

Information and Communications Technology





**MINISTRY OF BUSINESS,
INNOVATION & EMPLOYMENT**
HIKINA WHAKATUTUKI

MBIE develops and delivers policy, services, advice and regulation to support economic growth and the prosperity and wellbeing of New Zealanders.

MBIE combines the former Ministries of Economic Development, Science + Innovation, and the Departments of Labour and Building and Housing.

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New Zealand Sectors Report 2013

The New Zealand Sectors Report consists of the Main Report covering all sectors in the economy and six additional, separate, reports providing an in-depth analysis of six individual sectors. The seven reports are:

- 1 **The New Zealand Sectors Report 2013: Main Report**

Featured Sector Reports:

- 2 **Information and communications technology (ICT)
(this report)**

- 3 **High technology manufacturing**

- 4 **Construction**

- 5 **Petroleum and minerals**

- 6 **Tourism**

- 7 **Knowledge intensive services**



Minister's foreword

I am pleased to present this report on the fast-growing, high-achieving ICT sector and its impact on jobs, skills, innovation and growth.

New Zealand's traditional economy, exports and markets are changing, and the pace of change is accelerating.

Our traditional export sectors, such as food and beverage, forestry and tourism, remain important components of the economy. Increasingly we are also seeing growth in emerging export sectors such as information technology (IT) services (averaging 11 per cent per annum since 2002), high-technology manufacturing and processed foods.

IT services in particular are generating significant innovation, attracting investment in established firms and start-ups, and creating wealth and high-skilled employment opportunities for New Zealanders.

The report focuses mainly on the IT services sector formally called 'computer system design and related services'. The number of firms in computer system design has grown by more than 3,300 since 2002. The sector is investing strongly in research and development - up 18.9 per cent since 2011. Exports of computer and information services have increased by 85 per cent since 2006 with Australia and North America being key markets. Wages and salaries in computer system design are twice the New Zealand average and are growing faster than the average.

Digital technologies and automation are also driving significant change across the whole economy. Traditional exports are increasingly enabled by digital technology or have a software component. A total of 62,252 workers were employed in ICT related

occupations across the whole economy in 2012, from the financial and insurance sector to manufacturing and agriculture. This is an increase of 11,184 workers since 2003.

Many of the initiatives the Government is implementing through its Business Growth Agenda are targeted towards the future growth of this sector – such as encouraging business innovation through Callaghan Innovation, rolling out Ultra-Fast Broadband fibre to 75 per cent of New Zealand households, and increasing access to capital for small, high-growth businesses through the New Zealand Venture Investment Fund.

One of the main challenges facing the sector is the international shortage of highly skilled IT professionals. Around half of computer system design firms report moderate or severe difficulty in recruiting managers and professionals, and more than half report moderate or severe difficulty in recruiting technicians and associated professionals. The government is working alongside industry to encourage more students to train as IT professionals.

For New Zealand to grow incomes and jobs, we need all sectors of our economy to operate successfully. The information in this report will help investors, business and policy makers to remove constraints so we can further develop New Zealand's high performing ICT sector.

Hon Steven Joyce

MINISTER FOR ECONOMIC DEVELOPMENT
MINISTER FOR SCIENCE AND INNOVATION
MINISTER FOR TERTIARY EDUCATION, SKILLS AND EMPLOYMENT
ASSOCIATE MINISTER OF FINANCE

Key terms and data limitations

Defining sectors

A sector is an area of economic activity in which businesses or other organisations (e.g. government or voluntary organisations) share a similar market or produce a similar product or service. Examples are retailing (businesses that sell products directly to consumers) and telecommunications (provision of communications services using wired or wireless infrastructure).

This report uses data grouped into sectors using the Australian and New Zealand Industrial Classification codes (ANZSIC codes). A business or other type of organisation is classified to an ANZSIC code based on its predominant activity. The term 'sector' is often used interchangeably with the term 'industry'.

Sources

The numbers in this report come from multiple sources. Data sourced from Statistics New Zealand is the latest that was available as at mid-December 2012. Some of this data is provisional and may change.

The data used covers different time periods for different metrics. For example, goods exports is for the year ended June 2012, while labour productivity is for the year ended March 2010.

Customised data for ICT

ICT is a cross-cutting sector combining several ANZSIC codes. Customised data has been provided by Statistics New Zealand for this report.

Export data

Some export data for cross-cutting sectors uses international sources in order to provide a longer time series. These sources may not

agree with Statistics New Zealand data due to differences in the group of exported products being allocated to the relevant sector.

Use of the term 'firm'

The term 'firm' is used generically. It includes all relevant entities, some of which are not firms at all, such as those in the charities, government, education and health sectors.

Example firms

This report provides examples of firms which are believed to belong to the sector. The example firms provide a partial answer to a key question on the composition of a sector: which firms are in it?

Firms are classified by Statistics New Zealand as being part of an industry sector according to their predominant activity. This is explained fully on the Statistics New Zealand website. The classification of each firm to a sector using the Australian and New Zealand Standard Industrial Classification (ANZSIC) system is **confidential** to Statistics New Zealand.

Because of the confidentiality rules, MBIE has used other publicly available sources to determine which firms are likely to belong to a sector. These sources may be inaccurate or incomplete.

Quotes and interviews

A limited number of interviews with sector leaders were carried out in the preparation of this report. Anonymous quotes from these interviews that illustrate key themes have been included. The opinions expressed are those of the industry participants. Additional quotes from public sources have also been used.

A full explanation of the data sources and limitations is provided in the Appendix.

Report objective

The New Zealand Sectors Report Series is a set of seven publications that provides a factual source of information in an accessible format on the key sectors that make up the New Zealand economy.

New Zealand needs to encourage all industry sectors to operate at their peak potential to meet the goals of our Business Growth Agenda. This report provides information on New Zealand's ICT sector, with a special focus on IT services.

The report does not intend to draw policy conclusions. Its aim is to provide a comprehensive report card on the state of New Zealand's ICT Sector for business people, exporters, policy makers, media commentators, economists, academics, students and anyone with an interest in New Zealand's economic development.

