looking forward, the increasing pace and intensity of global competition, disruptive technologies, and increasingly skill-biased technical change create an imperative for further upgrading strategic investment in skills and innovation. My assessment is that skills and innovation capability will increasingly shape national economic performance. The relationship between skills, innovation, and economic outcomes is even sharper for small advanced economies given their deep exposure to the global economy.

A deep pool of human capital is increasingly central to productivity and income growth, and to making a small economy location 'sticky' for mobile labour and capital. These investments in skills and innovation should be integrated into a broader economic strategy that embeds specific skills and innovation capability into distinctive clusters in order to guard against small economy exposure to the international mobility of this skilled labour. Otherwise investing in a country's most mobile factors of production (skilled people, innovative firms) may simply lead to a greater risk of exit from New Zealand.

This commitment to skills and innovation is a key missing element from the support of New Zealand's clusters. New Zealand's overall level of R&D spending (1.4% of GDP), and particularly business R&D spending (0.6% of GDP), is low relative to other high-performing small advanced economies (Exhibit 5). R&D spending is only a proxy for this investment, but it is difficult to deliver innovation without investing in R&D. Indeed, New Zealand ranks poorly on several broader measures of innovation performance (Exhibit 9).

Exhibit 9: Small advanced economies dominate the top 10 of the global innovation index; New Zealand is towards the bottom



Source: Global Innovation Index 2019

Despite the wealth of expertise across the primary sector, the extent of innovation is relatively low. R&D spending in the sector is low, for example. The New Zealand experience contrasts with the Dutch agricultural system, the second largest agricultural exporter by value – despite a small land mass – with deep linkages to universities and research institutions, and the development of a strong cluster. There

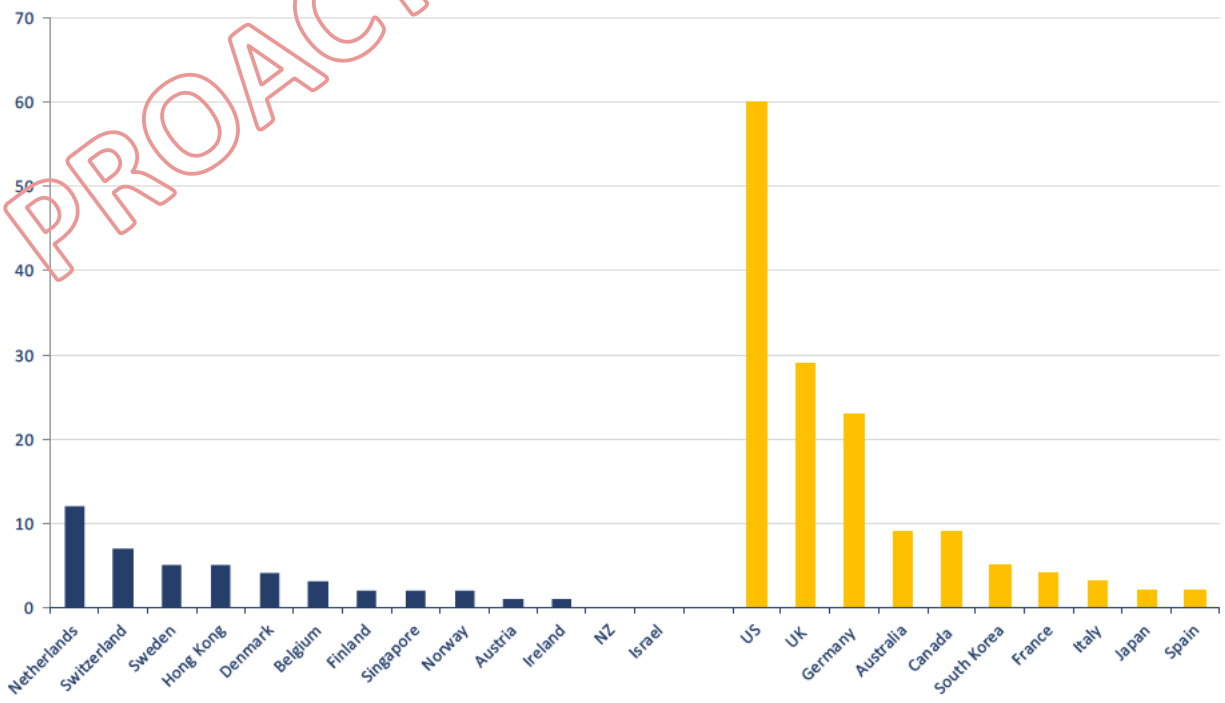
should be opportunity to significantly enhance the knowledge and innovation intensity of New Zealand's primary sector, as well as to grow technology-intensive activities in adjacent spaces.

There is a need for a substantially stepped up investment in skills and innovation, with a particularly focus on these priority clusters. New Zealand's R&D investment (public and private sector) should be increased to the levels seen in other high-performing small advanced economies (~3% of GDP v New Zealand's current 1.4%). This can be done through direct investments (e.g. mission-led research), sustained investments in research institutions and universities so that they are in a position to undertake world-leading research and education particularly in areas that relate to New Zealand's strengths, as well as financial support to firms (tax credits, direct grants).

Research universities are an important part of this process. Successful small economies are notable for the number of world-class universities they have, as measured by the admittedly imperfect international rankings (Exhibit 10). And there is frequently a strong relationship between universities and the key clusters (e.g. Switzerland, the Netherlands). The quality of the research sector, and its linkage to these priority areas, should be stepped up very considerably in New Zealand – particularly given that it is currently lagging on many of these measures.

Exhibit 10: Several small advanced economies perform strongly in university rankings, notably the Netherlands (12) and Switzerland (7)

Number of universities in Top 200 World University Rankings, 2019



Source: Times Higher Education World University Rankings

These investments should also be a priority for firms as well. Much research and innovation in small advanced economies is business-financed, taking place in large firms. That is not currently the case in New Zealand, where business financed R&D spending is very low.

There are major competitive challenges and opportunities facing New Zealand's sector, as global consumers increasingly focus on lower emissions substitutes for dairy and red meat. Demand for alternative sources of protein is growing rapidly, and the New Zealand agriculture sector will need to respond: moving more rapidly into the premium end of the sector, reducing emissions intensity of production, developing new products that meet consumer demand. Innovation and technology will become a significant part of the solution for the New Zealand industry. An analogy is the response of the Swiss watchmaking industry in the 1970s when confronted with quartz technology; firms in the cluster invested heavily, drawing on surrounding capabilities in precision engineering, and built a position of stronger competitive advantage.

- *Sector-specific policy*

Policy should also address the binding constraints on growth in these clusters in order to create a platform for productivity growth and the development of frontier firms.

There seem to be binding constraints on firm growth in significant parts of the agricultural sector. For example, in the dairy sector, the ownership, capital structure, and governance arrangements act as a constraint on international expansion. Farmer owners are often risk averse on international expansion, there is a lack of clarity between the commodity business and the consumer branded businesses (induced partly by DIRA), capital is not available to support international expansion, and there are ongoing issues regarding capability. The Fonterra model, intended to create a national champion for New Zealand, has not yet fully achieved the desired results. But there are some positive signs in the broader cluster: A2 Milk has become one of the largest listed companies on the NZX.

For the weightless sectors, there have also been issues around industry structure in the supply of infrastructure. For example, the arguments I made for government investment in fibre to the home (now UFB) – and structural separation of Telecom – from 2007 were to support the development of a weightless economy in New Zealand.[11] The argument was that having world-leading fibre infrastructure was an important element of allowing digital and other businesses to be productive and competitive from a New Zealand base. New Zealand now has world-class fibre infrastructure, and this is a source of competitive advantage for firms in the weightless cluster as well as more generally through the economy (as seen with the experience through the Coronavirus lockdown, when remote working models were readily adopted).

In addition to the investment made in fibre, the weightless economy also needs significantly increased research and innovation funding in specific areas where New Zealand is developing competitive advantage. And consideration should be given to the roll out of the 5G network (industry structure,

[11] http://www.stuff.co.nz/technology/312511/NZ-on-wrong-broadband-path;

geographic reach, and so on), to ensure that the deployment model for this new technology learns the lessons from the deployment of fibre.

Firm-level capability & incentives

Lastly, it is important to note that some constraints on the growth of frontier firms in New Zealand are due to the characteristics and behaviours of the private sector. These constraints can be only indirectly shaped by policy; meaningful progress on these dimensions will require changes in private sector behaviours. There are several private sector characteristics of the private sector that are important.

First, a key reason for the absence of business investment in expansion into international markets is that there are weak financial incentives. The returns available to domestic firms (utilities, retail) tend to be higher than in international markets, partly due to the lower levels of competitive intensity in New Zealand. And the record of New Zealand firms expanding into global markets is not good, with numerous high-profile examples of shareholder value destruction. It is seen as easier to generate good risk-adjusted margins (and dividend yields) by staying in New Zealand. As a consequence, boards and management teams tend to be cautious about international expansion – and capital markets tend not to be supportive of financing international expansion.

Combined with the absence of domestic competitive pressure to expand, this means that New Zealand firms do not expand into international markets to acquire the scale and growth opportunities necessary to become a frontier firm. Without an incentive to develop competitive positions in global markets, the incentive to invest in capital, technology, and R&D is constrained by the size of New Zealand's domestic market.

Second, to capture value from strong firm growth, ownership is important. Although there is much more capital available in New Zealand (due to policy initiatives such as KiwiSaver, the NZSF, NZVIF, and so on), prospective frontier firms are often 'lost' to New Zealand – being bought out by foreign firms, and subsequently relocating to bigger markets, as they successfully expand. These firms will often contribute to the productivity performance of another country.

Third, there are issues relating to management capabilities in New Zealand firms. International expansion is challenging in general, which is why only a small proportion of firms in any economy undertake sustained exporting or overseas direct investment. It is particularly challenging from a geographically remote location like New Zealand, where the cost and risk profile is higher again. And because there is not a large community of experienced managers and directors that have been engaged in running or growing an international business out of New Zealand, there are relatively few ways in which to receive on the job training. Firms need to be investing more in building the capabilities that will support innovation and international growth.

Lastly, aspiration. There is not a culture of building global companies from New Zealand to scale. This argument is hard to pin down precisely, and is likely less true than it used to be.

These four constraints were initially identified in research I undertook at The New Zealand Institute in 2006, on the basis of a series of interviews with management and directors of New Zealand listed firms, as well as investors.[12] Some progress has been made: there are larger pools of domestic capital; stronger management capability, and some evidence of increased aspiration around expansion into international markets. However, there is a long way to go.

In particular, issues remain with respect to the incentives to invest to strengthen productivity. Few large firms face competitive pressure to invest heavily in research, new technology, or expansion into international markets. If anything, this pressure has intensified; New Zealand firms are retrenching from offshore investments (such as Fonterra) and there have been strong returns in the domestic market.

In sum, private sector behaviours are an important reason for the relative absence of frontier firms in New Zealand. The various policy initiatives outlined above, such as focused investment in skills and innovation and resolving sector-specific constraints, will contribute to changing incentives by raising the potential returns in offshore markets. Government policy can also contribute to addressing firm-level incentive and capability issues through measures such as further strengthening capital markets, supporting business education, enterprise policy, and so on. But the nature of decision-making by firm leadership and capital markets also needs to respond, from changing the risk tolerances and time horizon of investment decision-making to strengthening capability around international expansion.

5. Concluding remarks

The international small advanced economy experience provides insight and guidance for New Zealand with respect to the drivers of productivity growth and the development of frontier firms. There are several clear differences in the economic structure and policy approaches between New Zealand and high-performing small advanced economies that are instructive for a productivity policy agenda.

Given New Zealand's existing economic structure and policy settings, the resulting context and incentives will likely continue to result in weak productivity outcomes with relatively low levels of international engagement, investment, and innovation – and few frontier firms. Without deliberate policy change, it is likely that New Zealand will have another two decades of debate about economic transformation, and some further policy initiatives, but without achieving impact.

A structural policy change is required, and this firm-based approach to developing a policy agenda is a high potential way to proceed. Linking the policy agenda to the micro-structure of the New Zealand economy in terms of clusters and firms will improve the transmission mechanism between policy choices and outcomes in the real economy.

My assessment is that deliberate choices need to be made on a policy approach that will be distinct from the current policy approach on some key dimensions. In particular, moving from an economy-wide approach to a disproportionate focus on internationally oriented sectors; from an agnostic sector-based

[12] *David Skilling & Danielle Boven, New Zealand Institute, 'The Flight of the Kiwi', July 2006 [available at https://nzinitiative.org.nz/reports-and-media/reports/the-flight-of-the-kiwi-going-global-from-the-end-of-the-world/] along with the other reports in the 'Creating a global New Zealand economy' series.*

approach to a focus on a limited number of high potential clusters; and from policy foundations to a focus on building competitive advantage through deep investment in skills, knowledge, and innovation.

The intensity of global competition, disruptive technological change, climate change, as well as the immediate and long-term effects of Covid-19 on the global economy, all create significant challenges ahead for small advanced economies. Strengthening New Zealand's productivity performance is imperative given likely reduced labour supply, a hard stop to tourism, structural challenges to red meat and dairy, and so on.

But the international small economy experience is also an optimistic one. Small advanced economies can produce frontier firms, which compete successfully in global markets, and leading levels of productivity performance. It is not the case that small economies need to accept more modest outcomes in terms of frontier firms because of their small domestic market size. There is no need for fatalism in New Zealand: it is possible to produce a meaningful number of frontier firms that are expanding into international markets from New Zealand.

About the author

Dr David Skilling is the founding Director of Landfall Strategy Group, which was established in 2011. David advises governments, companies, and financial institutions in several small countries, and writes regularly on global economic and political trends from a small country perspective. Previously, David was an Associate Principal with McKinsey & Company in Singapore, as well as being a Senior Fellow with the McKinsey Global Institute. Before joining McKinsey, David was the founding Chief Executive of the New Zealand Institute, a privately-funded, non-partisan think-tank. Until 2003, David was a Principal Advisor at the New Zealand Treasury. David has a Ph.D. in Public Policy, and a Master in Public Policy degree, from Harvard University, as well as a Master of Commerce degree in Economics from the University of Auckland. David was named as a Young Global Leader by the World Economic Forum in 2008.

About Landfall Strategy Group

Landfall Strategy Group is a research and advisory firm that provides advice on strategic economic and policy issues to governments, firms, and financial institutions, particularly in small advanced economies. We provide distinctive perspectives on emerging global trends, working with decision-makers to understand key global changes and how governments, firms, and institutions should respond and position themselves in the emerging global economic and political environment.

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Evidence pack: New Zealand industries

01/05/2020

Key statistics on the economic significance and performance of New Zealand industries prior to COVID-19

Significance

	Typical share of GDP (%, 2019)	Typical share of exports (%, 2019)	Employment share (%, 2019)	Number of firms (2018)	Proportion of workers Māori (%, 2019)	Proportion of workers Pacific (%, 2019)	Proportion of workers on temporary visas (%, 2019)
Food and Beverage Manufacturing	3.30	36.84	2.93	3,849	21	13	7.01
Wood Processing	0.90	3.30	1.04	1,809	25	7	2.91
Construction	6.80	0.03	9.96	70,900	16	6	7.06
Other Manufacturing	6.24	10.57	5.69	15,819	10	8	5.22
Hospitality	2.13	-	7.39	22,845	11	5	23.66
Digital Technologies	3.50	3.95	2.44	13,269	6	2	7.08
Tourism	5.80	20.01	8.40	-	15	15	-
Aerospace	0.72	0.27	0.22	-	-	-	-
Agritech	-	1.40	-	-	-	-	-
Retail	5.38	-	15.04	35,205	10	6	7.14
Energy and Resources	-	-	0.77	1,176	16	Suppressed	1.90
Creative Industries (excl digitech)	-	-	1.61	-	7	3	3.92
International Education	2.16	5.93	2.08	-	-	-	-
Primary Sector	5.70	12.00	5.69	65,300	14	3	19.08
Transport and logistics	5.00	-	4.99	16,266	16	9	4.31
Professional Services	-	-	13.68	60,543	7	4	4.13
Aged Care	-	-	1.55	840	-	-	21
Health Technologies	-	1.90	0.19	188	-	-	-

Performance

	Productivity indicators (2019)			Median weekly earning ($, 2019)	R&D expenditure ($m, 2019)	Emissions (t CO2-e, 2018)	Emissions intensity (t CO2-e per $m GDP, 2018)
	GDP/hr worked ($/hr)	1 year CAGR	10 year CAGR	All industries 1,012			
Food and Beverage Manufacturing	56.16	3.20	-0.40	999	145	2,907.34	0.38
Wood Processing	39.89	0.10	1.60	1,055	36	550.30	0.26
Construction	32.43	-2.60	0.90	1,150	16	494.96	0.03
Other Manufacturing	51.78	-	-	1,112	483	5,420.09	0.38
Hospitality	22.45	-3.30	0.50	620	8	-	-
Digital Technologies	-	-	-	1,550	873	-	-
Tourism	-	-	-	-	61	-	-
Aerospace	-	-	-	-	-	-	-
Agritech	-	-	-	-	-	-	-
Retail	19.72	3.30	3.10	847	184	-	-
Energy and Resources	-	-	-	1,630	104	6,384.26	-
Creative Industries (excl digitech)	-	-	-	1,055	6	-	-
International Education	-	-	-	-	-	-	-
Primary Sector	47.00	5.90	1.30	959	53	15,634.17	1.19
Transport and logistics	47.01	-2.40	1.30	1,040	9	16,590.04	1.43
Professional Services	-	-	-	1,247	1,132	-	-
Aged Care	-	-	-	-	-	-	-
Health Technologies	-	-	-	-	266	-	-

