

Advanced manufacturing: Diversifying New Zealand's exports

Global growth rate

3.69%



NZ advantage score

8.7



Advanced manufacturing in New Zealand

This industry is a revelation in New Zealand. It has experienced significant growth in export earnings, rising from a total value of \$1.4 billion in 2012 to over \$6.9 billion today.⁶²

In particular, \$4.4 billion is from high-tech manufacturing and \$1.9 billion is from ICT.^{63,64} Advanced manufacturing is New Zealand's third biggest export revenue earner - currently 9.8% of total exports.^{65,66}

The industry showed a 239% increase in FDI in early stage technology companies in the past year.⁶⁷

Within New Zealand, MBIE includes both ICT and high-tech manufacturing within this industry.⁶⁸ MBIE defines advanced manufacturing as those industries where R&D across developed nations averages 8% or more of revenues.⁶⁹

Health technology is this industry's largest export sector, followed by generic pharmaceuticals and scientific technology.⁷⁰ The opportunities on our doorstep are limitless. Advanced manufacturing is a key contributor to the diversification of exports. In this industry, New Zealand's level of innovation, quality of products and services, and ease of doing business, outweigh the geographical disadvantage that it might otherwise face.

Opportunities

Figure 11 shows that New Zealand is in a good position to take full advantage of the opportunities within this industry given it is ranked 3rd in global creativity, 5th in Asia and Oceania for innovation and 6th in the world for contribution to science and technology.

Advanced manufacturing is critical for diversifying exports

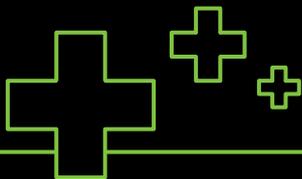
Advanced manufacturing is export intensive, with firms deriving most of their sales from exports. Advanced manufacturing is not only diversified in terms of products and services, but also in terms of geographical markets. For example:⁷¹

- Orion Health manages electronic patient information for over 25% of the United Kingdom's population, with a growing market presence in Spain and France
- Fisher & Paykel Healthcare generated significant revenue in Asia from sales of its medical devices
- Magic Memories is now the largest provider of innovative photography experiences, with 185 sites worldwide

New Zealand as a global leader within the advanced manufacturing industry

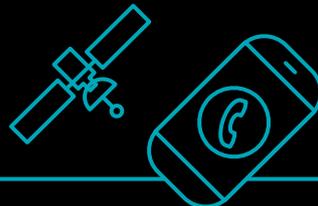
Health technology

- Designs and manufactures products and systems used in respiratory care, acute care and treatment of obstructive sleep apnea
- Develops and manufactures generic pharmaceuticals
- World leader in healthcare integration and precision medicine
- Developers of regenerative tissue substitute technology
- Develops bladder cancer detection technology
- Advanced image-processing techniques to detect breast cancer in women
- Medical devices specialising in wound care



Communications

- Delivers and manages communication solutions that support operation of utilities and public safety operations
- Develops and manufactures high performance quartz crystals components used for timing reference and frequency control in demanding applications, such as global positioning systems and wireless communications
- New Zealand makes the crystal oscillators inside smartphones
- Datacom: New Zealand's first IT company to reach \$1 billion in revenue in 2016 and now operates in 29 locations across the globe



Science and other



- Nuclear magnetic resonance technology
- Xero: one of the biggest small business ecosystems in the world, with more than 1 million subscribers
- World leader in airport baggage handling systems
- Technology solutions in the film industry
- New Zealand has 568 full time professional video game developers - more per capita than any country in the world⁷²
- Freeze-dried and ready-to-use liquid hemoglobin control products
- Building and operating of wirelessly controlled wall-climbing robots that perform high-precision tasks in high-risk environments
- Vista Group: a cluster of businesses providing technology solutions to the film industry; their flagship company Vista Cinema has software installed in over 80 countries and holds 38% global share of the Large Circuit Market (cinemas with 20+ screens)
- Buckley Systems: builds components for the machinery that produces 90% of the world's silicon chips
- Rocket Lab: develops lightweight, cost-effective commercial rocket launch services for small payloads such as CubeSats that require dedicated small launch vehicles and flexibility not currently offered by traditional rocket systems