The Ministry of Business, Innovation & Employment (MBIE) welcomes comment and feedback on this report, and on the measures the Government is taking to facilitate the development of a competitive and successful ICT sector. Email sectors.reports@mbie.govt.nz



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Executive summary

General

- Information and communications technology (ICT) captures three important activities in the economy: ICT manufacturing, telecommunications and information technology (IT) services. This report provides a snapshot of the aggregated data for these activities. Collectively they contribute 5 per cent of GDP and employ 73,392 New Zealanders; 3.2 per cent of the workforce.
- The report finds major differences in the structure and characteristics of the three industries captured by the definition for ICT. The bulk of the report focuses on IT services.

ICT manufacturing

- ICT manufacturing is a small sub-set of high technology manufacturing and so is not considered in detail in this report. Data on ICT manufacturing is captured in the High Technology Manufacturing Report.*

Telecommunications

- The telecommunications industry provides the communications – or the 'C' component of ICT. This is a critical part of the enabling infrastructure underpinning the digital economy.
- New Zealand has well-developed telecommunications infrastructure. The Government is working with the sector through the Ultra-Fast Broadband (UFB) and Rural Broadband Initiative (RBI) programmes to improve Internet access and speed for all New Zealanders.
- The telecommunications sector is domestically focused, and is not a significant contributor to exports.
- Telecommunications businesses globally and in New Zealand are having to develop new business models to meet the increasing demand for high speed data, particularly with the rapid

adoption of smartphones and other mobile devices. At the same time revenues from traditional fixed-line telephony services are declining.

IT services and product firms

- Of the three industries covered, IT services is found to be generating significant innovation, attracting investment in established and start-up businesses, and generating export and employment growth and value creation.
- For this reason, the bulk of the report focuses on the largest IT services sub-sector, which has the formal name of 'computer system design and related services' (ANZSIC** code M7000).
- The report finds that IT businesses can be divided into two broad types: those delivering IT services and those developing IT products.
- IT services firms are mainly focused on the domestic market, providing IT infrastructure to medium and large organisations. This group includes many multi-nationals. They are important to the New Zealand economy, enabling large corporates and organisations (such as government departments) to drive efficiencies and develop new products, services or forms of service delivery through the application of ICT. They are critical to driving the digitisation of the economy.
- On the other hand, IT product firms are focused on developing new applications and web-services typically aimed at a particular industry or process. These firms are highly innovative and research and development (R&D) intensive. They have the potential to be significant exporters and build large international businesses.

In many cases these firms are developing products based around cloud computing and the software as a service model.

Executive summary continued

Business and employment

- The computer system design sub-sector has shown strong employment growth, adding 1,630 jobs in 2012 across a range of occupation types.
- The number of firms in the sector has grown by 40 per cent since 2002, with an additional 266 firms in total, 142 of which are mid-sized (10–49 employees).
- Half of all employees in the sub-sector are in Auckland, a quarter in Wellington, with Christchurch accounting for 10 per cent.
- By far the majority of jobs are professional and technical, with wages and salaries twice the New Zealand average. Firms in the sector report increasing difficulty in recruiting skilled staff.

Expansion and R&D

- Close to half of the firms in the sector invested in expansion in 2012, almost twice the New Zealand average, and a third undertook R&D, four times the New Zealand average. Firms undertaking R&D invested on average \$1.1 million in R&D activities in 2012.

Exports

- Exports of computer and information services showed a compound annual growth rate (CAGR) of 11% in the period 2006 – 2012, 3% higher than the growth in computer and information services imports. If this trend continues New Zealand will become a net-exporter of computer services in the next few years.
- Australia and North America are the major markets and have driven growth. Exporters report access to finance and distance as barriers, but also report fewer concerns about the exchange rate than for New Zealand exporters generally.

Investment

- The sector is attracting increased investment from angel and venture investors, and there is a small but growing number of firms listing on the sharemarket.

The Digital Economy

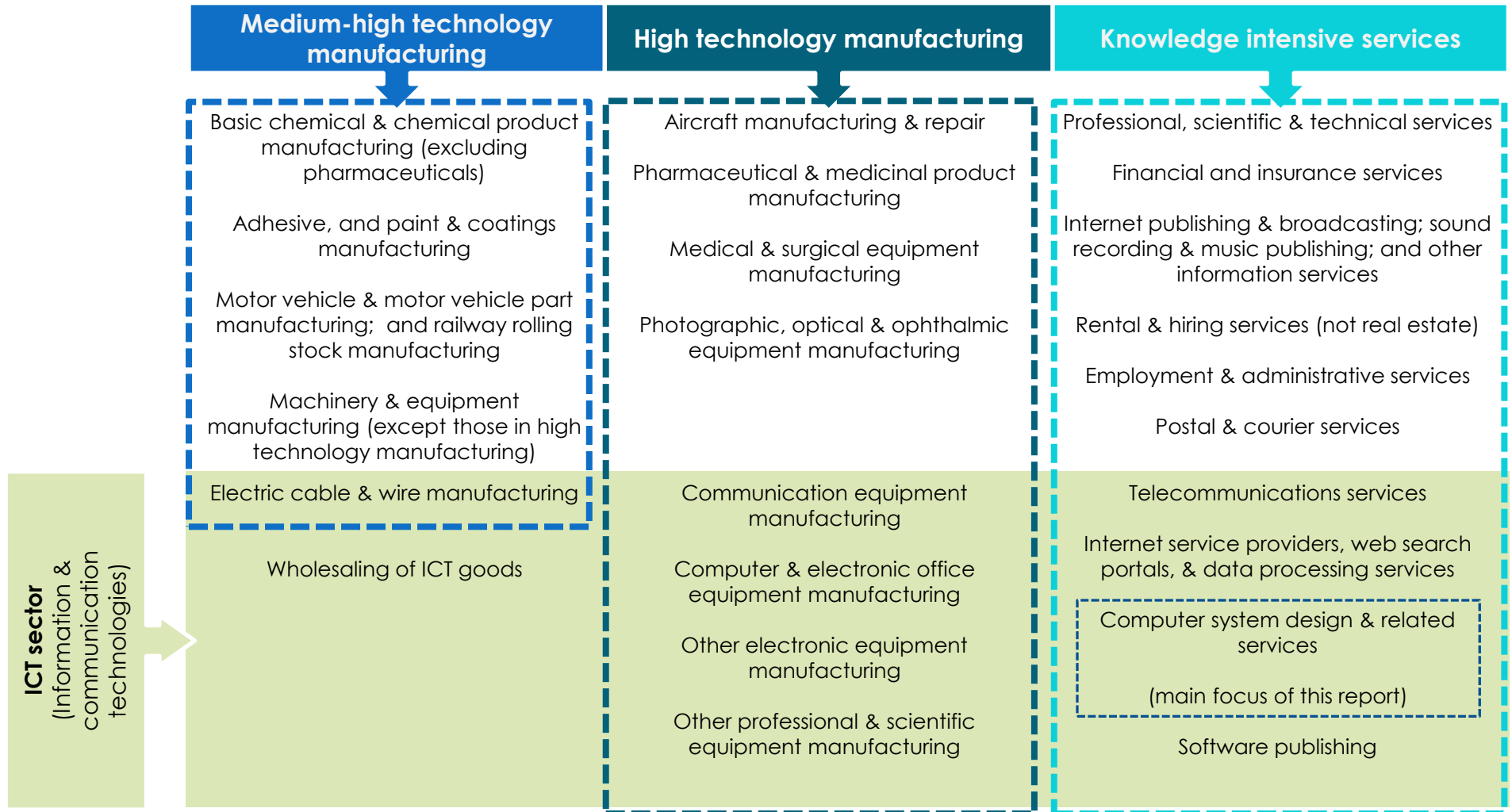
- Sixty two thousand workers were employed in ICT occupations (as distinct from being employed by ICT firms) across the whole economy in 2012, 11,000 more than in 2003.
- The report finds that information technology is increasingly pervasive across all economic and social activities, and is driving significant and sometimes fundamental change in most sectors of the economy.
- The implication is that some traditional occupations and industries will disappear or change radically (as has occurred with the music industry), while new opportunities for value creation and economic growth emerge.
- Firms which may be formally classified as being in the IT sector often see themselves as being part of the sector they serve. For instance, Konnect Net sees itself as part of the insurance industry, although the service it provides is entirely ICT enabled.