Key		
Low	Medium	High

Note

1. **Key applied by comparing industries shown**
2. Primary sector emissions appear low as they contain land use change and forestry which is a net carbon sink
3. Digital technologies GDP and export figures are from 2018
4. Aerospace data is for the space sector only, which is a subsector of the broader aerospace sector. Data is from MBIE commissioned space reports published in 2019
5. International Education GDP, export, and employment figures are from an Education NZ report published in 2018
6. Aged care migrant worker data is from the NZ Aged Care Association
7. Temporary visas equal total visas excluding NZ citizens, permanent residents and residents
8. Any number under 1,000 has been 'Suppressed'
9. A full list of references is included at the back of the evidence pack

NOTE: QUALITY ASSURANCE HAS NOT BEEN COMPLETED ON THESE TABLES

Key statistics on the economic significance and performance of New Zealand industries prior to COVID-19

Employment by region and industry, 2019

	Northland	Auckland	Waikato	Bay of Plenty	Gisborne / Hawke's Bay	Taranaki	Manawatu-Wanganui	Wellington	Nelson / Tasman / Marlborough / West Coast	Canterbury	Otago	Southland
Food and Beverage Manufacturing	1,700	15,800	6,200	2,800	5,800	4,100	4,300	3,800	4,100	12,100	3,900	2,300
Wood Processing	1,000	5,200	4,000	2,600	1,800	Suppressed	1,300	1,300	1,300	2,700	1,400	Suppressed
Construction	6,300	80,100	21,000	15,900	9,100	7,000	6,500	20,200	7,600	37,100	13,500	3,500
Other Manufacturing	3,600	54,000	12,600	7,200	5,200	2,600	5,600	8,900	4,800	17,300	5,300	2,800
Hospitality	5,400	49,800	11,200	6,600	4,000	4,000	5,900	13,700	6,100	20,100	10,200	2,400
Digital Technologies	Suppressed	29,800	2,600	1,500	Suppressed	Suppressed	1,300	11,700	Suppressed	6,100	Suppressed	Suppressed
Retail	9,400	141,800	30,300	18,600	12,500	7,000	16,000	28,800	13,600	42,200	17,000	6,500
Energy and Resources	2,000	2,800	2,500	Suppressed	Suppressed	1,900	Suppressed	1,700	Suppressed	3,000	1,100	Suppressed
Creative Industries excl. Digitech	Suppressed	17,000	1,900	1,200	Suppressed	Suppressed	Suppressed	7,200	Suppressed	4,100	2,300	Suppressed
Primary Sector	10,000	5,800	20,900	11,200	11,600	7,600	12,000	4,800	11,300	15,600	7,500	11,800
Agriculture*	8,400	4,800	19,400	10,400	9,800	7,100	11,300	4,400	8,200	15,400	7,200	11,000
Dairy*	3,000	1,300	13,900	3,300	Suppressed	6,700	4,500	1,600	Suppressed	5,000	4,100	7,200
Transport and Logistics	2,200	49,600	8,400	6,000	3,100	2,600	3,400	11,900	3,400	14,800	5,300	3,300
Professional Services	6,600	138,900	27,100	18,100	9,000	4,500	8,600	45,100	8,700	32,500	8,500	4,900

Key		
Low	Medium	High

Note
1. Key applied by comparing industry employment for each region, highlighting which sectors are the largest employers in each region
2. Any number under 1,000 has been 'Suppressed'
3. **Dairy and Agriculture are both subsectors of the Primary Sector. There are overlaps with how these two subsectors are defined
4. A full list of references is included at the back of the evidence pack

OOD AND BEVERAGE

24/04/2020

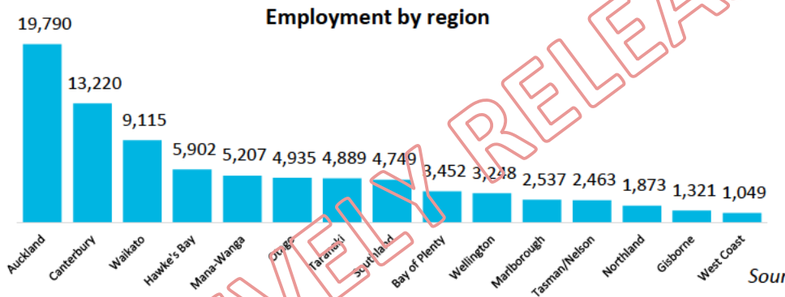
industry profile

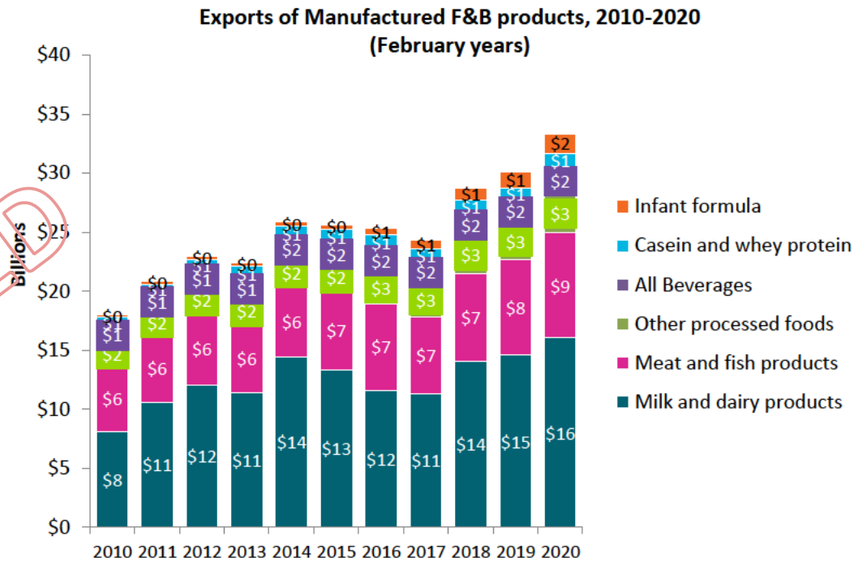
Significance

- The **food and beverage industry represents 32% of New Zealand's manufacturing sector, and produces 3.3% of GDP**.
- New Zealand has six strong food and beverage sectors: meat; dairy; produce; processed foods; seafood; and beverages. There are significant growth opportunities in all six. New Zealand has relatively little land in horticulture compared to international peers and could easily double or triple land in vegetables and fruit (kiwifruit, apples, berries).
- Manufactured foods and beverage exports were $31.6 billion in 2020 (37% total exports)
- **96,000 workers employed in food and beverage manufacturing. 19,000 (21%) of these are employed in Auckland, including a large percentage of Pacific People**. The full value chain (primary production, processing and manufacturing, wholesaling and retailing) employs one in five New Zealand workers.
- **There are 3,800 firms, of which 129 employ more than 100 people, accounting for 73% of food and beverage employment (70,200 workers).** There are an increasing number of start-ups and small firms.
- The industry has a high capital stock per worker compared to the average in the economy. In the five years 2014 to 2018, a total of $7.9b was invested in capital stock, the majority of this is directed at added-value food production, e.g. infant formula, UHT milk, and a growing range of processed foods and beverages.
- The top 200 food and beverage firms in New Zealand had combined revenue of $71.7b in 2018/19. This includes some firms that are primarily marketers, such as Zespri and A2.
- **In the last two decades the number of food processing firms has increased by 50% and more than 13,500 jobs have been created** - from the factory floor to a wide variety of roles such as marketing, sales, branding, package design, and new product development. This growth is occurring across all regions and most sectors.

Performance

- Productivity has marginally declined overall in the ten years to 2018, but grew by 3.6% in the 2018 year.
- **60% of firms engaged in innovation in the last two years, the third highest rate of any sector after wholesale trade and media and telecommunications**.
- 19% of firms engaged in R&D activity in the last two years accounting for 3.8% of all business expenditure on R&D (BERD) and 12% of manufacturing BERD.
- Exports of manufactured foods and beverages grew by $13.8b from $17.7b in 2010 to $31.6 in 2020 (February years); a compound annual growth rate (CAGR) of 10.3%. Growth has occurred across all major categories, with added value standouts being infant formula (+$1.4b); "other processed foods" (+$1.2b); and beverages (+$1b).





Note: Excludes non-F&B manufactured exports, e.g. kiwifruit, apples.

Source of charts: StatsNZ

Contribution to GDP (%, 2019)	Number of firms, 2019	Number employed, 2019	Proportion of workers Māori (%)	Proportion of workers Pacific (%)	Exports ($b, 2020)	Mean weekly earnings ($, 2019)	R&D expenditure per firm ($m, 2019)	Gross greenhouse gas emissions, 2018	Current work visas, 2019
3.3	3,800	96,000	21	13	$31.6 (37% NZ)	1,132	145	2907.341	5,274

Impacts of COVID-19

Current state

- **The industry is an essential service so largely operated throughout Alert Levels 3 and 4**. Key parts of the industry were only operating at 50% capacity because of need for social distancing e.g. meat industry, causing possible animal welfare issues on-farm, particularly considering drought in Auckland and Coromandel.
- **There have been issues with supply of labour to pick crops, partially off-set by re-purposing labour from other industries**.
- Many smaller local firms are seeing increased demand for their product as consumers switch to buying local.
- The lockdown has driven enthusiasm for cooperation and innovations. For example a group set up by the NZ Institute of Food Science and Technology, the "Foodie Volunteer Army", is providing a critical forum for food scientists and technologists to collaborate in the lockdown environment, enabling food businesses to get support from supply chain issues and ingredient substitution to personnel management with 2m social distancing.

Future outlook

Food and beverage manufacturing will likely be a major engine of recovery in regions and urban centres, and in growth of exports, including of premium goods. This is an opportunity to significantly diversify and grow New Zealand's food and beverage export portfolio, with scope to replace imports of food and ingredients with local product. In addition:

- **Most regions have an opportunity to increase value-add production**, and there are existing plans for necessary support measures that can be fast-tracked. (E.g. FoodHQ have provided a short revised proposal focused on regional support for food & beverage firms, rapid training and upskilling. ATEED is developing a recovery plan for the sector given its prominence in Auckland, particularly South Auckland.)
- **The international demand for safe and nutritious food is likely to at least remain stable, and we could see a significant increase in demand in the longer term**. Furthermore New Zealand can leverage its global reputation for quality, safe and authentic production for premium pricing in markets.
- **However, there is likely to be volatility in commodity exports (whole milk powder) and some pressure on premium exports**, such as wine to US and UK markets as consumers reduce spending. Products for food service markets (hotels, restaurants, take-out) such as fresh cheese (mozzarella); venison; and lobster may see reduced demand.
- Analysis carried out by Coriolis research indicates that New Zealand could add between 10,000 and 30,000 jobs in food processing based on comparison with similar developed food exporting countries and with no increase in raw materials (that is, on-farm production).

Description Food and beverage manufacturing includes meat and meat products, seafood processing, dairy products, fruit and vegetable processing, oils and fats, grain mill and cereal products, bakery products, sugar and confectionery, other food manufacturing (including pet food) and beverage manufacturing including both alcoholic and non-alcoholic beverages.

Key Take Outs

- Food and beverage is a significant industry to New Zealand, contributing 3.3% to GDP and 37% to total exports.
- The industry is an essential service so largely operated throughout Alert Levels 3 and 4, with disruptions to potential output due to social distancing measures.
- Food and beverage will be a major engine of New Zealand's economic recovery. There is an opportunity to diversify and grow our export portfolio, with scope to replace imports of food and ingredients with local product.

WOOD PROCESSING

24/04/2020

Industry profile

Significance

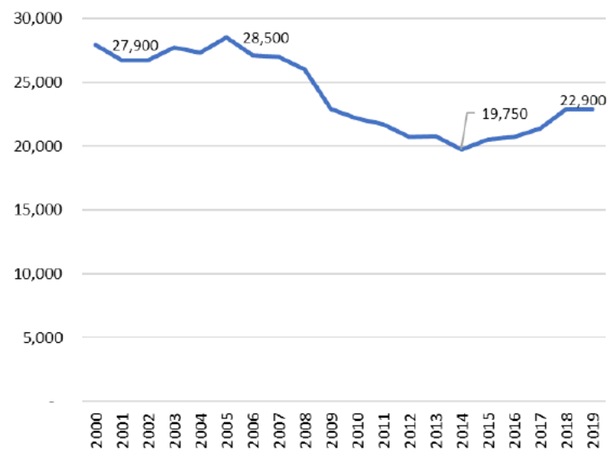
- **Wood processing comprises 9% of New Zealand's manufacturing industries and 0.9% of GDP (real)**
- **Exports of processed wood products (e.g. sawn timber, fibre board) and pulp and paper were valued at $2.8 billion in 2020**, up from $2.5b in 2010 (February years), a ten-year compound annual growth rate (CAGR) of 1% (+$289m).
- 24,400 workers are employed in wood and paper.
- **There are 1.800 firms, of which 33 employ more than 100 people, accounting for 50% of all employment in the sector (12,000)**
- Large number (366) of medium sized firms (employing between 10 and 99 workers).
- **Total firm numbers have decreased from 2,313 to 1,809 in the period 2008 to 2018, while large firms (100+) have increased from 27 to 33, indicating some consolidation taking place in the industry.**
- There is a high capital stock per worker, 22% above the average in the economy
- In the five years 2014 to 2018, a total of $1.1 billion was invested in capital stock. Investment in fixed capital has been declining over the last ten years.

Exports of wood, pulp and paper products, 2010—2020 (February years)

Performance

- **Productivity grew at an average of 1.6% in the ten years to 2018**.
- **48% of firms engaged in innovation in the last 2 years**, just below the New Zealand average of 49%, the lowest of the manufacturing sectors.
- **10% of firms engaged in R&D in the last two years, the lowest of the manufacturing sectors**.

Wood, pulp and paper employement 2000-2019



Contribution to GDP (%, 2019)	Number of firms, 2019	Number employed, 2019	Proportion of workers Māori (%)	Proportion of workers Pacific people (%)	Exports ($b, 2020)	Average weekly earnings ($, 2019)	R&D expenditure ($m, 2019)	Gross greenhouse gas emissions, 2018	Temporary visas (%)
0.9	1,800	24,400	25	7	$2.8 (3.3% NZ)	1,055	36	550.30	2.91%

Impacts of COVID-19

Current state

- **Wood processing industries were not able to operate under Alert Level 4** (not deemed an essential service), but reopened under Level 3.
- Long-standing issues in the industry may come to a head in the current environment. These include:
- **Distortions in the global trade for logs and timber**, as many countries protect or subsidise their industries.
- **A preference by China to buy New Zealand logs which increases the cost of logs for New Zealand processors**.
- The fact that most New Zealand plantation forests are **privately owned** (the trees, if not always the land) and that the incentive for forest owners is to sell to at the highest price;
- The fact that few New Zealand processors also own forests, so there are **few vertically integrated operations**.
- The **New Zealand industry is generally small scale** compared to industries in other countries; even the pulp and paper mills in Kawerau, with Red Stag timber being an exception.
- Many of **New Zealand's smaller sawmills are getting to the end of their economic life** and either need significant re-investment with the latest technology and plant, or will close. As a general comment **global competitiveness will require fewer scale operations, integrated development** (e.g. sawmills produce sawdust which is used for pulp and paper).
- The industry historically has been fragmented with a number of industry bodies.

Future outlook

- In the short term, **Chinese demand is recovering, and the export of New Zealand logs will generate both employment and export dollars**.
- In the longer term **significant re-investment is needed to support productive growth**, e.g. in highly automated plants. This will add value to logs, but will not generate significant direct additional employment.
- **Scale operations are critical to competitiveness**. The Government can play an important role in investing in research to identify viable technologies, commercial opportunities and export markets, which can form a basis of information enabling private investment.
- To support the focus of the Wood Processing ITP, Te Uru Rākau with support from MBIE has commissioned research into future opportunities for wood processing in New Zealand with a strong emphasis on commercial opportunities for a range of bio-economy products (bio-plastics, bio-fuels, chemicals). Once this research is completed, it may be followed up by a comprehensive feasibility study, which would form the basis for investment attraction and will identify areas where there might need to be Government intervention, e.g. infrastructure.
- Te Uru Rākau is also undertaking a Forestry Strategy to be completed this year.
- Industry leaders have signalled areas of focus for the ITP, including more use of wood in building and construction, accelerated depreciation, and assistance in developing standards.

Description Wood includes log sawmilling and timber dressing, the manufacture of engineered wood products such as plywood, laminated veneer lumber (LVL), medium density fibreboard (MDF), prefabricated wooden buildings, cabinetry or wood chips. Paper includes pulp, paper and card manufacturing and products made from these such as boxes, paper bags, toilet tissue and other packaging.

Example firms

Wood: Tenon; Nelson Pine; Juken New Zealand; Red Stag Timber; XLam.

Paper: Kinleith Pulp and Paper Mill (Oji Fibre Solutions); Tasman pulp and paper mill (pulp mill owned by Oji Fibre Solutions, paper mill owned by Norske Skog Tasman).

Key Take Outs

- Wood processing is a key industry for New Zealand.
- Wood processing did not operate under Alert Level 4 but activities resumed under Level 3. Long standing issues with the industry may come to a head in the current environment.
- In the short term, Chinese demand is recovering, and the export of New Zealand logs will help with our recovery. However in the longer term, significant reinvestment is needed to support productive growth.