Tech for agribusiness

- Designs and manufactures products and services for perimeter security, the weighing and electronic identification of farm animals, and electric fences on farms
- Gallagher Group: disruptive solutions for animal control, security and fuel systems
- Simcro: animal health pharmaceutical delivery systems
- NDA Group: high-tech engineering, manufacturing and servicing of industrial storage and process vessels for the dairy, food processing, chemical, gas and wine industries
- Haden and Custance: automated handling systems to handle and prepare bulk cheese and butter
- BioLumic: ultra violet (UV) light technology to improve crop yields for large crop and horticultural growers

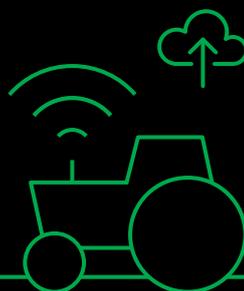


Figure 11: **New Zealand's strengths**



New Zealand excels in health technology

The design and manufacture of health technology is a great opportunity for New Zealand. We already have an international reputation for excellence in digital health and health technologies, and the need for health technologies to deliver improved outcomes is now greater than ever.

This is a direct consequence of ageing populations, the rise of chronic diseases and the expectation that the prevalence of dementia will double every twenty years. New Zealand has the opportunity to deliver the innovation needed to address these needs.

A shift towards services

Manufacturers are developing business models that integrate service offerings with products to create a competitive advantage. This is in line with the global shift towards service exports. Examples of such services are training, design, customisation, maintenance and software. This provides opportunities for New Zealand manufacturers to extend operations into the services market and increase their revenue base.

Big challenges to address

To take full advantage of the global opportunities in advanced manufacturing, New Zealand needs to be internationally connected through trade and investment, and the flow of people and ideas.

Maintain global connections

New Zealand currently has strong connections with the United States and Asian markets. But New Zealand must maintain and improve its strong connections to the world.

For example, New Zealand is participating in the Square Kilometre Array – a twelve-nation project to construct the world's largest radio telescope. New Zealand's contribution is to both the hardware (signals processing technology) and the software (designing algorithms needed to process more data than the whole internet carried in 2013) of this project.

Strive for foreign direct investment

In the past five years, a growing number of high profile and respected international investors have invested in New Zealand companies. As indicated previously, in the past year FDI increased by 239%. A future challenge is going to be maintaining this level of FDI.