DEFINITION AND KEY THEMES

OECD definition for ICT*

The ICT sector includes activities which are also classified as part of high technology manufacturing and knowledge intensive services



*The full definition of the ICT sector, including Australia and New Zealand Industrial Classification (ANZSIC) codes, is provided in the Appendix

Key themes: New Zealand industry

A number of key themes emerged in the ICT sector

Theme	Description	Details
'Weightless' exports	The export of intellectual property and ideas. In the context of ICT, typically software applications or services that utilise ICT platforms, such as software as a service.	<ul style="list-style-type: none"> • Examples include Orion Healthcare, Xero and Green Button. • Weightless exports are not costless. While the product or service is weightless in the sense of being computer code, there is significant cost in sales and marketing, after-sales service, customisation and installation – much of this cannot be done remotely and requires a presence in-market.
Increased investment	ICT sector attracting increasing interest from angel and venture investors and on the NZX.	<ul style="list-style-type: none"> • In 2011, two-thirds of venture and early stage investments were in IT or software companies. • The initial capital requirements for a software-as-a-service business are significantly less than for high technology manufacturing. Most of the cost is in people. Once the business is proven, however, the capital requirements to scale quickly and build an international network for sales, marketing and customer support are significant.
Demand for skills	Increased use of ICT across the economy generating employment growth across a range of skill-sets, including software engineering and development, project managers, marketers, sales, administrators and business analysts.	<ul style="list-style-type: none"> • <i>When you go to the knowledge intensive side, you create employment here and that plays to our natural advantages – our geography, our good schooling system and our quality of life.</i> – Director, technology company. • <i>The best guesstimate is that we will need twice as many people working in the technology industry – broadly defined – as we have today. The biggest bottleneck is the scarcity of people.</i> – CEO, industry body.
Innovation	Information and communications technologies providing platform for innovation across all sectors.	<ul style="list-style-type: none"> • The ICT sector produces twice as many innovations that are 'new to the world' than the New Zealand average. • <i>I see in the ICT sector some stunningly good ideas and guys that can build services and sometimes products on a shoestring</i> – Director, technology company.
Mobile connectivity	Rapid uptake of smartphones, tablet computers and other mobile devices.	<ul style="list-style-type: none"> • Mobile broadband users increased by 34% in the June 2012 year to 2.5 million, more than half the population. • Vodafone has launched a 4G network with data speeds up to 10 times that of 3G.
Developing capabilities	New Zealand companies gaining experience and building local and international business networks in support of export growth.	<ul style="list-style-type: none"> • Kiwi Landing Pad established in San Francisco with support from private investors and government. • <i>Kiwi Landing Pad looking good and Kiwi businesses doing the business in San Francisco...</i> pic.twitter.com/zpjKhEnbum – Sam Morgan tweet, March 2013. • <i>We always knew that New Zealand companies had good products, but they just didn't know how to get in. Now there's a little ecosystem starting to develop especially in San Francisco and Washington DC.</i> – CEO, industry body.

Key themes: technology

The pace of technological change is increasing, driving change in all sectors

Theme	Description	Details
Cloud computing	Cloud computing is the use of computing resources (hardware and software) that are delivered as a service over the Internet. This enables data and software applications on remote servers to be accessed on any computer or device, anywhere, anytime.	<ul style="list-style-type: none">• Enables individuals and businesses to have access to highly sophisticated computing resources, data or applications at low cost.• Provides a platform for different business models, e.g. software as a service (Xero's accounting services, Diligent Board Member Services' Board Portal)• A familiar example is the music service Spotify, which provides individuals access to a vast database of recorded music that can be streamed to many devices.
Cyber security / privacy	Big data enabling governments and businesses to analyse and track individual behaviour. Ubiquitous use of electronic technology for all activities and functions increases vulnerability to cyber attacks and security breaches.	<ul style="list-style-type: none">• In 2012, 8% of firms reported a security attack that resulted in the loss of data or time, or damage to software – Statistics NZ, Business Operations Survey, 2012• <i>...companies ranging from IBM to Google to Microsoft are racing to combine natural language processing with huge Big Data systems in the cloud that we can access from anywhere. These systems will know us better than our best friend.</i> – Greg Satell, Forbes.com, 13 March, 2013.
Internet of things / remote sensing	Increasing numbers of objects are embedded with sensors and gaining the ability to communicate. The resulting information networks contribute to big data and highly customised applications and management.	<ul style="list-style-type: none">• MetService has access to over 2000 Automatic Weather Stations in New Zealand which make approximately one billion observations per year. Over half of these stations are in rural areas. MetService collects many gigabytes of data each day. In 2014–15 the new Japanese weather satellites Himawari 8 and 9 will each deliver one terabyte of data per day.• Proposal to make Christchurch a 'sensing city' streaming real-time information on everything from traffic to weather and water systems, and even how many people are on the city's streets. – media report; stuff.co.nz., April 2013.
Big data	Datasets too large to be manipulated by ordinary database programmes. This data comes from everywhere: sensors used to gather climate information, posts to social media sites, digital pictures and videos, purchase transaction records (credit cards, loyalty cards) and cell phone GPS signals and applications.	<ul style="list-style-type: none">• <i>The use of big data will become a key basis of competition and growth for individual firms... The use of big data will underpin new waves of productivity growth and consumer surplus.</i> – McKinsey Global Institute.