CONSTRUCTION

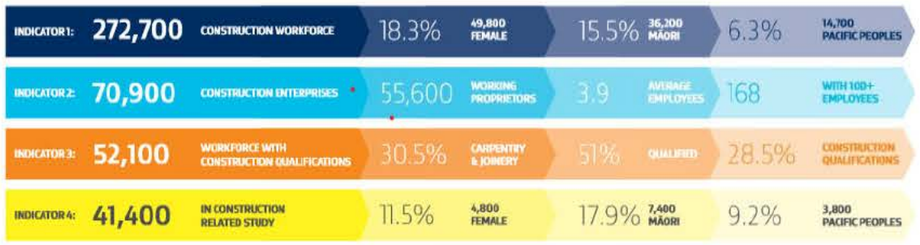
24/04/2020

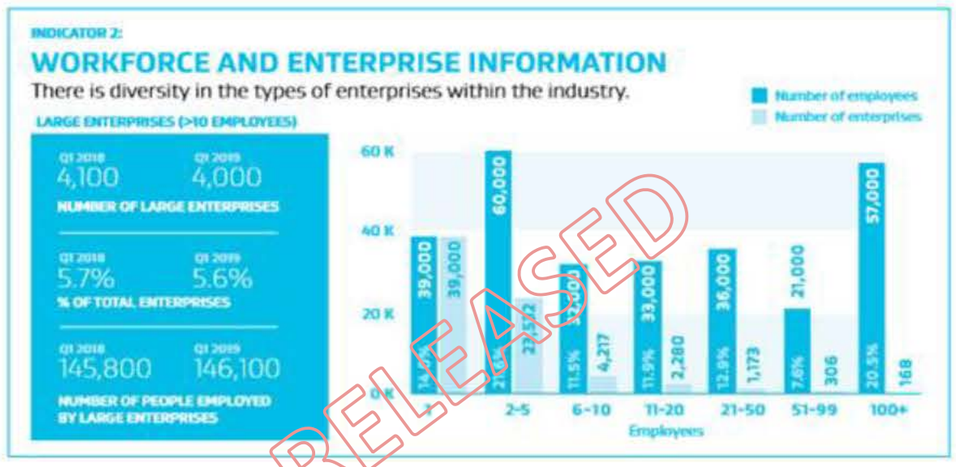
Industry profile

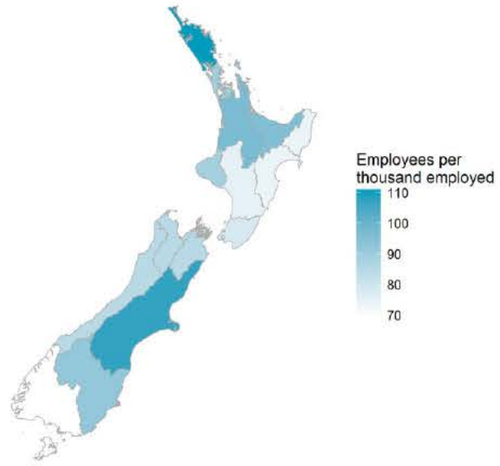
Significance and performance

Construction is a major driver of growth and is the fourth largest sector in the New Zealand economy.

- It **directly employs over 272,700 people in construction-related occupations.** This includes those in professional, scientific and technical services (i.e., architectural services, engineering design and engineering consulting services) and manufacturing (i.e. prefabricated metal and building manufacturing).
- In 2019, construction generated 6.8% of GDP (real).
- The sector is ethnically diverse. **15.5% of total construction employees are Māori and 6.3% are Pacific People**
- The proportion of women working in the construction sector is 18.3%, increasing by 0.4 percentage points since 2012.
- **Immigration plays an important role in the construction workforce.** Of the 272,700 employed, approximately 6.4% were on a working visa, up from 1.2% at the end of 2012.







Contribution to GDP (%)	Number of firms	Number employed	Proportion of workers Maori (%)	Proportion of workers Pacific people (%)	Annual labour productivity growth	Average labour productivity growth 2008-2019	Average hourly earnings ($)	R&D spend as a % of industry GDP	Gross emissions (t CO2-e)
6.8%	70,900	272,700	15.5%	6.3 %	2.6%	1.1%	$30.52	0.09%	9%

Impacts of COVID-19

Current state

The Alert Level 4 lockdown allowed only for work on essential or critical infrastructure or that addressed immediate health or life safety risks.

The March ANZ Business Outlook Survey reports:

- **67.6% of construction sector businesses expect worse times ahead**, from neutral in February.
- Commercial construction intentions fell 43 points to a net – 22% expecting not to increase construction (down from 26% who had been expecting an increase in the February survey); residential fell from +23 to -21.

The construction sector will have an important role to play in kick-starting the New Zealand economy.

- The Construction Sector Accord (collaboration between construction sector leaders from across government and industry) has temporarily shifted focus from industry transformation to resilience and recovery. The Accord Steering Group has a response plan largely focused on government actions with an expectation that the private sector will act likewise where possible. Actions are focused on:
  - Maintaining and accelerating the pipeline of work and removing barriers to restarting works
  - Keeping cash flowing in the sector
  - Ensuring a fair and consistent approach to how contractor costs are covered and/or reimbursed during the shutdown
  - Additional financial and other support for employees and business owners
  - New health and safety guidelines to ensure the safe return to work.

Future outlook

Infrastructure Reference Group process will help drive a pipeline of fast-tracked construction activity.
Phase two (Restart) of the **Construction Sector Accord** plan proposes:

- Maintaining the pipeline of construction projects
- Positioning 'shovel ready' projects across urban centres and the regions to begin works, and facilitate their acceleration
- Developing a strategy to support the distribution of work across the civil, vertical and residential construction subsectors, as well as across the supply chain and the regions
- Providing stimulation for the residential market including through Kāinga Ora
- Considering further medium and long-term stimulus measures to help the sector move to long term resilience
- Maintaining cashflow in the sector
- Rapidly mobilising multi-party collaborative projects through ensuring procurement strategies and commercial frameworks are developed and ready to go (e.g. the Stronger Christchurch Infrastructure Rebuild Team)

- In lockdown, the **sector has seen supply chain disruption** (e.g., containers not being shipped as ports are closed; delays in getting construction materials from China (RNZ, 2020; Stuff, 2020)).
- The **number of building consents (residential and commercial) may drop.** During times of economic downturn, building consent numbers have been negatively impacted, e.g. during the Global Financial Crisis (GFC) in 2008-2009.
- **Projects being postponed or shelved is likely across the board** – commercial, industrial retail and residential developments. Universities, airports, and tourism (hotels) are heavily impacted with some projects already put on hold. The likely impact on infrastructure projects will flow on to housing supply and community infrastructure.
- **The impact on employment is unknown at present because of retrenchment.** There may be a short-term exacerbation of skilled staff shortages which were already being experienced within the sector pre-COVID-19. Restrictions on immigration may also contribute.

Key Take Outs

- There are a large number of firms within the construction sector supported by a wider grouping of ancillary services.
- Large number of workers employed within the sector with a high proportion of Māori and Pacific Peoples employed.
- Retrenchment within the sector likely to have a significant flow on effect throughout the NZ economy, but "shovel-ready" projects will help.

THER MANUFACTURING (excluding food & beverage and wood processing)

24/04/2020

Industry profile

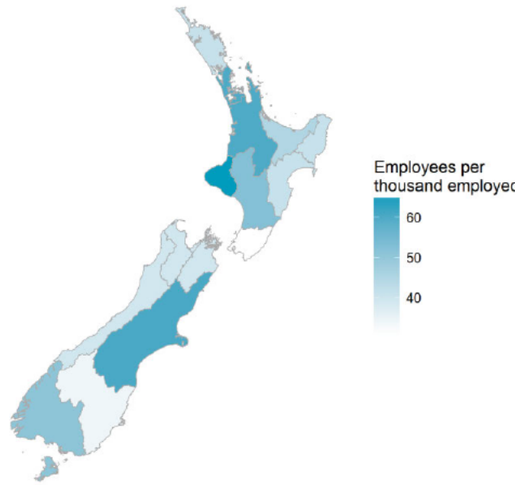
Description: 'Other manufacturing' includes the subsectors of chemicals and refining, machinery and equipment, metals, plastics and rubber. It excludes food and beverage and wood processing manufacturing

Significance

- **Other manufacturing is a significant contributor to the New Zealand economy, employing 130,000 New Zealanders and adding over 6% of GDP ($14,389m**).
- Although many of the largest manufacturing firms are in food and beverage manufacturing (discussed separately), other manufacturing **includes a number of large and important firms**, such as NZ Steel, Douglas Pharmaceuticals, Fisher & Paykel and Wyma Solutions (producing pack-house equipment for the produce industry).
- **Employment is largely concentrated in the main centres**, however, the heatmap opposite shows that other manufacturing employment makes up a high proportion of regional employment, particularly in Taranaki.
- **Māori and Pacific peoples are strongly represented in manufacturing**. 10% of workers in the manufacturing sector are Māori and 8% are Pacific peoples.
- Other manufacturing also contributes significantly to New Zealand's exports, generating $9.087 billion in 2019.
- Key parts of other manufacturing **supply a wide range of products for construction**, outside of timber products. Investment in infrastructure and housing will also drive growth in manufacturing.

Performance

- The manufacturing sector has **historically low labour productivity growth**. Other manufacturing subsectors have a range of 10 year labour productivity compound annual growth rates (CAGR): Chemicals and refining 2.6%; Plastics and rubber 2.6%; Machinery and equipment 0.9%; Other manufacturing 0.3%; Metals -1.1%.
- Emissions for the sector are over 5,000 kilotonne CO_2 equivalents, about half those of the energy and resources sector but over 10 times more than the construction sector.
- The sector **invested $480 million in R&D in 2018, but significant potential lies in the area of advanced manufacturing** – Industry 4.0 – as discussed in Future Outlook below.
- **The sector is facing several skills shortages**, with a lack of tradespeople and technicians a key issues, along with a lack of digital capability.
- The **sector takes a significant time to recover following shocks**. Manufacturing was one of the worst impacted by the GFC, with large decreases to output, productivity, firm numbers and employment, and the sector didn't return to growth until 5-6 years after the GFC.



Contribution to GDP (%, 2019)	Number of firms (2018)	Number employed (2019)	Employment share (%)	Proportion of workers Māori (%)	Proportion of workers Pacific People (%)	Export share (%, 2019)	GDP/ hrs paid ($/hr)	Annual labour productivity growth (10yr CAGR %)	Current work visas (2019)	Average hourly earnings ($)	R&D spend as a % of industry GDP	Gross emissions (t CO2-e)	Emissions intensity (t CO2-e per $m GDP
6.24	15,819	130,000	5.69	10	8	10.57	51.78	Between -1.1 – 2.6	5973	31.65	3.4%	5420.09	0.38

Impacts of COVID-19

Current state

- Overall the manufacturing sector is facing **significantly negative economic impacts, with large disruptions to their operations**. However there are exceptions, with manufacturers operating in the health sector, such as Fisher and Paykel Healthcare, enjoying strong demand for their products and performing well.
- The mandated shutdown in New Zealand has **prevented manufacturers from fulfilling international orders and obligations, putting at risk important export contracts and long-term relationship**s.
- **The disruption of trade and logistics, including air freight and overseas lockdowns, has restricted the flow of key inputs into NZ manufacturing operations**, meaning firms must find alternative supply, often at increased cost, or potentially restrict or cease production. It has also limited the ability of NZ manufacturers to ship their products to customers.
- Callaghan Innovation's manufacturing customers were among the most pessimistic, with only 49% seeing opportunities, compared with 58% of all of Callaghan Innovation's customers.
- 51% of Callaghan Innovation's manufacturing customers are reporting they are focussing on existing business due to the unclear future. Given that Callaghan customers will be those most innovative manufacturers, this indicates significant hesitancy for the sector as a whole.
- Of NZTE's F700 manufacturing companies (including food and beverage and wood processing), 30% are classed as essential services and continuing to operate, while 26% are closed, 23% have reduced activities and 18% are working from home.

Future outlook

- COVID-19 and the resulting global recession will have significantly negative impacts on New Zealand's manufacturing sector. **Many New Zealand manufacturers are part of complex global supply chains that are currently being dramatically disrupted by shutdowns around the globe.** As shutdowns lift, the impacts will be less severe, **but lengthy border closures and restricted air travel and freight will continue to hamper existing commercial relationships and make the development of new international business opportunities very difficult**.
- **The fragilities of international supply chains have been exposed by this crisis**, with many manufacturers and countries recognising the value of reliable local supply links. This may mean more **focus within New Zealand on domestic manufacturing instead of imports**, but other countries will likely become more insular, putting our exporting firms at risk.
- The financial impacts of the shutdown and recession, and the added time demands needed to continue operations will reduce the ability of New Zealand manufacturers to make much needed investments in technological developments such as Industry 4.0 that will be vital for ensuring ongoing international competitiveness of the sector. 45% of Callaghan Innovation manufacturing customers are looking to increase R&D in the long run, while 32% are looking to decrease. Given this captures the most innovative firms in the sector, the sector as a whole is unlikely to be investing strongly in R&D. Firms are likely to require incentives tailored to encourage the adoption of Industry 4.0
- **The impacts will also reduce the ability and appetite for manufacturers to invest in upskilling of workers and taking on apprentices**. This is essential for the future labour supply of the sector, but is often is not considered essential by individual firms when the focus is on survival. A skills shift towards softer skills and digital skills is occurring, but manufacturers need to adjust more to lifelong learning approaches, and proactive upskilling.
- Prior to COVID-19 **manufacturers were facing significant skills shortages and were almost entirely reliant on skilled migrants for certain specialised skills**. Border closures will greatly exacerbate this issue and may drive hyper competition for those skilled individuals already within New Zealand. It may also prevent expansion or upgrading of operations if sufficient skilled staff cannot be obtained. The scale of this issue will depend on NZ border policy, but also the ease of travel and willingness to travel in a post COVID-19 environment.

Key Take Outs

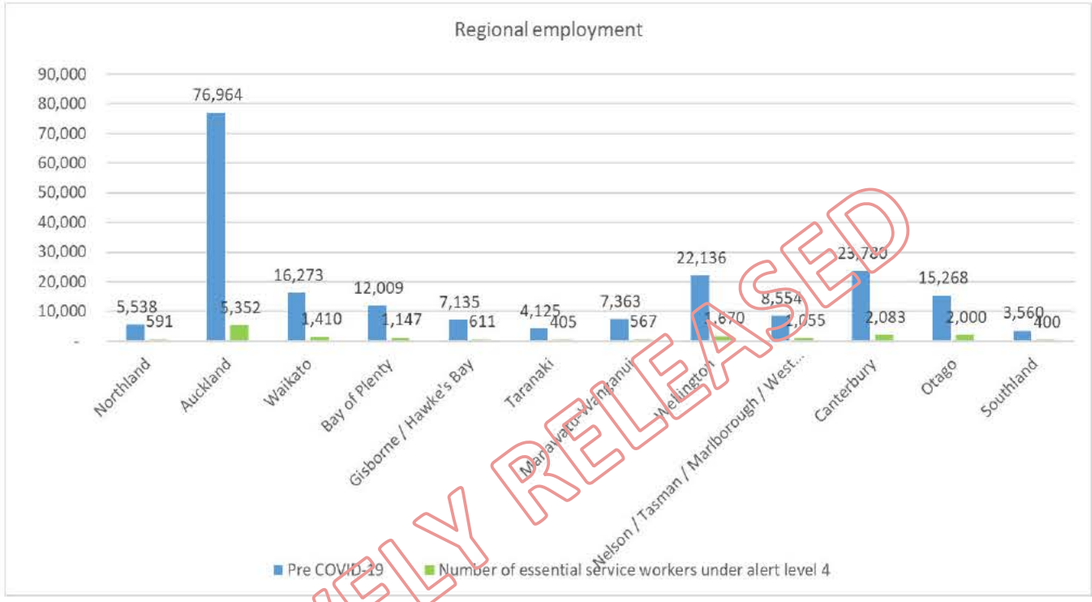
- Other manufacturing is an important employer and exporter for NZ, employing 5.8% of workers and contributing 10.6% of exports
- The industry has been disrupted, particularly due to interconnection with global supply chains.
- Other manufacturing can be a key driver for recovery, and employment, but will require support to address long-term skills shortages and technology investment.

HOSPITALITY

24/04/2020

Industry profile

Description The hospitality industry encompasses accommodation (e.g hotels) and food services, including cafes and restaurants, takeaway food services, catering services and bars and clubs.



Significance and performance

- **The hospitality sector contributes 2.13% to GDP and employs 7% of the workforce. It is domestically focused but is strongly linked to the tourism sector**. The restaurant and cafe sector recorded the highest growth of 5.1% in 2019.
- **The hospitality sector is a significant employer in Auckland, but also makes up a large proportion of employment in the South Island**, particularly on the West Coast. There are high concentrations of hospitality employment in Queenstown, Kaikoura/Westland, and Rotorua.[4]
- Employment figures show that Auckland, Wellington and Manawatu-Wanganui have the lowest proportion of essential service workers in employment relative to the pre-COVID employment figures.
- **Māori are strongly represented in the hospitality sector, representing 11% of the workforce.** Pacific people make up 5% of employees.
- **Around 60% of hospitality employees are female**. Hospitality also has the youngest workforce, with 39% of employees under 24 years, and 5% under 29 years.[5]
- In 2018 15% of industry/service sector energy use was by the accommodation and food services sector
- **The sector has large numbers of casual workers**. In 2018, Statistics NZ found that 27% of employers in the accommodation and food services industry needed to be available for non-guaranteed work.[4]

Contribution to GDP (%)[1]	Number of firms	Number employed	Employment share (%)	Proportion of workers Māori (%)	Proportion of workers Pacific People (%)	Annual labour productivity growth	Average labour productivity growth 2008-2019	Average hourly earnings 2019 ($)
2.13%	22,845	168,800	7%	11%	5%	-3.30%	0.50%	$22.35

Impacts of COVID-19

Current state

The accommodation and food services sectors and tourism were significantly impacted by the Alert Level 4 lockdown and the effective closure of New Zealand's borders to tourists.