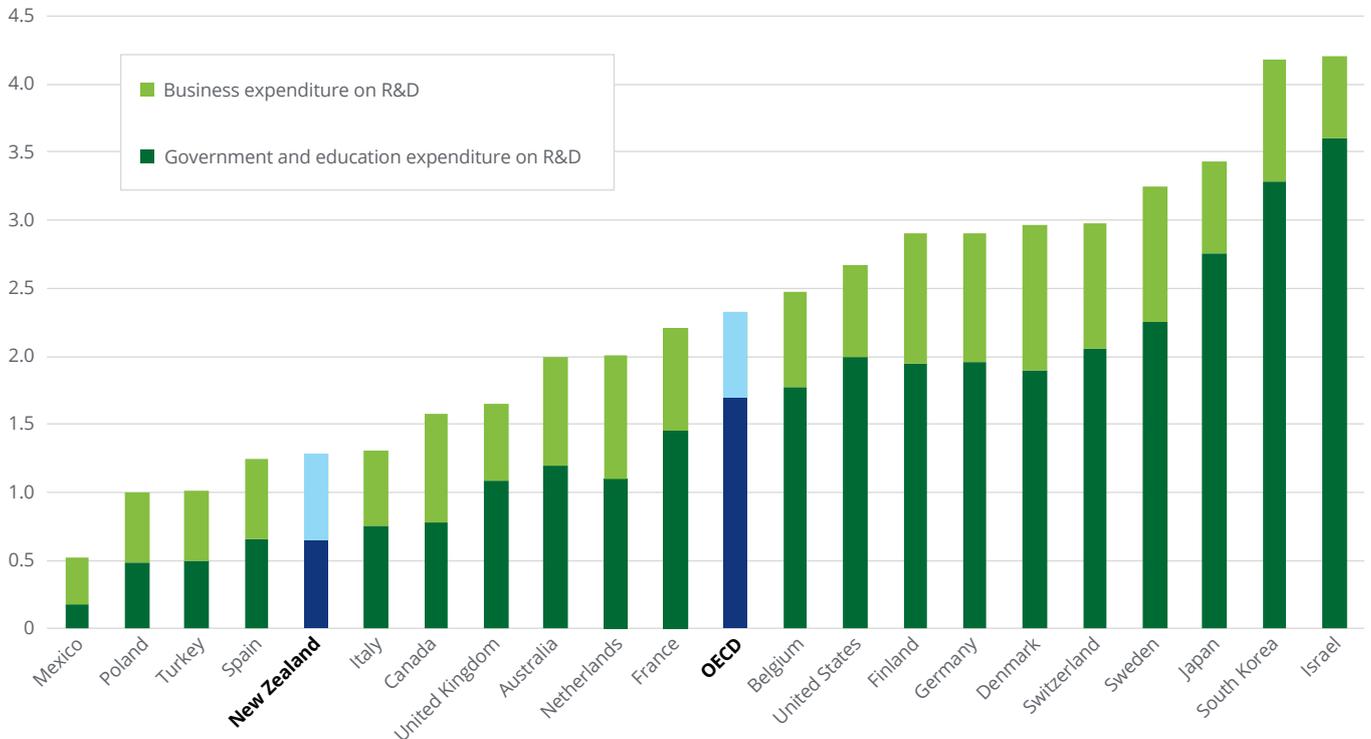
Address low investment in R&D

Expenditure on R&D is high in the advanced manufacturing industry. Yet currently, overall business expenditure on R&D in New Zealand is only 0.65% of GDP. The previous government set a target to increase this ratio to 1% of GDP by 2018, but it appears this will not be reached.⁷³ Private sector funding of R&D in New Zealand is one of the lowest in the OECD as shown in Figure 12. Being small is not an excuse. Other small advanced economies like Israel, Finland, Denmark and Sweden all spend between 2.0% to 3.5% of their GDP on R&D in terms of business expenditure, and these countries all have higher productivity than New Zealand.⁷⁴

A globally focussed industry

New Zealand firms in the advanced manufacturing industry need to be innovative and create international appeal from the start to get a first mover advantage on a global basis. Therefore, it is important to find ways to identify and pursue new markets in a timely manner and to attract talent to New Zealand.

Figure 12: **Expenditure on research and development** (percent of GDP 2017)



Source: OECD New Zealand economic survey, June 2017

Positioning for prosperity

Advanced manufacturing presents New Zealand with a crucial opportunity to diversify exports. The design and manufacture of health technologies is a key comparative advantage for New Zealand in this area.

The need for health technologies to deliver improved outcomes is now greater than ever, but there are barriers to overcome. In particular, the challenges include increasing expenditure on R&D and gaining first mover advantage on a global scale.

Businesses and government will need to take bold steps to realise the full opportunity that exists in this industry. If we do, advanced manufacturing will support greater diversification of exports and become one of the biggest drivers of prosperity in New Zealand.

1. How can we find ways to ensure we identify and pursue new markets in a timely way?
2. How can we increase expenditure on R&D in New Zealand, particularly private sector expenditure?
3. How can we increase government funding on health research?
4. How can we create pockets of excellence across New Zealand, particularly in research?