THE GOVERNMENT'S BUSINESS GROWTH AGENDA



The Government's Business Growth Agenda

Actions to support ICT innovation

Encouraging business innovation

- The establishment of Callaghan Innovation to encourage business innovation in high-value manufacturing, including ICT manufacturing.
- Use expanded Tech NZ co-funding to encourage business innovation.
- Increase the proportion of total public innovation investment dedicated to firm-led innovation.
- Identify and implement improvements to incubator settings, including examining international models.
- Maximise the competitiveness of the New Zealand business environment to encourage innovation.
- Investigate whether tax treatment of R&D is discouraging firm R&D.
- Simplify and modernise government procurement policy to encourage innovation and firm participation.
- Continue to increase annual public science and innovation funding towards 0.8% of GDP as fiscal conditions allow.

Developing innovation infrastructure

- Roll-out Ultra-Fast Broadband through fibre to 75% of New Zealanders by end of 2019.
- Roll-out the Rural Broadband Initiative to deliver high quality broadband and increase connectivity.
- Facilitate broadband uptake through e-education, e-health, e-business, e-development.
- Manage the digital switchover and next generation mobile services.
- Implement a cyber-security strategy, establish a National Cyber Security Centre to protect against cyber threats, and raise awareness of cyber security issues.
- Investigate and encourage the development of Innovation Parks.
- Regulate mobile termination rates to improve competition.
- Accelerate digital television switch over to enable higher value use of 700 MHz spectrum (4G spectrum) for ICT purposes.



The Government's Business Growth Agenda

Actions to improve skills availability and intellectual property settings

Growing the innovation workforce

- Increase investment in engineering studies at tertiary institutions and lift graduate numbers by 500 per annum by 2017.
- Collect and provide better information on career prospects to students and the tertiary sector.
- Highlight the role of entrepreneurship in business innovation through annual Prime Minister's Business Scholarships.
- Investigate highlighting innovation careers in science, design, engineering and maths to school students and their families.
- Establish annual Prime Minister's Science Prizes to acknowledge and reward scientific achievement.
- Maintain internationally competitive personal tax rates that encourage highly-skilled workers to work from New Zealand.

Strengthening tertiary education

- Purchase additional tertiary places as required to meet demand across the sector, including in engineering.
- Complete the introduction of performance-linked funding to focus providers on achieving results for students.
- Publish employment outcome information and likely industry demand indicators, to better inform prospective students about study choices.
- Review the Essential Skills in Demand lists, to examine their effectiveness in addressing skills shortages in the short- and long-term.

Improving intellectual property settings

- Complete passage of the Patents Bill to more closely align New Zealand's patent settings with trading partners.
- Create a single trans-Tasman patents examination regime with Australia to simplify patent applications.
- Investigate whether the intellectual property settings of public institutions are optimal for technology transfer.
- Explore opportunities for government to improve the environment for firms' use of intellectual property.



The Government's Business Growth Agenda

Actions to support exporters and businesses looking to expand internationally

Strengthening high-value manufacturing and services exports

- With Callaghan Innovation, and through New Zealand Trade and Enterprise (NZTE) programmes Better by Design, Better by Lean, Better by Strategy and through the Primary Growth Partnership, assist firms to grow international capability, e.g through improving supply chain integration using digital technology. (Farm IQ is a Primary Growth Partnership example).
- Establish mechanisms to secure commercial export opportunities on the basis of core public sector intellectual property and expertise.
- Develop stronger 'NZ Inc' approach with business on cyber security.
- Identify key issues for commercial service exporters and promote export prospects.

Making it easier to trade from New Zealand

- Establish a single trade window for importers and exporters.
- Enhance the NZ Export Credit Office products and services, improving guarantee products to support export growth.
- Implement Immigration Global Management System upgrade and network configuration.
- Undertake 28 Minister-led trade missions over the parliamentary terms to unlock strategic opportunities for business.

Helping businesses internationalise

- Deliver targeted services to approximately 2000 internationalising firms, with an intensive focus on 500 firms. Of the current 500, 80 are ICT firms. Examples of services include NZTE programmes such as Beachheads, Path to Market and Better by Capital.
- Deliver multi-firm, high impact market development programmes to accelerate the success of firms in the Health IT and Security Technology sectors.
- Use the International Growth Fund (IGF) to assist high growth firms to internationalise.
- Utilise the Better by Capital service to assist high growth firms to plan for, and attract the growth capital required to achieve their international growth plans.
- Deliver integrated knowledge on key markets to business from all agencies operating off-shore.
- Develop with key stakeholders a broad, compelling, and flexible New Zealand story that works for a range of exporters and sectors, including tourism and education, and for immigration .



The Government's Business Growth Agenda

Actions to improve investment and access to capital

Strengthening equity markets

- Partially-list four State-owned enterprises on the NZX exchange.
- Investigate options for lower cost public listing.
- Pass the Financial Markets Conduct Bill to make it easier for listed companies to raise capital.
- Make it easier for businesses to offer employee share schemes.
- Pass the Financial Reporting Bill to reduce unnecessary financial reporting costs for business.

Supporting early stage and growth capital

- Increase access to capital for small, high-growth businesses by supporting the New Zealand Venture Investment Fund.
- Deliver targeted services to help internationalising New Zealand firms raise capital.
- Improvements to business R&D grants.
- Improvements to incubator programmes.
- Enable crowd funding and peer-to-peer lending.
- Provide more options for SMEs to raise capital by clarifying and widening disclosure exceptions for SMEs seeking to raise capital (e.g. offers to experienced investors, small offers).

Attracting foreign investment

- Encourage a more positive environment for international investment and explain the benefits to New Zealanders.
- Align business law between New Zealand and Australia.
- Review investor, entrepreneur and worker policy settings with a view to attracting migrants with the right skills and capital to invest.