- **Accommodation provision was heavily impacted by the lack of domestic and international visitors**. Some businesses provided quarantine facilities for returning travellers but this represented only a limited number of providers.
- Food service was also heavily impacted with most businesses closed to the public. **Hospitality NZ reported high vulnerability amongst restaurants/cafes/bars expected to worsen the longer the Alert Level 4 and 3 restrictions remained in place**. A Restaurant Association survey indicated 20 percent of the 400 businesses surveyed expected to close permanently as a result of the lockdown.

Future outlook

The hospitality sector is likely to **remain heavily impacted by the social distancing restrictions, restrictions on domestic travel, and border closures**. The longer these measures are in place, the worse the damage to this sector is likely to be.

- A Horizon poll from 7-12 April 2020 suggests that there will be a **rebound in demand for hospitality after restrictions are lifted (based on reported intentions).** The survey finds that 51% of Kiwis intend using a café in the six months after restrictions are lifted, and that domestic travel would receive a boost that would increase demand in the hospitality sector through increased demand for cafes, bars and restaurants as well as accommodation services.
- However, any rebound in domestic demand would be **constrained by the ongoing economic damage from the COVID-19 response** (for example higher unemployment rates, small businesses going under, and the lack of international visitors).
- Displaced workers from the hospitality sector could potentially be retrained for other industries.

Key Take Outs

- The hospitality sector has been very badly hit by the lockdown restrictions, domestic travel restrictions and border closures.
- The hospitality sector was a large employer in New Zealand
- Survey evidence suggests domestic demand will return once restrictions are lifted. However, activity is unlikely to rebound to pre-COVID levels for quite some time.

IGITAL TECHNOLOGIES

24/04/2020

profile

Significance

- New Zealand's digital technologies sector has been growing steadily over the last decade, becoming increasingly important to the economy as a high-value sector and underpinning productivity improvements in other sectors across the economy.
- In 2018, the digital technologies sector contributed almost $7 billion, or 3.5% of GDP.
- There were 13,269 firms in the sector in 2019, up from 10,035 firms in 2009. Larger firms include Xero, Datacom and Pushpay.
- Over 75% of these firms had no employees, illustrating a significant proportion of self-employed workers in the sector.
- Māori and Pacific workers are particularly underrepresented in the sector, with roughly 6% of employees being Māori. Pacific people comprise roughly 2% of the STEM workforce in New Zealand.
- Exports in the sector topped $3 billion in 2018, with key markets being Australia, the USA and Europe.
- Employment in the sector is concentrated within the major centres (see Figure 1), but regional activity is growing, taking advantage of broadband infrastructure.

Performance

- Pre-COVID-19 the New Zealand digital technologies sector recorded strong revenue growth levels particularly within Software solutions (20.3% revenue growth) and Fintech (33.2% revenue growth).[1]
- Average wages in the sector are significantly higher than the NZ average. In 2018 the average salary was $115,000 compared to the NZ average of $58,000.
- Digital technology firms are more likely to invest in R&D than the NZ average and R&D expenditure per firm is higher. The average expenditure per digital technology firm was $2.5 million in 2018.
- Digital technology firms report having more hard-to-fill vacancies than the NZ average, and rely on skilled migrants to fill some of these shortages.
- Work on the digital technologies ITP to date has identified some issues for the sector, including a lack of a strong NZ tech brand, skills shortages, lack of diversity and the need to be more proactive about seizing opportunities from emerging technologies such as Artificial Intelligence.

[1]TIN, The Investor's Guide to the New Zealand Technology Sector, 2019.

Figure 1: Digital technology employment by region

Contribution to GDP (%, 2018)	Number of firms	Number employed	Proportion of workers Māori (%)	Proportion of women in industry (%)	Exports ($, 2018)	Average salary ($, 2018)	Average R&D expenditure per firm ($, 2018)	Union membership (%)	Work visas approved (2018/19)
3.5	13,269	76,065	6	23	3.4 billion	115,189	2.5 million	2	4,628

Impacts of COVID-19

Current state

- Current indications point to an overall decline in all but a few digital technology markets, primarily due to decline in customer base in other sectors.
- NZTech has been collating responses from a member survey carried out during the lockdown period.[2] The responses indicate a decline in operations across the board.
- Impacts recorded include:
  - 15% of firms have already had to let staff go, with 18% expecting to have to let staff go in the future as a result of responses to COVID-19.
  - 42% have been impacted by their reliance on external suppliers or manufacturers.
  - 68% of all companies cited access to customers as the biggest risk to current business activity. For start-ups, 85% of firms cited access to funding as the biggest risk to business activity.
  - 30% of firms have taken advantage of the Government's Economic Response Package.
  - Cashflow, loss of funding and clients stopping projects are cited as major issues.
  - Customers offshore cannot be contacted because they are also in lockdown.
  - Major IT transformation projects have stopped and contracts have been cancelled.
  - Customers have indicated they are stopping undertaking capex investments which will have a flow-on effect for tech projects.
  - Business decisions are either slow or on hold (e.g. A bank customer not renewing contracts until more clarity in market).

[2]Note the survey size is 249.

Future outlook

- Table 1 outlines the likely COVID-19 impacts on the sector, as identified in the IDC report *The impact of COVID 19 on the New Zealand ICT Market,* April 2020. These impacts will occur in the immediate short-term.

Table 1: Likely impacts of COVID-19 on the New Zealand ICT market

Market	Likely COVID-19 impact	IDC opinion
Applications	Neutral	Impacted but demand for collaboration tools will see an increase.
Application development & deployment	Negative	Deployment and custom development of software will be most impacted; large development projects are put on hold or cancelled.
System infrastructure	Negative	Will be impacted in the short term as onsite consultants/contractors are needed.
Software as a Service	Positive	Demand for cloud software has significantly increased.
Managed services	Negative	Customers under financial constraints with contracts coming up for renewal in 2020 will likely undertake reviews and exit clauses triggered in order to drive down costs.
Project Oriented	Highly negative	Likely to be impacted hard as non-essential projects are put on hold.
Support services	Negative	Supply chain constraints will put pressure on the hardware deploy and support market, but this will be tempered by a shift towards online education and training.
Cloud	Positive	Organisations will increasingly turn to IaaS to help ensure business continuity.

Key take outs

- While impacted in the short term by the decline in customer base, digital technologies' dual roles as a growth industry in itself, and as an enabler for other sectors, will be even more important in the COVID recovery phase.
- Significant potential exists around capabilities like cloud computing, remote working and learning, e-commerce, and export of digital services.

OURISM

24/04/2020

industry profile

Significance and performance

Tourism is a large part of the New Zealand economy, employing 229,566 people directly (8.4% of the workforce) and 163,713 people indirectly (6.0%). Tourism generates 5.8%of direct value added to GDP. Tourism contributes more to total employment than it does to direct value added, reflecting its a higher level of labour intensity

In the year to March 2019:

- Total tourism expenditure was $40.9 billion, an increase of 4.0% ($1.6 billion) from the previous year.
- International tourism expenditure increased 5.2% ($843 million) to $17.2 billion, and contributed 20.4% to New Zealand's total exports of goods and services.
- Domestic tourism expenditure increased 3.3% ($746 million) to $23.7 billion, accounting for 58% of tourism expenditure.
- Tourists generated $3.8 billion in goods and services tax (GST) revenue, with $1.8 billion coming from international tourists.
- Overseas visitor arrivals to New Zealand increased 1.3% to 43,797.

- **Māori have a strong presence in the tourism sector**. NZ Māori Tourism data shows Māori represent at least 3,423 self-employed and 67,038 employees are involved in the sector, this is a large proportion of the working age population of Māori who may be impacted by significant job loss in the sector (age 15-64 pop. 455,300). This will increase economic disparity in New Zealand.
- **Some Iwi are significant owners of key tourist assets** (for example Ngai Tahu Tourism are putting its 14 major holdings (eg Shotover Jet) into hibernation and considering large-scale redundancies. In addition, Iwi balance sheets may be particularly affected where Iwi portfolios are slanted towards tourism and commercial property.
- **Pacific peoples are also heavily involved in the tourism industry**. Around 15% of those involved in the Pacific Business Trust are in the tourism industry or areas reliant on it.

International tourism has been one of New Zealand's largest export earners over the last few years

- In the year ended March 2019, **international tourism's contribution to total exports was $17.2 billion (20.4% of exports)**. The export receipts from dairy products, including casein, totalled $15.6 billion (18.5% of exports).
- In the year ended June 2019, **cruise ship expenditure in New Zealand totalled $569.8 million, an increase of 28.2%. Auckland and Tauranga ports recorded the largest total spending.** In the year ended June 2019, Auckland spend totalled $192.5 million, up 31.9%, with Tauranga recording $90.3 million, up 34.8%.
- Expenditure by international students studying for less than 12 months e reached $3.9 billion (course fees, living costs, airline expenses), an increase of 10.4%. The number of short-term arrivals for education purposes (studying for less than 12 months) totalled 67,158, up 0.1%.

Tourism has also underpinned New Zealand's economic standard of living and social wellbeing in other ways – e.g. tourism operators often support a range of other services in regional communities, while international passengers support air freight connectivity and costing.

Contribution to GDP (%)	Number directly employed	Employment share - direct (%)	Number indirectly employed	Employment share – indirect (%)	Proportion of workers Māori (%)	Proportion of workers Pacific People (%)
5.8%	229,566	8.4%	163,714	6.0%	15%	15%

Impacts of COVID-19

Current state

Following the Alert Level 4 lockdown, arrivals slowed towards a stop. 71% of all arrivals were New Zealand citizens. Most other arrivals from other nationalities on the week ended 15 of April are likely to have been New Zealand citizens returning home on foreign passports.

- Tourism Industry Aotearoa (TIA) say their membership hotels revenue was down 57% in March, expected to be worse in April. **Most tourism businesses revenue was down to 0**.
- **Despite the wage subsidy scheme, TIA said 100, 000 jobs (out of 400, 000) in the tourism sector could still disappear**.
- Tourism was also badly hit in terms of time, as the impact of COVID-19 started with the loss of Chinese tourists in January.

Nationality	Arrivals (week ended April 15)	Same week previous year	% change
Total	1,185	124,282	-99%
New Zealand	846	44,319	-98%
Australia	22	24,476	-100%
UK	35	6,260	-99%
Rest of Asia	46	15,626	-100%
China	32	12,019	-100%
US	12	6,831	-100%

Source: Customs NZ

Future outlook

There is a high degree of uncertainty around when borders will open again, and when international tourism might resume. The tourism sector has been hit by significant upheaval, for example in the aviation and cruise ship sectors where travel has halted almost completely. The OECD estimates that international travel will decline by between 45% (if recovery can start in July) and 70% (if recovery is delayed until September) of 2019 levels.

- **Given the massive damage caused by these factors, it is unlikely that visitor numbers will return to levels experienced previously in the near or medium term.** This means the sector is unlikely to be able to support the number of businesses and jobs that currently exist. This will present particular problems for some regions whose economies are based on international tourism.
- **Domestic tourism is expected to be the main driver of tourism activity for a significant period**. Many domestic tourism businesses have been significantly damaged by the current situation. Early research suggests Kiwis may have significant appetite to travel domestically, once the health situation allows, but there is uncertainty around future confidence to travel and the impact of the economic downturn on disposable income. The profitability of some activities, attractions and accommodation also relies on prices set for international visitors, which may be perceived as too high by some Kiwis.
- Forecasting 2021 losses is speculative. With international business events at best severely reduced, and with domestic demand highly uncertain, income for most operators **is likely to remain below 50% of pre-COVID-19 levels**.
- **Recovery in the tourism sector could be staggered, with some markets opening earlier than others (e.g Australia)**. Recovery will be dependent on the survival/retention of key tourism assets which drive demand both to New Zealand and to specific regions. The Minister of Tourism is leading the development of a recovery strategy for the New Zealand tourism industry in a post-COVID world.

Key Take Outs

- The tourism industry has been very badly hit by COVID-19, and has collapsed to essentially zero
- It was a large employer of New Zealanders both directly and indirectly, as well as a large employer of Māori and Pacific populations
- Domestic tourism is expected to be the main driver of tourism activity for the foreseeable future

EROSPACE

24/04/2020

industry profile

Note: The majority of this report draws on research done on the New Zealand space sector. All references to the space sector below are an insight to a subset of the broader aerospace sector. Aerospace is not an industry classified by Stats NZ which limits the amount of data we have available. Space-specific data has been obtained from specially-commissioned studies published by MBIE in 2019.

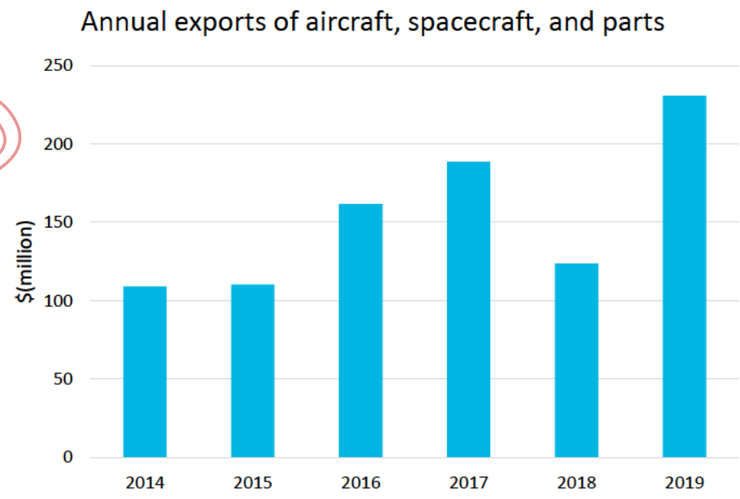
Significance

- **The New Zealand space sector is small** in comparison to global market (estimated at USD 400 billion turnover in 2019), **but there is room to expand this share and grow the sector**.
- **The annual contribution of the New Zealand space sector to GDP was estimated at $1.69 billion in 2019 (0.73%)**.
- **Space directly supports an estimated 5,000 full-time equivalent roles (FTEs).**
- There are **strong Space Manufacturing and Space Applications sub-sectors** (and notable companies such as Rocket Lab and Dawn Aerospace contributing to this).
- **The New Zealand space economy largely consists of small, new businesses. However, there are some well-established companies earning significant revenue.** The most commonly reported turnover range was $200,000 to less than $2 million. The most commonly reported full-time equivalent (FTE) range was 1-19 employees.
- There are **sector hubs in Auckland and Christchurch**, with some key infrastructure in regions including Hawkes Bay, Southland and Otago. Organisations in the Space Manufacturing sub-sector, are typically concentrated in Christchurch and Auckland.
- **New Zealand exported $230.56 million of aircraft, spacecraft and parts in 2019.**
- The **drones sector** is a new sector, and there is limited data on its current size or performance. However, more than 120 operators have received part 102 certificates from the Civil Aviation Authority (CAA).
- The value from using drones for commercial purposes in New Zealand has the potential to be between $4.6 billion and $7.9 billion over the next 25 years. It is also estimated that nearly 8,000 New Zealand businesses have used a drone in the last six months.

Performance

- **New Zealand's aerospace sector is new and growing fast.** Many nations' aerospace sectors now possess average productivity levels and wages far exceeding their national averages.
- New Zealand has one of the **world's leading** small launch providers and a second launch company ready for sub-orbital testing. There is also **world class expertise** in niches such as clean satellite propulsion, launch vehicle guidance systems, high-altitude drones and space biochemistry.
- **R&D is a key feature of the space economy and was valued at $61 million in 2019 (7% of space GDP)**.
- **New Zealand's recent investments** in the Environmental Defence Fund's MethaneSAT mission and NASA's Cyclone Global Navigation Satellite System mission will scale up New Zealand's space infrastructure.
- The **adoption of aerospace technologies** by primary sector participants is also likely to support more sustainable farming practices. There is much future potential for such technologies to be more widely applied within New Zealand.
- For aerospace to become, and remain, competitive on both a national and global scale **requires deep expertise supported by significant capability building investments**.

Contribution to GDP (%, 2019)	Number employed (2019)	Employment share (%, 2019)	Export share (%, 2019)	R&D expenditure ($m, 2019)
0.72	5,000	0.22	0.27	61



Source: New Zealand Trade Dashboard, Stats NZ

Impacts of COVID-19

Current state

- **The space sector, as a non-essential industry, has seen significant disruption under alert level 4.** All launch, manufacturing and physical testing activity has stopped, as has laboratory or workshop based R&D.
- **Many of our space manufacturing businesses are involved in international supply chains which may be disrupted for some time.**
- **Aerospace occupies a deep and broad value chain** from advanced manufacturing, and fabrication, design, and engineering services all the way through to technical consulting and professional services. Aerospace companies have had to defer sales and R&D activities and have greater uncertainty about capital raising.
- **The CAA is currently dealing with a number of challenges** including a review into its culture and a significant reduction in revenue from passenger levies due to COVID-19. To successfully grow the drones sector it is essential that CAA has the capacity and capability it needs.