Attracting skilled migrants and investors

- Review investor, entrepreneur and worker policy settings with a view to attracting migrants with the right skills and capital to invest.
- Introduce Silver Fern Visa to provide employers with greater access to young skilled migrants.



ICT SECTOR SNAPSHOT AND INDUSTRY CHARACTERISTICS

ICT snapshot (OECD definition)

Situation

Cross-cutting sector (data is aggregated and double-counted with other sectors)

Includes firms whose main activity is provision of goods and services which fulfil or enable the function of information processing and communication by electronic means including transmission and display. Also includes firms which provide goods which use electronic processing to detect, measure and/or record physical phenomena or control a physical process.

Scorecard						Example firms			
Measure	Total	% of NZ*	Growth (1 year)	Growth (5 yr CAGR)	Growth (10 yr CAGR)	Firm	Turnover (\$m)	Employees	Ownership
GDP 2010 (nominal)	\$8,405m	5.1%	-4.6%	2.8%	n/a	Chorus	\$613m (7 months ending June 2012)	548	Listed NZX
Real GDP 2012	n/a	n/a	n/a	n/a	n/a	Telecom	4,576m (2012)	7,866 (2012)	Listed NZX
Goods exports 2012	\$745m	1.7%	11.4%	-1.0%	n/a	Revera	\$38 (2012)	133	Acquired by Telecom
Employment 2011	73,398	3.2%	2.0%	1.1%	1.8%	Orion Health	\$100 (2012)	633	Private
Value added / employee 2010 (nominal)**	\$116,832	161.4%**	0.2%	1.1%	n/d	Optimization (NZ)	\$48 (2012)	230	Private
Investment in fixed assets 2010	\$1,278m	4.2%	-17.0%	n/d	n/d				
No. of firms 2012	14,187	3.0%	1.4%	0.8%	3.2%				

Industry level financial performance				
	Total		Growth (1yr)	
	This sector	All sectors	This sector	All sectors
Total income per firm 2011 [#]	\$1,923,412	\$1,294,500	5.6%	5.2%
Total income per employee 2011 [#]	\$453,027	\$311,600	7.0%	4.0%
Surplus per employee 2011 [#]	\$17,199	\$24,000	-15.8%	-12.7%
Return on equity 2011 [#]	9.8%	6.6%	down	down
Debt ratio (liabilities/assets) 2011 [#]	65.7%	64.1%	up	down
Capital stock per worker 2010	n/a	\$169,364	n/a	5.2%

* NZ is total employing firms, except total measured sector for productivity

** Cross-cutting sector: uses value add per employee for productivity, NZ average = 100%

[#]All sector total excludes some industries. Refer appendix, terms and definitions.

Key services exports from this sector		Key markets for this sector	
Service (aggregated ICT data)	Exports (\$m; 2012)	Country	Exports (\$m; 2012)
Computer services	\$391.3	n/a	
Communication services	\$183.6		
Software royalties	\$123.2		
News & information services	\$21.5		
Other royalties & franchises	\$15.5		
Other	\$383.9	Other	
TOTAL all exports	\$1,119	TOTAL all countries	\$1,119

ICT snapshot (OECD definition)

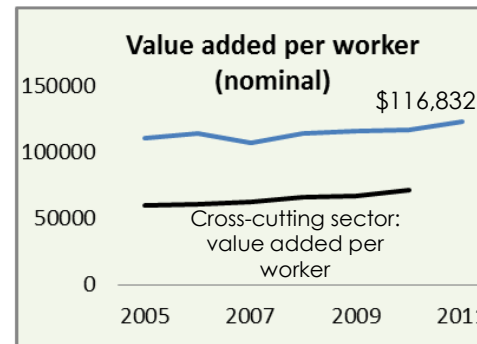
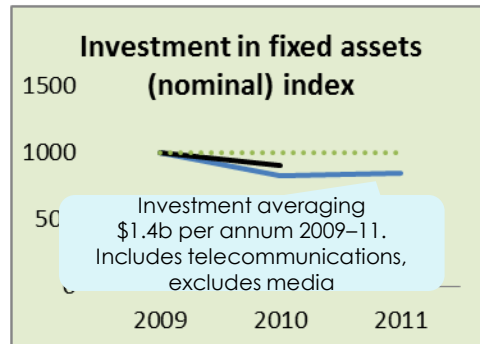
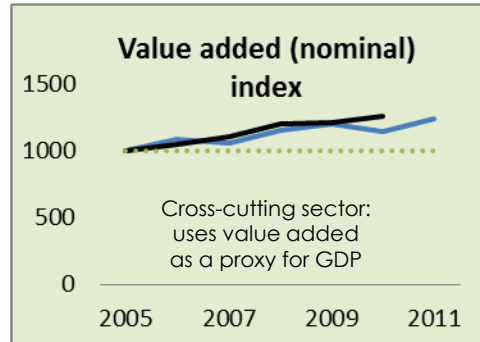
Performance

Cross-cutting sector (data is aggregated and double-counted with other sectors)

Key trends, various timeframes: 10-year index (base =1000) except productivity is \$ values – this sector vs all other sectors

Comment

- Sector value add growing
- Large employer: 73,398
- More workers overall: +11,754 (2001–11)
- Lost workers: -3,627 (2009)
- More workers: +1455 (2011)
- Productivity improving
- Goods exports recovering after GFC
- Services exports growing
- Number of firms increasing
- Fixed capital investment stable
- R&D and innovation rates high
- Return on investment: 10% (2011)
- Highly internationalised sector



Key

- ICT
- Other employing sectors
- ⋯ Starting point = 1000
- - - Measured sector

Results from Survey: 2011 R&D & innovation rates		Export barriers: Current exporters	% firms	Export barriers: Future exporters	% firms	Internationalisation	%
R&D rate		1. Distance from markets		1. Limited experience in expanding beyond NZ		% of ICT firms reporting overseas income	n/a
Innovation rate		2. Other		2. Limited access to finance for expansion beyond NZ		% of ICT firms with off-shore direct investment	11%
		3. Exchange rate volatility/ Limited access to finance for expansion beyond NZ		3. Limited knowledge about specific markets/ Low market demand or increased competition		% of ICT firms >50% foreign owned	19%

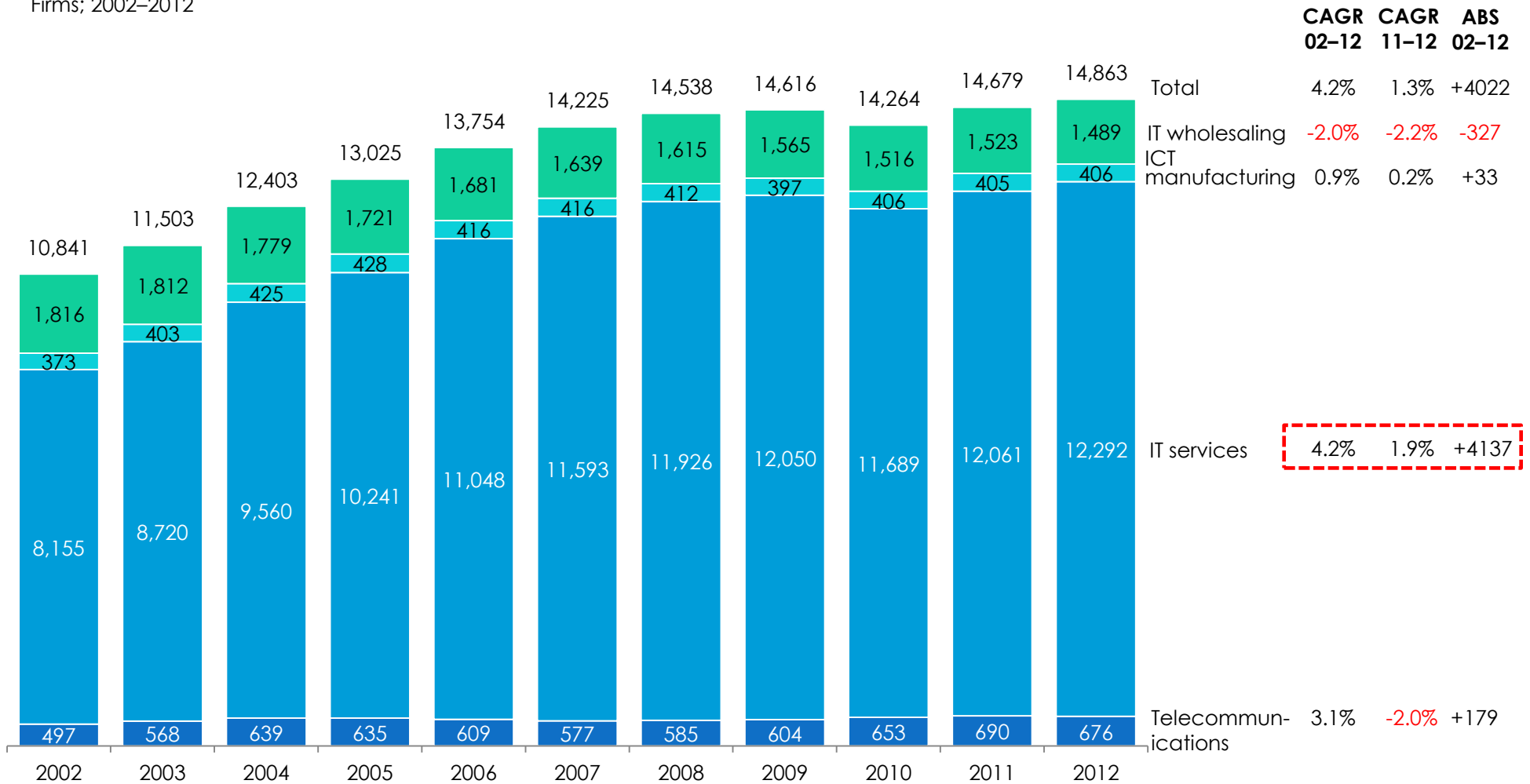
- High
- Medium
- Low

Number of firms by major ICT sub-sector

By far the majority of ICT firms are in IT services

Number of firms by sub-sector

Firms; 2002–2012



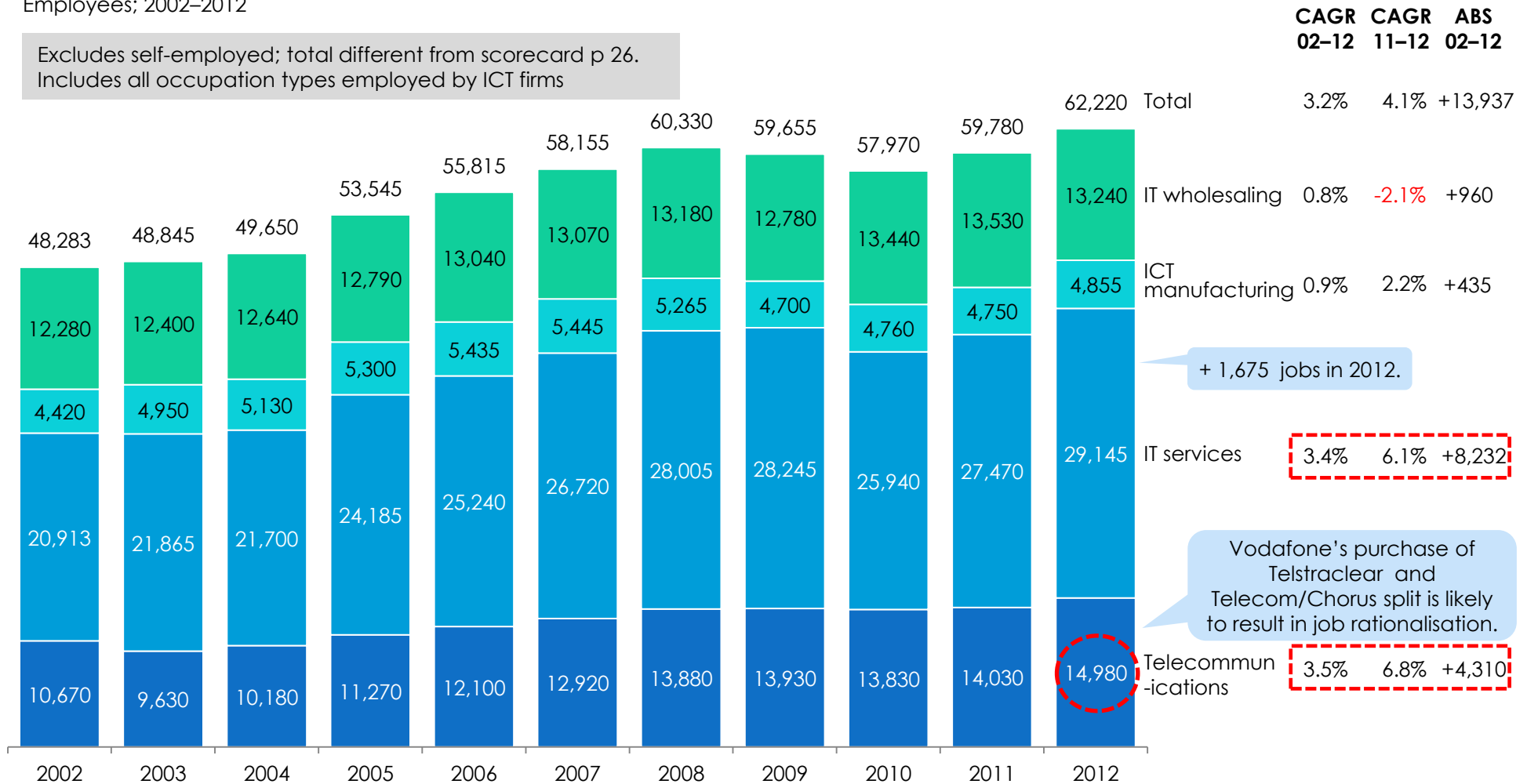
Number of employees by major ICT sub-sector