Future outlook

- **Growth in the aerospace sector is likely to boost productivity, create additional jobs, and intensify knowledge spill overs and reputational effects**. Through commercialisation, innovation, and skills development, a growing aerospace sector has the ability to support strong economic growth in other sectors by connecting them to rapidly growing international markets and helping future-proof the local economy.
- **Drones have the potential to change the way we move people and freight, and the way we do business in New Zealand.** The positive impacts of drones could benefit almost every sector of the economy.
- New Zealand's enabling regulatory environment is critical to the success of firms in the aerospace sector. This is a key reason why we have growing space and drone sub-sectors today.
- There are also opportunities to conduct **pre-launch airborne validation and calibration of satellite sensors** to generate valuable scientific data (including for government and industries such as agriculture) and to lead to new commercial opportunities in this field.
- **Wider support** to impacted aerospace firms would take the form of support with testing and fabrication facilities, provision of expertise and opportunities to access revenue through generating solutions that meet government needs.

Descriptions

The **aerospace sector** encompasses the research and development, design, manufacturing and launch of satellites, drones, flight vehicles, space launch vehicles, and spacecraft (manned and unmanned), as well as upstream and downstream services concerning the provision and use of aerospace data.

The **New Zealand space sector** is a sub-component of the aerospace sector, comprising space manufacturing, space operations, space applications, ancillary services, research and development, and Government.

Key take outs

- Aerospace is a sector of growing significance for New Zealand.
- As it is a highly specialised industry involved in international supply chains, it is likely that border restrictions and disruptions to freight will impact the industry for some time.
- There is an opportunity to invest to grow the aerospace sector to help drive New Zealand's recovery and move our economy from volume to value.

AGRITECH

24/04/2020

Industry profile

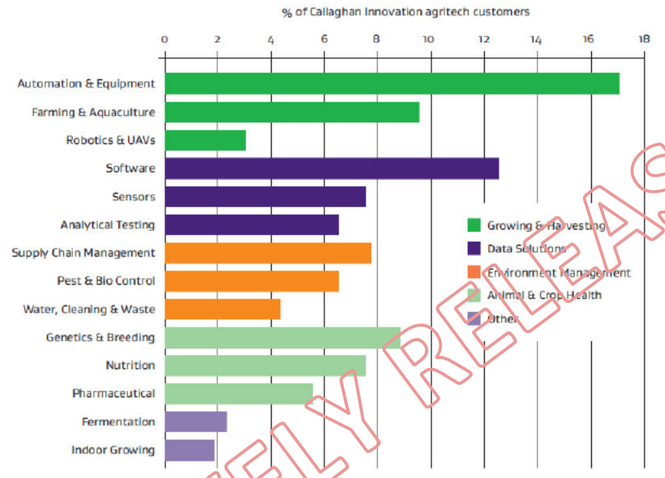
The agritech sector refers to manufacturing, biotech and digital-based technology companies that are creating product, service, IP and value chain solutions for the agriculture, horticulture, aquaculture, apiculture and fishing sectors with the aim of improving yield, efficiency, profitability, sustainability, reliability, quality or adding any other kind of value. Due to the absence of a universally agreed definition of 'agritech' and the cross-cutting nature of the sector, providing statistics on the make-up of the sector is challenging. Work to improve the measurement of the sector and develop more useful agritech statistics is underway, but has been interrupted by COVID-19.

Significance

- Government is aware of **over 950 likely New Zealand agritech companies**.
- The **agritech sector exports around $1.2b in goods[1]. This is approximately 2% of total goods exports**. Significant areas of exports include machinery & systems, fencing supplies and equipment and animal health products. New Zealand agritech's largest markets are Australia, the USA and China.
- At a high-level, in terms of overall revenue and employment**, the sector is dominated by several large firms** such (e.g. Gallagher, LIC, Ballance). However, **smaller start-ups, and growing innovative companies are also key contributors**.
- **A major part of agritech's significance is the value it provides to our primary sector**. Development and uptake of agritech has been a key driver in the performance of the primary sector and due to our relatively unique pastoral farming system, much of the advances in primary sector productivity, sustainability and value come from New Zealand-developed agritech.
- **The benefits of the agritech sector are largely felt in regional New Zealand, where the primary sector is focussed**. Additionally, there are several regional clusters of agritech innovation, including animal and crop health in Canterbury, robotics and automation in Bay of Plenty, and automation and data solutions in Auckland

1 According to very limited, but best available data related only to agritech exports for pastoral farming. This figure excludes not only significant agritech services, but also several product areas)

Callaghan Innovation agritech customers areas of activity



Performance

- **On-farm productivity of the agricultural sector has grown at a compounded annual rate of 3.5 % over the ten years to 2018 with New Zealand agritech a key driver behind increases** .
- Quantitative data on average wages for the sector is not available, but anecdotally the sector provides relatively **highly skilled and high-value employment**.
- Anecdotal evidence from industry suggests that a **shortage of specialist skills is an issue for the sector**, particularly in the fields of data science, robotics and product management, as well as software development more generally.
- **$640m was spent on R&D for the food and fibre sector in 2018** ($310m by business, $260m by Government and $70m by higher education). R&D for the food and fibre sector made up one-third of Government R&D spending in 2018.
- New Zealand has produced world-leading expertise and developments in several areas of agritech (e.g. automation) and has the opportunity to leverage these internationally.
- There is a lack of data on emissions for the agritech sector itself. However **agritech is a key mechanism for reducing the emissions of the food and fibre sector**, which makes up 49% of New Zealand's total GHG emissions. From 2007-17, agriculture emissions decreased at a rate of 0.1% a year while its contribution to GDP (in real terms) grew at a rate of 1.8% a year. Exporting New Zealand agritech solutions also has the potential to reduce emissions worldwide.

Impacts of COVID-19

Current state

- The **agritech sector is performing relatively well compared to many other sectors of the economy**. Though overall it has been negatively impacted by COVID-19, a greater impact has been softened by its strong link to the primary sector, which has been able to continue operating and for which demand remains high.
- A Callaghan Innovation survey of agritech customers showed that 51% of customers are seeing opportunities from the crisis. While 29% are relatively unaffected, and almost 20% are significantly unsettled or negatively impacted by COVID-19.
- **The impact of COVID-19 is being more strongly felt by start-ups in the sector, who are struggling to access international opportunities and to attract investment, and who have the reduced ability to ride out the negative impacts**. New investments are effectively frozen, with very few deals occurring. 36% of Agritech NZ survey respondents noted access to funding as a big issue.
- 42% of Callaghan agritech customers report either a **cashflow runway that is either 'very short' or 'run out or nearly gone', which highlights the urgency of the problem for firms**.
- A survey of the industry conducted by Agritech NZ, the industry representative body highlighted several key issues:
    - Access to customers was the major issue reported with many highlighting cancelled or delayed projects or drops in income.
    - The lockdown has impacted on external suppliers and manufacturers, making it difficult to obtain essential goods and services.
    - The restrictions on air travel are seen as a key disruption for a significant part of the sector. While a large part of the agritech sector is focussed on the NZ market and is relatively unaffected, over half of respondents reported this disruption as impacting on their business. This has both short and long-term impacts for the sector. There are acute short-term financial impacts such as the lack of air freight stopping NZ agritech firms from reaching their customers (43% report a negative impact on exports) or a disconnect from overseas operations, and longer term impacts such as the inability to attract investment or develop connections and business opportunities overseas.

Future outlook

- **There remains significant growth potential for the agritech sector, though short-term struggles are anticipated**. Though there will likely remain a strong demand for food and fibre products through the global recession, prices may fall overall, and higher value products that service the hospitality sector will be particularly negatively affected. Investment in agritech can often be seen as a 'nice to have', and given difficulties and uncertainties faced by the primary sector, farmers are likely to be more conservative in their investments.
- In the long-run however, the **challenges in the primary sector that fuel demand for agritech continue to grow** and in several ways have been accelerated by COVID-19 (e.g. lack of labour migration and social distancing requirements increasing the need for robotics and automation), presenting strong domestic and international opportunities for the NZ agritech sector, including:
    - Growing global demand for nutrition requires innovation in agritech space to enable higher production with land constraints.
    - Existing strength in primary sector and world-class research taking place.
    - Increased cost of labour and labour shortages driving demand for automation.
    - Push towards increased sustainability in farming practices is driving research and demand for agritech solutions.
    - Technological and business development innovations posing both opportunities and threats to primary sector, requiring agritech innovation.
- However the challenges, which have historically restricted the NZ sector from seizing global opportunities remain, and COVID-19 has introduced new challenges for the sector.
    - Need to better connect with global opportunities, and understand and address problems beyond those affecting our traditional pastoral farming systems. Travel restrictions resulting from COVID-19 of an unknown duration will make this more difficult, restricting the ability to export and develop key business connections and future business.
    - Need to improve the commercialisation flow of investments into agritech R&D.
    - Increased investment into NZ agritech is required, including better access to smart, connected capital. COVID-19 has increased caution among investors, restricting capital flow to start-ups.
    - A lack of data interoperability between agritech systems and platforms discourages uptake and innovation.

Key take outs

- Agritech is highly-important to NZ primary sector performance and has significant global opportunities in a number of niche areas where NZ firms are world leading.
- Link to primary sector provides protection but faces declining domestic uptake. and threat to international opportunities
- Strong opportunity to support agritech and improve performance of primary sector by increasing domestic uptake and chance to differentiate into high-value global export opportunities.

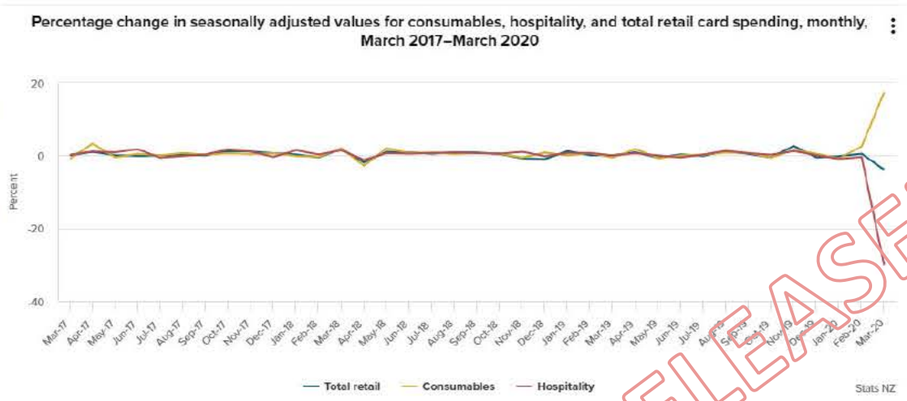
RETAIL

01/05/2020

...try profile

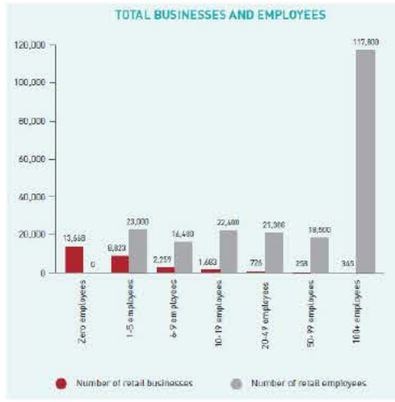
Significance

- **Retail comprises 5.3% of all businesses in New Zealand.** It is a diverse sector covering everything from the family grocer, to high-end fashion, cars, to fuel and building supplies.
- **Retail is a large employer, accounting for almost 9.6 % of New Zealand's workforce.** It directly employs over 219,400 people in retail-related occupations.
- The sector is dominated by **small to medium sized enterprises.** 89% currently employ fewer than 10 people. At the other end of the scale only 345 retail businesses employ over 100 staff.
- The average net margin for retail businesses was 3.6% in 2018. Competition coupled with high costs keeps pressure on margins.
- **Retail businesses are relatively short-lived with the five-year survival rate for businesses that opened in 2012 just 39%.** (2018)
- **New Zealanders' online spending is estimated at $4.2 billion annually. However, 33% of online spending in 2018 was with offshore retailers.**
- Electrical and electronics goods (including computers and appliances) saw the largest growth in online spending in 2018 compared to 2017.
- In 2018, the average New Zealander spent close to $22,000 with retailers in New Zealand, of which $2,843 was paid to the Government in tax.



Number of retail premises	Number employed	Proportion total workforce (%)	Proportion of total businesses (%)	Average hourly retail wage (approx)
35,205	219,400	9.6%	5.3%	$22.79

Retail NZ (2020)



Impacts of COVID-19

Current state

- Under Alert Level 4, Retail NZ estimated **7,100 jobs would have been lost across the sector**. This number will likely grow when the Government wage subsidy ends.
- **Total retail sales fell $231 million (3.9 %) in March 2020**, after adjusting for seasonal effects, the biggest fall on record in both percentage and dollar terms.
- **Fuel spending was down $113 million (19 %).** This coincided with both the drop in pump prices in the month and lower volumes sold due to New Zealand moving into the COVID-19 Alert System from 21 March, which restricted all non-essential travel.
- Sales of clothes and shoes (apparel) fell $98 million (31 %).
- Furniture, hardware, and appliances (durables) sales were down $57 million (3.9 %) and motor vehicles were down $38 million (20 %).
- Groceries (consumables) sales jumped $376 million (up 17%) in March.
- Spending at domestic online retailers was up 24% on March last year, boosted by the higher spending on groceries and alcohol as consumers bought more ahead of the COVID-19 lockdown.

Immediate impacts

Stores remain closed

- Under Alert Level 4 and Level 3 restrictions the majority of retail stores remained closed.
- Where possible online sales were occurring to get much needed cashflow. But brand recognition tends to favour larger stores over smaller operators.

Unknown impact of intangibles – Kiwi pride and goodwill.

- During the course of the lockdown there has been a noticeable consumer preference to buy local, backed by the sentiment of 'Keep a Kiwi in a job'. Ministers have also publically backed the 'Think Local, Buy Local' campaign. This on-going campaign will likely have an impact on consumer choices – but is hard to quantify at this stage.

Getting more local businesses to focus on E-commerce

- The on-going digital transformation of the sector will be a key pillar to reinventing retail business models in a COVID-19 world.
- The Get eCommerce Movement (GEM) initiative by Kiwi tech firm Zeald has already allocated 500 free websites – with more SMEs on the waiting list. Another Kiwi tech firm Acronym has set up homedelivery.kiwi/clickcollect.kiwi to get SME's online quickly and selling – who don't currently have a website. Getting more SME's online is a key focus for MBIE's Small Business Team.
- New Zealanders are already big online spenders, and this trend is likely to continue, building on the 'Think Local, Buy Local' campaign coupled with the growing 'Keep a Kiwi in a job' sentiment could help divert some spending with overseas retailers back to local firms.
- While strong restrictions applied under Alert Level 3 – retail under Level 2 or even Level 1 will also be vastly different. Examples from overseas show that when restrictions were eased, consumers did not immediately swarm back into the shops – amid fears of contracting the virus. Therefore, getting more retail businesses offering E-commerce solutions could help with their survival.

Future outlook

- **Sector performance is closely tied with consumer confidence.** During the GFC in 2009, the sector experienced a major slump – consumers worried about job losses curtailed spending on all but essential items. The impact of COVID-19 however, includes other factors that were not in evidence during the GFC, which when all combined could mean a more **severe and potentially longer impact.**
- These additional factors all relate to on-going immigration restrictions, in effect less people, spending less money. Visitor arrivals are likely to stay low for at least eighteen months, this coupled with lower international student numbers will have an effect on overall retail spending. In Australia, modelling shows for every $1 lost in university tuition fees, there is another $1.15 lost to the broader economy due to international student spending (note not all of this relates to retail spending).
- Restrictions to large gatherings could also have a flow-on effect to the sector as events such as international conferences, large sports events and other attractions are cancelled.
- Any downturn in the construction sector will also likely affect durables spending in the short to medium term.
- It is unknown how long the preference for 'Think Local, Buy Local' will continue to influence online choice.

Key Take Outs

- Large number of workers employed within the sector.
- Sector performance is closely tied with consumer confidence. During the GFC in 2009 the sector experienced a major slump. The impact of COVID-19 however, includes other factors that were not in evidence during the GFC, which when all combined could mean a more severe and potentially longer impact.
- Getting more retail businesses online capable, coupled with the consumer swing to 'Think Local, Buy Local' backed by the sentiment of 'Keep a Kiwi in a job' could help ensure the survival of smaller retailers.
- Getting more businesses online could also assist in the long-term with increasing retail margins and therefore have an impact on survival rates .

ENERGY AND RESOURCES

01/05/2020

y profile

The Energy and Resources sector includes electricity generation and supply, gas supply, mining, and petroleum and coal manufacturing.

Significance

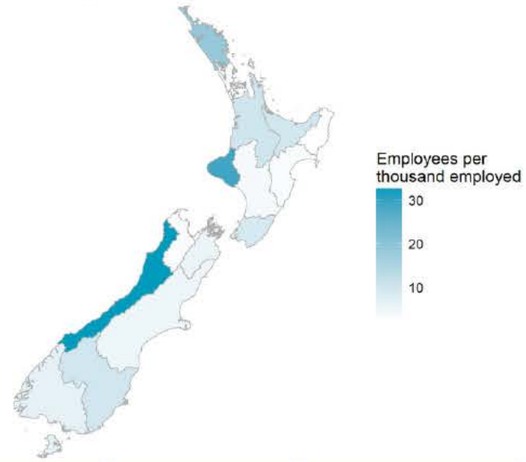
- Energy is a service or commodity that is integral to modern life. It is a necessity for the operation of our economy, and the wellbeing of our people.
- Our natural resources have a key role in the production of energy (e.g. gas) and the materials needed for meeting New Zealand's growth challenges. This includes aggregate from quarrying for building infrastructure and housing and potential exports of sustainable high-value clean tech minerals.
- **The sector employs 17,600 workers, most of whom are New Zealand residents, with less than 300 work visas in the sector as of January 2019. Māori employment in the sector is strong, at 16%.**
- **Average wages are higher than the New Zealand average, at $1,819 per week** compared to a national average of $1,016 per week.