Employment growth is driven by telecommunications and IT services; IT services added 1,675 jobs in 2012

Number of employees by sub-sector

Employees; 2002–2012

Excludes self-employed; total different from scorecard p 26.
Includes all occupation types employed by ICT firms



OECD definition: industry comment

Industry leaders commented that aggregated data on the ICT sector is misleading

- *ICT is a misleading description. IT and telecommunications are really two quite different sectors. The IT sector is a story of growth. Compare that to the financial performance of the telecommunications sector, and what you see is a tapering off and not a huge amount of growth. What this results in is a picture that understates the contribution that IT is making and doesn't recognise the increasing head-winds in the telecommunications industry.*
 - CE, industry body
- *I think about ICT as the telcos or the specific software companies, and then the digital economy is separate. So how is the rest of the economy using ICT? How are farmers using the systems of geo-spatial technology to improve irrigation efficiency?*
 - New Zealand representative, very large multinational
- *It's hard to align these categorisations with the real world. Intuitively they don't make sense. IT services and ICT manufacturing are fundamentally different business models. The capital requirements for software are very different to manufacturing devices. The two business areas don't overlap.*
 - Partner, technology law firm
- *There needs to be a clearer differentiation between those [multinational] companies that are in New Zealand providing services, and those New Zealand companies that are doing creative stuff and are looking to expand internationally.*
 - CE, small-medium IT product firm.
- *We would see value in differentiating between multinational and domestic companies. A lot of innovation occurs in small and start-up New Zealand-owned companies that have the potential to grow quite rapidly. The thing you've got to be mindful of is that grouping certain organisations together may not be representative. IT services companies might include customer services related staff in call centres. If you bundle these together with pure IT companies, you are looking at an average salary that is not representative of the opportunities that might be there.*
 - CE, industry association

ICT sector: industry characteristics

Firms in the three different activities captured by the definition for ICT have very different dynamics and capital requirements

ICT sub-sector	Description	Characteristics
ICT manufacturing	Manufacturing of physical devices or components. Will contain a software component, typically embedded in the device or product (a chip needs some code for it to do anything).	ICT manufacturing is a sub-set of high technology manufacturing. It is an engineering-based activity that is more capital intensive than software-based businesses.
IT services	<p>IT services firms typically implement and administer IT systems for medium to large organisations.</p> <p>IT product firms typically develop software and/or web applications for a specific purpose (e.g. provide accounting services).</p>	<p>Low capital requirements to get established, develop and launch a product, as the main cost is human resources.</p> <p>Higher capital requirements to scale and develop an international customer base.</p>
Telecommunications	Telecommunications is a network industry. Firms provide telecommunications services using wireless or wired infrastructure.	A scale operation with high capital requirements, e.g. in establishing wireless or wired (such as fibre) networks and associated equipment and in upgrading these to latest technology, such as 4G.

In response to feedback, the bulk of this report focuses on the largest IT services sub-sector – computer system design and related services.

Firms classified as ICT manufacturing are also captured by the definition for high technology manufacturing. Refer to the High Technology Manufacturing Report available from www.mbie.govt.nz



IT SERVICES SECTOR

Focusing on computer system design and related services

IT services sub-sectors

The IT services sector is made up of six sub-sectors, covering a wide range of activities

Sub-sector	Description	ANZSIC code*	Examples
Other goods and equipment rental and hiring n.e.c.	Firms mainly engaged in hiring or leasing of goods and equipment not elsewhere classified, including electronic equipment.	L6639	Vidcom New Zealand
Computer system design and related services	Firms engaged in providing expertise in the field of information technology. Includes consulting services around computer hardware programming and software, internet and web design. Also includes customised software development (except software publishing), software installation services and systems analysis services. For the purposes of this report it is assumed that software-as-a-service businesses (for example) are captured in this classification. In any case, as the largest IT subsector, it is assumed that the data is representative of the structure and dynamics of New Zealand's cohort of IT firms.	M7000	Orion Healthcare
Software publishing	Firms mainly engaged in creating and disseminating ready-made (non-customised) computer software.	J5420	Pingar
Data processing and web hosting services	Firms mainly engaged in providing electronic data processing or hosting services, including web hosting, streaming services or application hosting and application service provisioning. Includes provision of complete processing and specialised reports from data supplied by customers or automated data processing and data entry services.	J5921	Revera
Electronic information storage services	Firms mainly engaged in providing electronic information storage and retrieval services (excludes library services).	J5922	Paymark
Electronic (except domestic appliance) and precision equipment repair and maintenance	Firms engaged in repairing and maintaining electronic equipment (except domestic appliances) such as computers and communications equipment, and/or highly specialised precision instruments.	S9422	Kinetics Group