Performance

- **New Zealand's energy system (along with global energy systems) is in long term transition towards more low carbon, renewable energy sources.** The Government has a 2050 net zero emissions target (for all non-methane gases) and an aspirational 100% renewable electricity target.
- **Greenhouse gas emissions in the sector have been declining since 2012** and are currently at 6,384 kilotonne CO_2 equivalents. However, the sector remains a high emitter behind the primary sector and transport.
- **R&D spend by the sector was $104 million in 2019**, much higher than the primary sector but much lower than professional services.

Figure 1: Energy and resources employment by subsector

Figure 2: Energy and resources employment intensity



Number of firms	Number employed	Proportion of workers Māori (%)	GHG emissions (kt CO2-e)	Average weekly earnings ($, 2019)	R&D expenditure ($, 2019)	Union membership (%)	Work visas (as at 01/01/2019)
1,176	17,600	16	6384.262	1,819	104 million	16	294

Impacts of COVID-19

Current state

- **Energy was classified as an essential service during Alert Level 4** so there was little short term disruption, with energy generation and production generally continuing with limited staff onsite. However, **the sector has been impacted by social distancing requirements**, which make it harder to do some work such as maintenance, and a reduced demand for electricity and other fuels such as petrol.
- NZTE has observed that the sector remains busy but international travel and export restrictions were a challenge, for example coal exporting was suspended under Alert Level 4.
- **Demand for electricity and fuel is expected to rebound** now that New Zealand has exited Alert Level 4, although it will be unlikely to return to pre-COVID-19 levels until general economic activity has recovered.
- **Affordability of energy in New Zealand is an ongoing issue**, and as a result of COVID-19, more consumers are experiencing energy hardship. Measures in the Electricity Price Review are designed to address long-term energy affordability issues for consumers, including initiatives to address energy hardship.
- Energy efficiency projects are key to reducing emissions in the short term. However **due to COVID-19, firms may have less money to invest in such projects and may deprioritise energy efficiency improvements**. It will be important to reduce other barriers to adoption of clean energy technologies and cost-effective measures to reduce emissions that can work alongside the NZ emissions trading scheme.
- The current global over-supply in the oil market pushing prices down to historic lows will also make our long-term transition away from a reliance on a petrol/diesel vehicle fleet more difficult.

Future outlook

- At this early stage it is difficult to predict the full effect of COVID-19 on the energy system. However, some broad predictions can be made based on expected trends and changed economic patterns.
- The World Energy Council's trilemma – energy affordability, sustainability and security, helps articulate the key long term system transition challenges, as shown in Table 1.
- Government has already invested in the National New Energy Development Centre in Taranaki and there will be scope for New Zealand to develop new energy sources and businesses around the Centre.
- RefiningNZ and the Tiwai Point Aluminium Smelter are two large regional businesses that could face change/disruption due to COVID-19, but it is too early to tell exactly what this might be.

Table 1: Long term energy system transition challenges

Topic	Challenges and opportunities
Affordability	We need to ensure electricity is affordable for households – ensuring people can afford their power bills and enabling the uptake of electric heating options and electric vehicles. Affordable electricity also opens up opportunities to electrify industrial processes currently using fossil fuels. In the long term, the regulatory system may also enable consumer-side innovation, such as participation in demand side initiatives to manage costs.
Sustainability	Growing the supply of renewable energy is key to reducing greenhouse gas emissions – not just for the electricity sector, but also to enable alternatives to fossil fuel use in transport and industry. In the longer term, new fuels such as hydrogen may assist in decarbonisation. There is already a significant work programme underway for transition of the energy system, and a significant programme of work in the resources sector – for example the review of the Crown Minerals Act. The response to COVID-19 means we are re-assessing options in some areas. For example, any government investment to support recovery from COVID-19 could include energy projects with significant economic stimulus/decarbonisation co-benefits.
Security of supply	New Zealand's strong dependence on imported oil products makes it vulnerable to disruption in supply chains. In the longer term, transitioning to more domestic fuel sources such as further electrification of transport, biodiesel and hydrogen has benefits for fuel security through increasing self-sufficiency. In the medium to long-term we need to ensure that the gas market continues to provide a peaking role for energy supply. This will be at risk if any large companies such as Methanex were to drop out of the market.

Key take outs

- The energy and resources sector has been less impacted than other sectors by restrictions as part of the response to COVID-19 but is facing reduced customer demand for electricity and other fuels. Demand is expected to rebound as economic activity recovers.
- New Zealand has a goal of transitioning to low carbon, renewable energy sources. Government investment to support economic recovery in response to COVID-19 provides an opportunity to invest in projects with energy affordability, innovation and decarbonisation benefits.
- Energy affordability is an ongoing issue for New Zealanders and may be exacerbated by the economic impacts of COVID-19.

CREATIVE SECTOR

01/05/2020

Industry profile

The creative sector includes: advertising and architecture*, crafts, design, fashion, film and TV, games, mixed reality, music, performing arts, photography, publishing, radio, software (covered in the Digital Technologies A3) and visual arts.

Significance and performance

- The creative sector is complex and cross-cutting. There is no agreed international approach to measuring the sector.
- We lack comprehensive and consistent data on NZ's creative sector but will be working with the Ministry of Culture and Heritage and WeCreate to address this. The best data we have now is:
    - **The creative sector contributed $17.5 billion to GDP in 2016 and directly employed over 39,000 creative people and over 44,000 support people (83,000 in total)** according to NZIER research commissioned by WeCreate. Non-creative industries employed a further 47,000 creative people.
    - **A more narrowly defined slice of the arts and creative sector contributed $10.8 billion or 3.6% of GDP, and employed 92,381 people in 29,258 business units, at March 2019** (research for MCH).
- The **sector is split with some industries more high-value commercially**, with significant revenues and exports, (particularly CreaTech sectors such as Film and Gaming), while **others are lower value economically, while providing important artistic and cultural value**.
- Around **one third of the sector is self-employed** – twice the proportion across the total economy – and there are very few large firms. 'Portfolio' careers are common.
- **Median creative income was very low** for people surveyed by Creative NZ in 2019 - $15,000. However income reflect the divide between more and less commercial sectors – game developer respondents' median was $61,500, dancers' $17,500.
- **Creative jobs are resistant to automation and have been growing globally.** In Australia and the UK employment growth in the sector grew at around twice the rate for the total economy between 2011-16.
- Māori art and performance are a core part of the tourism sector. There is **unrealised potential for Māori and Pasifika** economic development across creative industries, noted in ATEED's draft Creative Industries Strategy 2030.
- There are **few, if any, natural resource constraints** on growth in many creative industries, but there is reliance on travel and public gatherings.

This data is from industries that have commissioned research or undertaken surveys (so is not directly comparable):

Industry	GDP	Revenue	Direct jobs	Direct & indirect jobs	Other
Advertising	$6 bn	-	12,000	44,000	-
Gaming		$203 mn	683	-	96% revenue from exports
Publishing	$97 mn	-	1,326	3,836	-
Recorded music	$336 mn	-	3,000	6,300	Live performance supported 47% of employment
Screen	-	$3.4 bn	14,000	31,000	2,829 post-production firms

- The creative sector is **closely linked to the hospitality and domestic and international tourism sectors**, through events, live performance, music , productions and music and festivals. For example, WOW domestic and international visitors brought $28 million to Wellington in 2019, up from $26 million in 2016.
- The sector is **key to supporting national identity**, social cohesion, social connections and mental health.
- We have a **baseline of New Zealand capabilities** in some areas, for example, in screen production and digital effects, mixed reality, gaming, music, and educational publishing.

Impacts of COVID-19

Current state

Industries relying on live performance, events and gatherings stopped under Alert Level 4.

- All **screen production halted**, suspending 47 NZ Film Commission projects. Investor funding is at risk if productions are not completed
- **Venues (pubs, cinema, theatres, galleries), had no events or visitors**. Over 5,000 events were cancelled with estimated 422 FTEs already or soon to be lost. 334 entertainment technology respondents expected that 90%+ of their anticipated income would be lost from March-June 2020.
- The **music sector** estimates losses of $234m in 2020 – over a third of total revenue – with an estimated 2,390 jobs at risk in live music.
- NZ **Comedy** Festival cancelled - $1.75m in ticket sales, 150+ NZ performers; NZ Institute of **Photography** members (223) reported losses of $2.3m in the month to 17 April.

Industries impacted by reduced demand and Level 4 restrictions

- **Publishers** were unable to sell books in Level 4 , one third are reducing staff and over a quarter anticipate losses of more than $45,000.
- Reduced advertising (see Professional services A3) has affected **media companies,** with an estimated drop in advertising revenue of 50 to 75%.
- 85% of 79 graphic design firms surveyed report work cancelled or postponed
- NZ **fashion design** and manufacturing firms rely on physical as well as online sales, with only online sales resuming under Alert Level 3.

Industries with a strong focus on digital are managing

- **Gaming studios** have increased audiences and most see opportunities, although work from home teams are operating at 70-80% capacity.

Future outlook

A large proportion of the creative sector will not be able to operate fully, or at all, until Alert Level 1 or below. MCH estimate losses of around $1.8bn in arts and creative GDP and 11,000 jobs in the year to March 2021. However, for some sectors, opportunities for high-value growth remain.

- Global demand for new content will be huge for games, screen and education materials.
- NZ has opportunities for screen, music and performance if we can be a COVID-19 safe spot. The screen sector is working to develop safe industry protocols for Level 3 and below as some work may be possible. Screen production globally has been disrupted by COVID-19 and New Zealand may be viewed as an attractive and safe location for production. The NZ Film Commission estimates allowing work visas with strict quarantine requirements to around 200 people over the next five months would bring back over 3,000 stood down jobs and $400 m international spend.
- The creative sector will likely be particularly affected by reduced demand. People – and businesses – view creative goods and services as discretionary spending and demand from tourism will be much reduced when it does recommence. NZ fashion and publishing are vulnerable to cheaper imports, particularly while all shopping is online.
- Businesses that have not or are unable to adapt to new digitised business models in industries such as print and broadcast media, publishing and retailing for books and music, may fail.
- Creatives who rely on live performance for some or all income are exploring ways to use digital platforms to offer and monetise online performances. It is likely that only a small proportion of the money they would get for a live performance will be raised this way. In combination with already low wages, and many fewer jobs in sectors such as tourism and hospitality that are used to support creative careers, incomes may be unsustainable.
- We also risk the failure of industry and professional associations whose members are no longer able to afford subs. The NZ Comedy Trust is facing a deficit of $300k.
- The Ministers of Arts, Culture and Heritage and Broadcasting, Communications and Digital Media are considering support packages for their portfolio industries. Note that the Arts, Culture and Heritage portfolio is focused on the parts of the sector that receive government funding and not the more commercial parts.

Key Take Outs

- Impacts on the creative sector vary by industry, with game development doing all right, while industries relying on travel, live performance, events and gatherings stopped and struggling.
- There are opportunities for screen and music if NZ becomes a COVID-19 safe spot.
- Lack of tourism will impact on demand even when gatherings can begin.

NTERNATIONAL EDUCATION

01/05/2020

y profile

Description International education includes international students coming here to study, New Zealanders travelling overseas to experience a global component in their education, and people online and internationally, learning through products, services and approaches built in New Zealand.

Significance and Performance

- **International education delivered in New Zealand contributes $4.8 billion (in 2018) to the New Zealand economy. This increases to $5.1 billion when education services delivered internationally are included**. International student tuition fee revenue is $1.2 billion.
- **International education is New Zealand's fourth highest export earner.**
- **International education supports an estimated 47,490 New Zealand jobs.**
- **Around 123,000 international students study each year in New Zealand.** They are spread across all education sectors – universities, polytechnics, private training establishments (PTEs) and schools.
- Although student numbers have decreased slightly since 2016, the sector's economic contribution has increased.
- The economic contribution per student ranges between $31,500 (for English language school students) and $60,190 (for primary school students) with an average across all international students of $39,290.
- **The economic impacts align with where international students live in New Zealand**, but there are some flow-on effects between regions. **Auckland captures just over half** (56%) of the economic contribution of international education, with the next largest contributions received by Canterbury (10%), Wellington (9%) and Waikato and Otago (both 6%).
- **China and India are the two largest sources** with 32% and 16% of students respectively coming from these markets. Japanese and South Korean students account for 8% and 6% of students, respectively.

Economic Contribution	Employment share (%)	Export share (%)
$5.1 billion	2.08	5.93%

Note
Economic contribution captures spending on tuition, non-tuition spending, living costs, student tourism and the expenditure from visiting friends and relatives

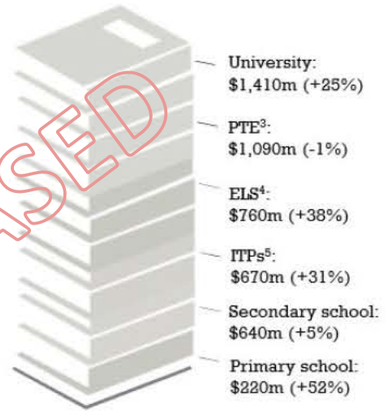
Total value of onshore economic value
$4.8b (Value Added + tax)
$760m increase since 2016

Total value of offshore activity[2]
$0.3b
$60m increase since 2016

Expenditure by international students supports
47,490 jobs

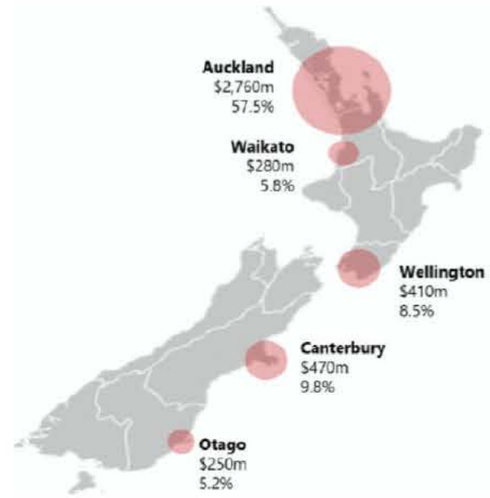
Additional value generated from visiting friends and relatives [6]
$460m

Sector



PTE: Private Training Establishments
ELS: English Language Schools
ITPs: Institutes of Technologies and Polytechnics

Contribution by NZ region: value and proportion of total (Value Added + tax)



Sources: Economic value of international education in New Zealand 2017-2018, Education New Zealand, ELS is based on enrolment data

Impacts of COVID-19

Current state

- **Temporary visa holders, including student visa holders, are unable to enter New Zealand at the present Alert Level.**
- **The number of international students in New Zealand will continue to decline, the longer that border restrictions are in place, putting at risk an increasing percentage of tuition fee revenue**. Currently there are only around 51,000 international students in New Zealand. The degree of financial stress depends on how long the borders remain closed, and on how reliant providers are on revenue from international students. Some smaller PTEs may be at greater risk of closure. A number of providers are funded solely by international students, so we expect some of these will close.
- **The Government has extended visas of temporary migrants in New Zealand**, including international students, to ensure that there is some certainty for them as they face the challenges of being in a foreign country at this extraordinary time. International students in New Zealand with visas expiring will have their visas automatically extended to 25 September 2020 at no additional cost.
- **The New Zealand Government has relaxed visa conditions for a short period to allow international students to work in essential services.** Students employed by some supermarket chains, in the healthcare sector including aged residential care, and in essential services will be able to work for more than 20 hours per week for a short period.
- **The Ministry of Education has enabled international and domestic school students to access online learning** through Te Kura, The Correspondence School. Tertiary providers have also offered teaching online where possible, including to international students.
- While the sector delivers great value in terms of international connections, research/partnership opportunities and economic value, pre-COVID there was work underway to address quality issues in the sector; lack of market diversification in terms of student source markets, students unable to fund their international education without relying on work while in New Zealand, and many students graduating (and seeking to remain long term) with generic qualifications that were not in skilled/shortage areas.

Future outlook

- **There is a high degree of uncertainty about when borders will open again, and when international students will return to New Zealand.** Key to New Zealand's international education recovery is our reputation as being a **safe and welcoming destination** and building on strategic international partnerships.
- The Ministry of Education and Education New Zealand are developing an **International Education Recovery Plan** to address the effects of Covid-19 on international education, intending to set an initial investment to realign the sector, and to put in place long term measures to ensure that New Zealand's international education sector is more resilient and diversified.
- There is an **opportunity** for government to work with sectors to build an international education sector that is offering new products and services, is maximising online developments established through COVID19 delivery and is more diverse in the markets we work with.

Key take outs

- International education is a significant industry in New Zealand, contributing 2.16% to GDP and 5.93% to total exports.
- Covid-19 will have significant and lasting impacts on the international education sector, with border restrictions preventing overseas students from taking up study in New Zealand.
- The Ministry of Education and Education New Zealand are developing an **International Education Recovery Plan**, to address the effects of the Covid-19 on international education, and put in place long term measures to ensure that New Zealand's international education sector is more resilient and diversified.

PRIMARY INDUSTRIES

01/05/2020

Industry profile

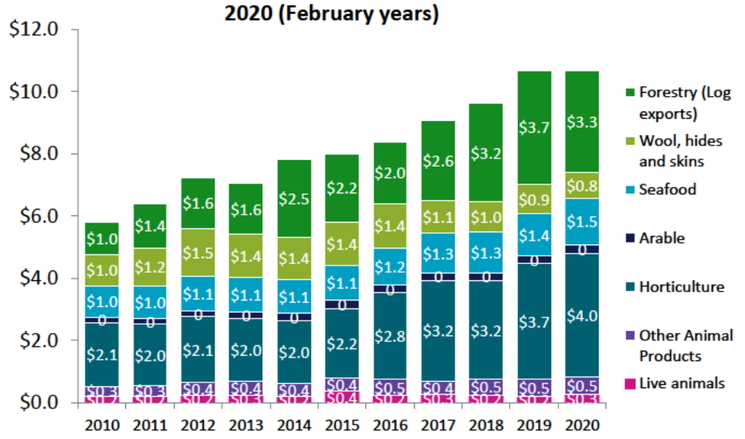
Significance

- **The primary industries contribute 5.7% to New Zealand's GDP.** This sector consists of agriculture (4.1%); forestry and logging (0.7%); aquaculture and fishing (0.2%); and forestry and fishing support services (0.7%).
- **Food and fibre production uses over half of New Zealand's land (53%).** It comprises farming (47%) and plantation forestry (6%), as well as much of the surrounding ocean.
- The primary industries support all of New Zealand's regional economies,. These are based on: dairy; red meat and wool; horticulture; wine; seafood; and plantation forestry. These industries are underpinned by many years of public and private investment in the supporting ecosystems, markets, science, skills and infrastructure.
- **The industry generates significant activity across many other sectors in the economy**, e.g. service industries; manufacturing; transport and logistics.
- **Farming is a dynamic industry undergoing a fundamental long-term shift to fewer, larger production units.** Over the last two decades, New Zealand has seen a 30% fall in farm unit numbers (-22,220). Fewer larger farms has seen employment of farm workers grow by 13,400 workers in the ten years to 2019. 17% of primary industry workers are foreigners on visas. But when including the loss of owner operators, total on-farm employment has seen a net loss of 12,300 jobs since 2000. On-farm jobs are down across most regions, other than Canterbury, Otago and the West Coast.
- **Numbers of dairy, red meat, produce, poultry and seafood firms have all declined primarily driven by consolidation**, while numbers of wine, arable/grain farming and "other" have increased by 1,760 units, indicating changing land use.
- Employment has grown moderately in fishing and aquaculture; forestry and logging; and agriculture and forestry support services. Note that as a sector "forestry and logging" captures only a portion of economic activity generated by forestry.

Performance

- **10-year productivity growth in agriculture is 3.5% per annum**, the second highest of any sector; the other three primary sectors grew productivity 1.3%, above the New Zealand average of 1%.
- Primary industries have low rates of both R&D and innovation. This is misleading as most R&D is funded through commodity levies invested by industry bodies on behalf of the industry, not by individual farmers, and through Government funding of Crown Research Institutes. Thus mechanisms to facilitate adoption of best practices/ agritech by farmers, such as farm advisors, are critically important.
- Exports of unprocessed or minimally processed primary products (e.g. logs, kiwifruit, apples, arable products) grew by $4.8b in the ten years to February 2020, a compound annual growth rate (CAGR) of 6.2%, driven by logs (+$2.2b) and horticulture (+$1.9b).
- When including processed (manufactured) food, beverages and fibre (see separate food and beverage manufacturing A3) goods derived from primary production account for **55% ($46.3m)** of New Zealand's total goods and services exports. In aggregate exports have grown at a CAGR of 5% in the ten years to 2019, adding $17.2b of export value.
- **Nearly half of New Zealand's Green House Gas emissions come from agriculture, mainly beef, dairy cattle and sheep (methane and nitrous oxide).** Emissions have not grown significantly since 2000, despite increases in production.

Exports of unprocessed / minimally processed primary products 2010-2020 (February years)



Note: Excludes manufactured exports, e.g. lamb, dairy products, processed food, beverages.

Source of charts: StatsNZ. MBIE analysis

Contribution to GDP (%, 2019)	Number of firms, 2019	Number employed, 2019	Proportion of workers Māori (%)	Proportion of workers Pacific (%)	Exports ($b, 2020)	Mean weekly earnings ($, 2019)	R&D expenditure ($m, 2019)	Gross greenhouse gas emissions, 2018	Current work visas, 2019
5.7%	65,300	130,100	14% (Forestry: 32%)	3%	$10.2b (12% NZ)	1,176	$53m	**15,634.17**	22,284 (17% of workforce)

Impacts of COVID-19

Current state

- **Primary food production is an essential service so is largely operating.** Logging has resumed under Alert Level 3.
- **The immediate outlook for most of New Zealand's key exports is stable, but there is considerable uncertainty. MPI expects forestry export revenue for the year ending June 2020 to be down $350mn.**
- Drought is still impacting the Auckland, Coromandel, Bay of Plenty and Hawkes Bay regions reducing production and risking animal welfare issues.
- There have been shortages of labour to pick crops, prune trees and vines, partially off-set by re-purposing labour from other industries. However re-deployed New Zealand workers are likely to be less skilled than experienced labour from the Pacific Islands.
- Debt levels in the dairy sector relative to income earned are significantly higher than other primary sectors with around 30% of total dairy sector debt held by highly indebted farms. The risk for many of these farmers is currently heightened by the effects of drought, declining land values, and reduced market liquidity for farm sales in some regional areas.
- Investment intentions are weak, weighed down by uncertainty associated with the pace and scale of change of some environmental regulatory policy proposals, e.g. fresh water, the Zero Carbon Act.
- Tightening lending criteria by banks may limit ability to borrow to address

Future outlook

The primary industries will continue to be the basis of significant economic activity in New Zealand, especially in the regions, with forestry playing a key role in achieving New Zealand's climate change targets. (e.g. through the 1 billion trees programme).

- The Primary Sector Council's (PSC) *Fit for a Better World* vision proposes shifting from an extractive, industrial model for primary production to one which works with and enhances natural ecosystems. This requires significant changes in some farming practices, e.g. to regenerative farming systems.
- The primary sector has significant potential to grow while also achieving sustainability goals, through changes in land-use, improved productivity, the application of agritech, altered farm management.
- Dairy and sheep and beef will continue to be significant and additional value can be created from **existing** production through further processing post-farm gate and marketing.
- Adding value/diversification will require new large platforms similar to wine and kiwifruit, while continuing to support existing growth industries: poultry; goat and sheep dairying; avocadoes; berries; aquaculture; and post-farm gate processed foods.
- The Productivity Commission notes that growth in horticulture (from a relatively small base) could play a meaningful role in reducing agricultural emissions. New Zealand could triple land in horticulture and crops creating both value and jobs (Coriolis Research).
- While increased tree planting is important, there are issues around the impact on rural communities, and a need to avoid mono-cultures which increase risk of disease and fire. Te Uru Rakau is leading work on a forestry strategy and on a Wood Processing ITP.
- MBIE is working closely with MPI on developing the Food and Beverage ITP focused on implementing the PSC's vision across the value chain.

Description: The primary industries are sectors making direct use of natural resources. Farmers, foresters and fishers grow, harvest or gather raw materials for consumption (e.g. fresh fish) or further processing (e.g. into lamb racks; cross-laminated timber). There are four sub-sectors: agriculture; forestry and logging; aquaculture and fishing; and agriculture and forestry support services. The latter includes a wide range of support services such as contractors, shearers, tree pruners, fencers and advisors.

Key Take Outs

- The primary industries will continue to be the basis of a significant economic activity in New Zealand, especially in the regions.
- These industries can grow through adding value, changing land use, improved productivity and the application of technology, while still achieving sustainability goals as articulated in the Primary Sector Councils "Fit for a Better World" vision.
- This growth, e.g. through increase in horticulture and post-farm gate processing, can create significant additional value and jobs.

TRANSPORT AND LOGISTICS

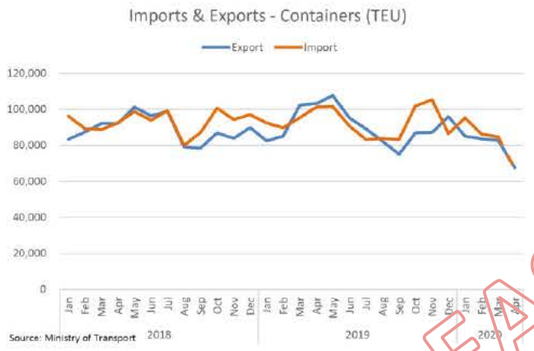
08/05/2020

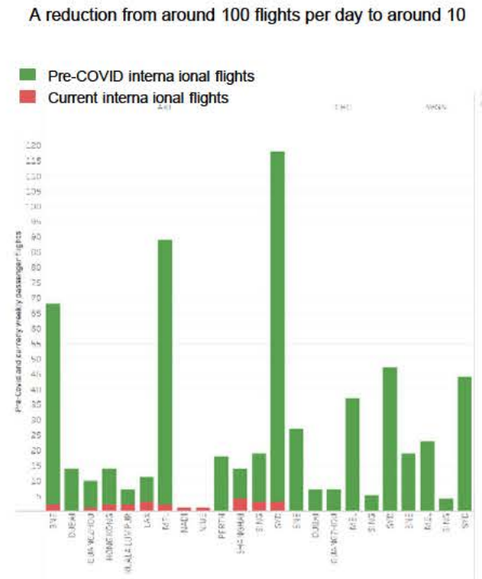
Industry profile

Description The transport and logistics sector is mostly engaged in providing transportation of passengers and freight by road, rail, water or air. It also includes activities such as postal services, warehousing and storage. As we have also prepared a Tourism sector profile, this profile is mainly focused on the movement of goods and freight rather than people.

Significance and Performance

- **The transport and logistics sector contributes 5 percent to GDP and employs 4.1 percent of the workforce**
- Transport and logistics is an important sector to New Zealand as it services most of our industries. The transport of goods is dependent on the rest of the economy, so any increase in domestic demand will increase the demand for transport.
- **Exports of transportation services was valued at $3.46 billion in 2019**
- There are 16,266 firms operating in this sector. 68 percent of them are sole traders (and 20 percent employ less than 5 people). Large firms employ 58 percent of workers (56,000).
- **Transport, postal and warehousing contributed 10.3% CO2-e emissions**. Transport also was a major contributor to the rise in household emissions due to road transport. Road transport emissions increased nearly 20 percent between 2007 and 2017. Environmental taxes on energy and transport have been increasing.





Contribution to GDP (%)	Number of firms	Employment share (%)	Maori workers in industry (%)	Pacific workers in industry (%)	Temporary visas (%)	Average weekly earnings ($)	R&D expenditure ($m)	Gross emissions (t CO2-e)
5%	16,266	4%	16%	9%	4.32%	$1,181	9	16590

Impacts of COVID-19

Current state

- **Transport networks** and services mostly operated well under Alert Level 4 in order to move essential goods around the country, albeit at slower speeds. Some congestion issues were reported at ports and storage yards but these were largely able to be resolved reasonably quickly. Alert Level 3 has seen growth in traffic volumes and more freight on the roads and we expect this to continue as restrictions are lifted and economic activity increases. A number of transport sector operators, including public transport and essential transport providers, are operating below cost of providing the service due to reduced demand.
- **Airfreight** capacity was constrained due to the significant reduction in international passenger flights. The Government made $330 million available to support maintaining airfreight capacity, to be allocated to a mix of services which most cost effectively deliver the Government's objectives. This created a market-led funding scheme that provides financial support to airlines and other aviation carriers to ensure capacity is provided on key routes. Negotiations have concluded with providers for additional services across 21 routes to 15 international destinations with 56 return flights per week. There will be many onward connections from those destinations as the aviation system globally operates a hub and spoke network.
- **Domestic land transport networks** continue to have spare capacity due to lower volumes. The move to Alert Level 3 has enabled export sectors such as coal, timber and pulp to reopen and begin using rail again. Truck volumes on the Cook Strait ferries have grown significantly since the move to Alert Level 3, with courier and livestock volumes particularly strong. Domestic rail volumes are now around 60 percent of pre-COVID-19 levels and volumes are increasing as supply chains reopen. Heavy vehicle traffic fell by 60 percent during the lockdown.
- **Seafreight**. In general the container supply chains throughout New Zealand appear to be stable and not under undue pressure. Log exports did stop but are now resuming and fuel imports ceased as storage facilities are full and fuel consumption dropped during lockdown. Container shipping lines do expect 'blank sailings' which reduce the frequency and overall capacity into the New Zealand market in line with demand. We don't believe that this will have a drastic impact on the total supply chain, but blank sailings may disrupt empty container availability at certain ports. We do not anticipate that scheduled shipping services will be withdrawn.

Key routes covered by the air freight capacity scheme

Red is Air New Zealand, **green** lines represent all other airlines. Other destinations shown represent potential growth options within the Air New Zealand agreement

Future outlook

- We have yet to see what, if any, medium-term impact there is on the international maritime freight system, which ultimately carries the bulk of our freight in and out of New Zealand. The reduction in international trade could significantly reduce capacity to and from New Zealand for the next few years. This an area that we will need to monitor, especially as the uncertainty is likely to impact on port investment decisions.
- Maintaining key aviation connections to international trade and tourism markets until borders open will be important so we do not lose position in market.
- With expected high unemployment rates, transport infrastructure investment across a range of modes could assist with the Government's stimulus package. Investment should be aligned with longer-term transport outcomes sought, including reducing emissions and creating liveable cities.
- We expect road freight movements to increase over the coming weeks and some upward movement in freight rates could be expected. COVID-19 and the lockdown has exposed the vulnerabilities of running 'just in time' logistics systems, and we may see businesses adapting their operations to carry more stock. With time likely to become a less important factor this may provide an opportunity for rail and coastal shipping to grow market share.

Key take outs

- Transport networks and services mostly operated well under the Alert Level 4 restrictions in order to movement essential goods around the country. Alert Level 3 has seen growth in traffic volumes and more freight on the roads. We expect freight volumes to continue growing as economic activity grows. This can already be detected on the road network.
- At Alert Level 2, there are no restrictions in travel across New Zealand including for recreation and tourism, but people must do it in a safe way.
- Our exit strategy from the air cargo programme relies on the market recovering or responding. This is most likely to arise if passenger volumes pick up (that will take a while), the market shifts to dedicated freighters, and/or market adapts to higher airfreight rates.

PROFESSIONAL SERVICES

01/05/2020

Industry profile

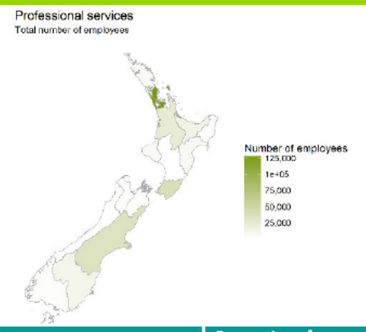
Professional services include a wide range of different types of services, including banking, financial services, insurance services, superannuation, scientific research, engineering, architecture, legal services and consultancy services.

Significance

- **Professional services is the fourth-largest industry by employment in New Zealand. Professional services are heavily concentrated in Auckland, Christchurch and Wellington**, are often high paying jobs, and largely serve the domestic economy.
- **7% of workers in professional services are Māori, and 4% are Pacific People**, reflecting a low participation of these groups in the professional service sector.
- Service industries excluding transport, postal and warehousing contribute around 2.1% of total CO2, growing on average 3.1% between 2007-17 (Stats NZ).

Performance

	Financial and insurance services	Professional scientific and technical services	Administrative and support services	Public administration and training	Other Services
Proportion of total GDP	6.0%	10.3%	2.1%	-	1.8%
Annual GDP growth	2.2%	0.6%	-1.4%	-	0.6%
Annual labour productivity growth	2.9%	-3.6%	0.1%	-	3.4%
Average labour productivity growth over cycle 2008-2019	1.8%	0.2%	-1.7%	-	0.6%
R&D spend as a proportion of industry GDP	0.4%	4.4%	0.4%	-	0.6%
Number of firms	37,758	62,433	18,984	1,230	24,570
Number of employees	58,400	167,100	115,400	141,700	75,500
Average hourly earnings 2019	$43.11	$36.70	-	$36.70	$26.97



Service sector	Proportion of workers Māori	Proportion of workers Pacific People
Public administration and training	15%	7%
Other services	26%	12%
Overall professional services	7%	4%

[1] Including Civil, Professional and Other Interest Group Services, Funeral, Crematorium and Cemetery Services, Machinery and Equipment Repair and Maintenance, Personal Care Services, Other Personal Services, Other Repair and Maintenance, Religious Services

Impacts of COVID-19

Current state and future outlook

Professional services remain in demand across the economy although some may become more discretionary as business look to reduce costs. However, as the industry is a large employer, even a moderate downturn could cause a large loss of jobs. 76% of services sector firms expect weaker economic conditions over the coming months[2]. With firms in the services sector pessimistic about the outlook for demand ahead, a **net 19% are looking to cut staff numbers.**

Architects, engineers, surveyors

Those professional services **exposed to the construction sector such as architects, engineers, and surveyors rely on a pipeline of work**, much of which has dried up as building and extension projects have been cancelled. The Construction Sector Accord between industry and government is shifting focus to rebuilding and improving the resiliency of the whole supply chain for the construction industry. This includes maintaining the pipeline of projects and cash flow in the sector.

Advertising and media services

Advertising has been badly hit by the lockdown and reduction in economic activity. Reduced advertising has affected media companies, with an estimated drop in advertising revenue of 50% to 75%.

Banking sector

Many parts of the **banking sector are essential services or have the capacity for online working**, and therefore continued to operate under Alert Level 4.

- Banks are reporting **significant rises in hardship applications and repayment holidays**. Most banks rolled out online applications for customers wishing to take advantage of the recently announce loan deferral package. Most of those applying for deferrals have received full deferment or a transfer to interest-only repayments.
- Banks have operationalised the Business Funding Guarantee Scheme.
- **Liquidity levels remain comfortable as deposit flows continue (supported by the wage subsidy scheme) whilst there is very low growth in lending**.
- **Extremely low interest rates will put increasing pressure on banks' margins**. Deposit funding has limits which are required to keep the flow of funds, meaning that banks will only be able to reduce the deposit rates up to a certain point.

Financial and insurance services

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, the overall strength and robustness of the financial system is much better than it was between 2006-2010 during the Global Financial Crisis.

All insurers reported **increased requests for hardship relief, and all major life insurers are offering premium suspension** (usually with suspension cover and no loss of benefits on resumption).

- The **reinsurance market is under some strain**, with reports that offshore insurers are reluctant to take on new agreed value income protection and redundancy benefit policies. There has also been a reduction in business for advisors, who rely on commission. Over the longer term, COVID-19 is likely to result in **increased costs for insurers, and therefore for insurance**.
- The impact on the insurance industry will be centred on valuation of investment portfolios as financial markets are highly volatile and stock markets have posted significant losses. New Zealand insurers typically have more fixed interest securities than international insurers, meaning that **reductions in interest income is a key risk for the sector**.
- **Many insurance products have exclusions for epidemics**, for example, business insurance and travel insurance. This will limit the exposure of insurers to losses. Health insurance claims are not expected to be an issue as the public health system is the main provider of healthcare for this type of disease. As unemployment rises, income and wealth protection products may start paying out more.

Key Take Outs

- The professional services sector is varied, and each sector will be facing its own challenges.
- Service sectors are often related to other industries, such as the construction and retail sectors, so will be dependent on the health of these sectors.
- The financial services sector is vital for the functioning of the economy and is likely to come under pressure as the New Zealand and international economies and financial markets continue to face significant headwinds.

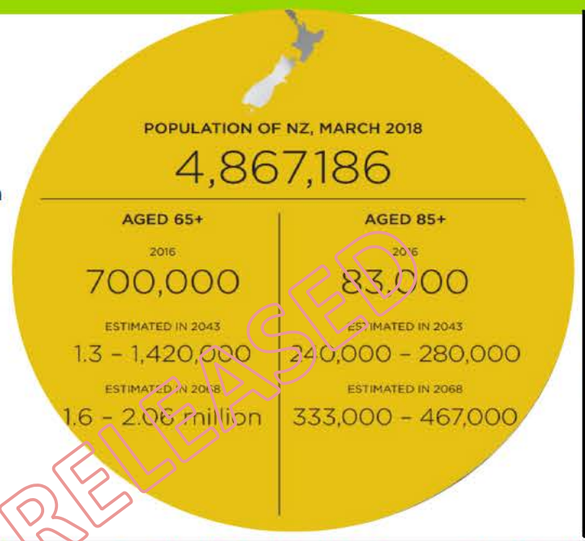
AGED CARE

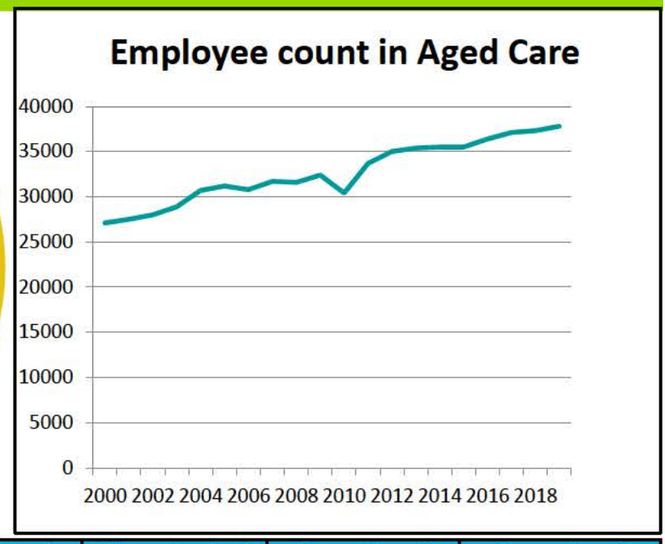
01/05/2020

Industry profile

Significance and Performance

- **New Zealand's population is ageing**: it is estimated that by 2036, 23% of the total population will be aged 65+ (compared to 14% in 2013. By 2051, the number of older people with a disability is expected to grow by 60%.
- **The market for aged care is around $3 billion, and grew by 3.6% between 2014-2019**.
- By 2026, demand for beds in aged care facilities is projected to be between 44,000 and 52,000 compared with 32,000 in 2010.
- Occupancy is 87.9% (as at 31 March 2018). There was a 1.9% increase in occupancy rate from 2017-18, arising from a 1.7% increase in residents and a 0.5% decrease in beds.
- As of 2019 **there are around 840 firms**. The number of firms has declined over time, suggesting there is some consolidation in the industry.
- The industry has a few very large firms such as Ryman Health Care , Oceania Healthcare and Bupa Care Services. The five largest firms account for 52% of total industry market share, and in 2019 these companies combined made approximately $603 million in profit after tax.
- The industry **employs approximately 37,800 people. Employment has increased significantly** (by over 10,000 employees) since 2000.
- Of the aged care workforce, caregivers accounted for the largest proportion (71%) , followed by registered nurses (16%).
- **Migrant workers are a large part of the aged care workforce**: 21% of staff directly employed by the New Zealand Aged Care Association are on a work visa.
- In 2017, the mean standard hourly wage rate across the industry ranged from $43.24 for facility managers, $28.17 for registered nurses, $20.87 for caregivers, and $16.40 for laundry staff.
- As of 2016, the proportion of Māori workers was 15% and 9% for Pacific people. **91% of employees in aged care are women**.
- The **workforce consists mostly of part-time workers**, working an average of 21 hours a week.





Number directly employed	Market size	Employment share	Number of firms in industry	Mean standard hourly rate (2017)	Proportion of workers Māori (%)	Proportion of workers Pacific People (%)
37,800	$3b	1.55%	840	$16.40-$43.24	15%	9%

Impacts of COVID-19

Current state

- Aged care as an essential service operated throughout Alert Level 4 .
- **The industry faced significant extra costs operating at this level, as they required extra staffing, cleaning, security, PPE and extra precautionary medical supplies** to prevent an outbreak from occurring and spreading. This cost the industry an estimated expense of $81 million up until the end of Alert Level 3. The **Government's COVID-19 relief fund has already provided $26 million to assist the industry with these costs**.
- As those in aged care are particularly vulnerable to COVID-19 and complications, the aged care industry was recommended to remain operating under Alert Level 4, with those over 70 recommended to not leave their facility other than for exercise. This resulted in **the industry facing increased costs under Alert Level 4.**
- **The sector has been suffering from staff shortages** due to workers over 70 and those with underlying health conditions standing down, and the loss of overseas workers not able to re-enter or enter New Zealand. Where staff have any slight illness, they cannot come to work. Some larger providers temporarily increased pay rates by $2 an hour so to retain sufficient workforce. Any shortage of preventative medical supplies, such as PPE and hand sanitiser, could also make preventative measures more difficult or more costly to implement.

Future outlook

- **Demand for aged care will continue to grow as New Zealand has an ageing population**.
- **Some providers were under significant financial pressure to the point of being financially unviable in pre-COVID-19 conditions**, and that situation will be exacerbated for them post COVID-19. In particular, this includes smaller providers and those in isolated rural areas.
- As older people are more vulnerable to COVID-19 and aged care facilities operate under ongoing restrictions, in the short term industry costs will remain higher for cleaning, staff, PPE and security to prevent or contain a COVID-19 outbreak throughout facilities.
- After accounting for the Government's subsidy, the industry must still absorb a cost increase of $55 million. This will continue to increase if there are more outbreaks and clusters throughout aged care facilities.
- Prior to COVID-19, there was an existing shortage of nurses globally, and many nurses in New Zealand are recruited from abroad. Nurses both from overseas and New Zealand are leaving aged care homes to work at District Health Boards due to better pay and conditions, creating a high number of vacancies for nurses in the aged care industry. Closed borders and inability to access migrant labour is exacerbating this shortage. In an environment where nurses are facing financial pressures in households, they are more likely to seek better pay and conditions.

Definition

Aged care industry operators include those who provide long-term residential care in rest homes, dementia units, psychogeriatric care units and long-stay hospitals for those over 65. Operators can also provide short-term residential care including respite care, carer support and Accident Compensation Corporation care.

Key Take Outs

- New Zealand's population is ageing. The demand for aged care industry is growing and is likely to continue growing.
- Due to COVID-19, the industry has faced significant costs for extra staffing, cleaning, security and PPE to prevent further outbreaks and clusters in residential care.
- The industry is facing staff shortages due to particularly strict sick leave procedures, low pay and conditions, employees with underlying health conditions, and loss of overseas workers.

EALTH TECHNOLOGIES

01/05/2020

Industry profile

Note: Health Technologies covers a broad range of technologies developed to contribute to human health, including medical devices, healthcare software and digital solutions, and pharmaceuticals. Because of the cross-cutting nature of the industry, it is not classified by Stats NZ which limits the amount of data we have available. The majority of data is taken from the New Zealand HealthTech Insights Report 2020, by the Technology Investment Network.

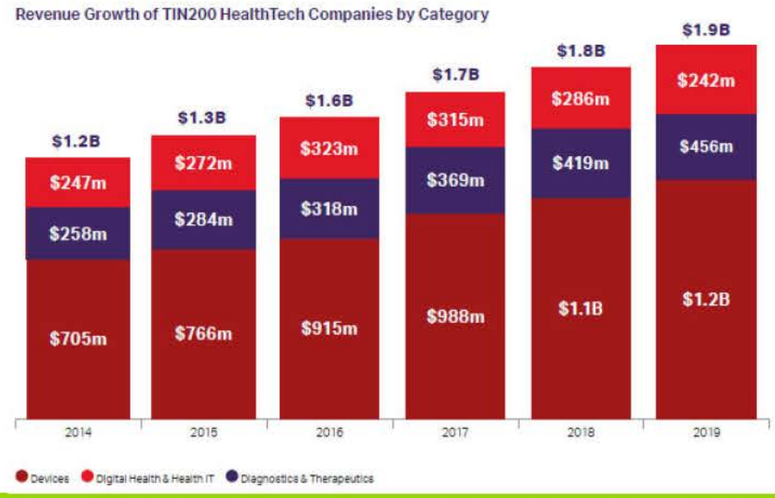
Significance

- Healthtech is still a relatively small part of the economy, but is a **high-performing sector**, with good growth potential.
- The sector is dominated by a small number of large players, notably Fisher & Paykel Healthcare ($1.07b 2019 revenue), Douglas Pharmaceuticals ($236m) and Orion Health ($117m), but also includes a number of other medium-sized firms, and early-stage companies.
- **Firms and Employment are largely concentrated in the main centres**, with more than half of identified firms located in Auckland, and 23% in Canterbury.
- Healthtech companies are **heavily export-oriented**, generating $1.6 billion in 2019 (87.5% of total revenues). North America (37.8%) is the largest market followed by Europe (23.7%).
- Healthtech is a sector of **strategic importance** to New Zealand, with domestic production ensuring that in times of crisis (such as the current pandemic) we have some degree of self-sufficiency in providing essential health products.

Number of firms (2019)	Number employed (2019)	Employment share (%)	Export share (%)	Average hourly earnings ($)	R&D expenditure ($m, 2019)
188	4300	0.19%	1.9	43.59	226m

Performance

- Revenue for the healthtech sector has grown rapidly, with a 5-year CAGR of 9.6%.
- The sector **invested $226 million in R&D in 2019,** 12.1% of revenue for the sector.
- Healthtech is a high-skilled, highly paid sector , with average hourly earnings 33% higher than the national average.
- **The sector is facing several skills shortages**, with the need to scale up staff and capabilities commonly being expressed, and in-depth understanding of technical, clinical and commercial environments required by employees.
- The level of investment into Healthtech is growing, but is still not enough to sustain the volume of innovation that is currently being generated by the sector.
- New Zealand has a well-respected health system, strong long-term data, and high-quality research .



Impacts of COVID-19

Current state

- Healthtech companies have been largely classified as essential businesses and as such have been **able to operate throughout the shutdown**. Callaghan Innovation Healthtech customers reported the lowest uptake of the wage subsidy out of all sectors.
- Certain **firms have experienced increased demand**, others increased success in securing DHB/MOH contracts and others have been able to pivot their operations to address COVID-19-related challenges. However this is not true across the whole sector, as many produce products or services in healthcare areas not directly linked to COVID-19.
- **The disruption of trade and logistics, including air freight and overseas lockdowns, has restricted the flow of key inputs into NZ manufacturing operations (including Healthtech)**, meaning firms must find alternative supply, often at increased cost, or potentially restrict or cease production.
- The response to COVID-19 has included the **acceleration of the National Health Information Platform,** a digital solution to patient records that will allow patient data to be shared in a secure, trusted way**.** It will be a key enabler for real-time clinical decision support, self-managed health, and data driven healthcare.
- Callaghan Innovation's **Healthtech customers were among the most optimistic** in the face of the COVID-19 situation, with 65% seeing opportunities, and only 11% unsettled.
- However the sector indicated high rates of **cash flow issues**, linked to the fact that health tech startups require a significant runway and heavy R&D before a return on investment can be generated. 87% of customers highlighted cash to support R&D as the most important form of support they could receive.

Future outlook

- **Healthtech will remain an essential sector** for ensuring the wellbeing of New Zealanders and ensuring self-sufficiency of crucial health products and PPE, but more opportunities exist for the sector to grow and deliver more from an economic and wellbeing perspective.
- The COVID-19 crisis is likely to place an **increased focus on health systems and health preparedness across the world**, as gaps in systems have been revealed and governments look to ensure they're well placed for a resurgence in COVID-19 or future pandemics. In particular, Covid-19 is driving radical transformation of the digital health sector as legislators and regulators are needing to adapt rapidly and technology is being proven. This includes areas like telehealth to enable remote consults, and digital solutions to improve efficiencies and save medical personnel time. This will lead to domestic and export opportunities for the New Zealand Healthtech sector.
- **Additional investment and start-up support is required** to commercialise our high-quality research into business opportunities for the country. Medical research often has larger costs and longer time frames, and traditional methods of commercialisation such as the Pre Seed Accelerator Fund have struggled to adequately meet its needs. This issue may be assisted by the increased focus on Healthtech, but a global recession will restrict available capital and reduces risk appetites among investors.
- This will be partly addressed by Canterbury's New Zealand Health Innovation Hub, the new tech incubator programme ,and the Healthtech Activator programme, a coordinated, ecosystem-wide support mechanism led by Callaghan Innovation that supports the commercialisation of HealthTech and growth of emerging New Zealand HealthTech companies.
- New Zealand's **pharmaceutical and medicinal chemistry sectors** in particular have been highlighted as **potential growth areas** should commercialisation and investment issues be addressed.
- **Clinical trials are an area of strong opportunity for high-value growth**. Our favourable regulatory environment, highly-regarded workforce and appetite for collaboration, combine with our strong performance in addressing the COVID-19 pandemic will place New Zealand in good standing as a destination for clinical trials, which provide not only high-value jobs but revenue for DHBs and hospitals, and involvement of experts in research and increased likelihood of developing new medicines and devices in New Zealand.
- There remains an ongoing **shortage of skilled staff** with an in-depth understanding of technical, clinical and commercial environments. International recruitment is likely a key source of niche skills, so the issue may be exacerbated by ongoing border restrictions.
- 61% of Callaghan Innovation healthtech customers expect to **increase long-term R&D spending**, likely indicating an expectation of future investment and demand for the sector.

Key Take Outs

- Healthtech is a high-value and high-performing sector with strong growth potential
- The industry has experienced disruptions due to COVID-19, but it has also driven demand for some firms, accelerated initiatives and research and will increase opportunities in the future.
- Increased investment and support for the sector will assist it in seizing these domestic and international opportunities, growing high-value employment and improving social outcomes.

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Some of the results in this paper are not official statistics. They have been created for research purposes from the Integrated Data Infrastructure (IDI), managed by Statistics New Zealand.
The opinions, findings, recommendations, and conclusions expressed in this paper are those of the author(s), not Statistics NZ or MBIE.

Access to the anonymised data used in this study was provided by Statistics NZ under the security and confidentiality provisions of the Statistics Act 1975. Only people authorised by the Statistics Act 1975 are allowed to see data about a particular person, household, business, or organisation, and the results in this paper have been confidentialised to protect these groups from identification and to keep their data safe.

Careful consideration has been given to the privacy, security, and confidentiality issues associated with using administrative and survey data in the IDI. Further detail can be found in the Privacy impact assessment for the Integrated Data Infrastructure available from www.stats.govt.nz.
The results are based in part on tax data supplied by Inland Revenue to Statistics NZ under the Tax Administration Act 1994. This tax data must be used only for statistical purposes, and no individual information may be published or disclosed in any other form, or provided to Inland Revenue for administrative or regulatory purposes.

Any person who has had access to the unit record data has certified that they have been shown, have read, and have understood section 81 of the Tax Administration Act 1994, which relates to secrecy. Any discussion of data limitations or weaknesses is in the context of using the IDI for statistical purposes, and is not related to the data's ability to support Inland Revenue's core operational requirements."