Comparative size of IT services sub-sectors

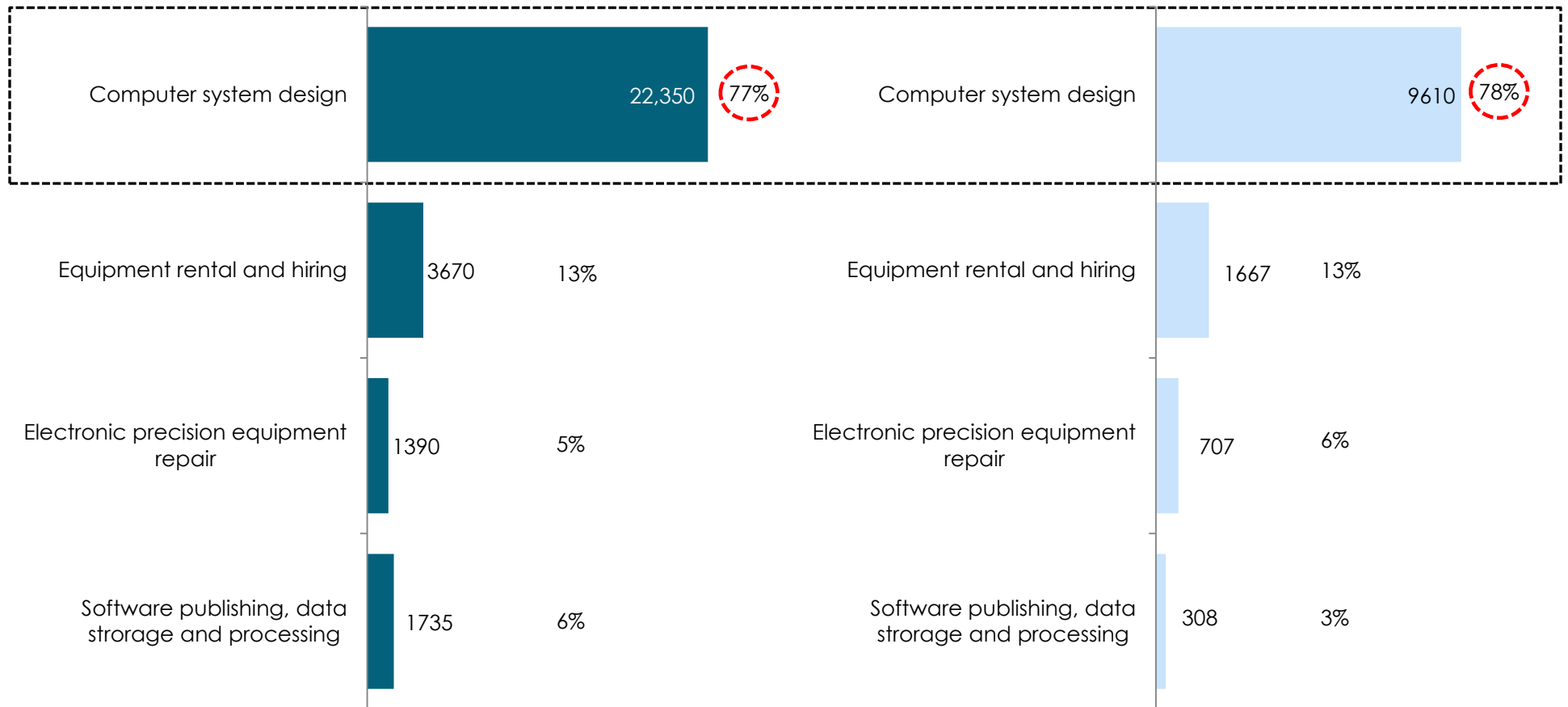
Computer system design is by far the largest IT services sub-sector, and is the focus of this report's analysis (see appendix for full definition)

Number of employees by sub-sector

Employees; 2012

Number of firms by sub-sector

Firms; 2012



Business types in computer system design: service providers

Two broad types of IT businesses in computer system design can be identified: services businesses and product businesses

Selected examples of IT services firms operating in New Zealand

Services businesses	
<p>General characteristics of IT services businesses</p>	<p>High-value, high-volume, low-margin business. Typically larger firms that provide professional and IT infrastructure related services for medium to large corporates or other organisations, e.g. government departments. Systems are built primarily using well-known technologies from Microsoft, Oracle, SAP and similar. Largely focused on the New Zealand market.</p> <p>Most well-known multinational IT services firms operate in this space in New Zealand. These firms are important as they support the digitisation of the New Zealand economy, through supporting government and businesses to do business electronically. Some New Zealand owned firms, such as Datacom, have expanded internationally, particularly in Australia. These international operations will generally not appear as exports in the statistics, although there may be management fees which count as exports. Profits earned on the outwards direct investment will appear as direct investment income in the balance of payments.</p>
Example firms	Services
<p>Datacom (NZ, private)</p>	<p>Provides a full range of IT services such as IT management, software development, business applications, websites, intranets, infrastructure outsourcing and data centres. Significant business in Australia and expanding into Asia.</p>
<p>Fronde systems (Listed, NZX)</p>	<p>Designs, builds and integrates software solutions particularly for large organisations, e.g. government departments. Also operates in Sydney and Canberra.</p>
<p>Fujitsu (multinational)</p>	<p>Provider of IT products and services, including hardware, software, networking and business solutions, and more.</p>
<p>IBM (multinational)</p>	<p>Full range of IT products and services.</p>
<p>Optimisation (NZ, private)</p>	<p>Services include development and integration, web enabled business, consulting, testing, outsourcing, managed resource services and software support.</p>
<p>Intergen (NZ, private)</p>	<p>Provides a range of IT solutions for business, including provision and support of Microsoft-based solutions. Has established a presence in Australia.</p>

Business types in computer system design: product developers

New Zealand IT product firms typically focus on developing products that exploit a niche opportunity; most are exporting

Selected examples of IT product firms operating in New Zealand

Product businesses			
Firm	Industry/niche targeted	Products	Comments
General characteristics of IT product businesses	<p>High-margin, high-growth potential businesses. Typically focused on developing applications or products focused on a specific sector (e.g. health), or specific business operation (e.g. accounting) or a specific service (e.g. online auctions). These businesses can be established and a product launched with a relatively small amount of capital, as the key assets are intellectual property and human capability. Such businesses have the capacity to scale rapidly if the product is proved in the market, although this takes significant additional capital. Staff requirements are low when compared to the value created. These businesses have the potential to create significant value and appear to be driving exports in the sector. Typically, exporting also involves establishing offices in market to provide sales, marketing and customer support services, as the following examples demonstrate.</p>		
Vista Entertainment Solutions (Private)	Entertainment industry, particularly multiplex cinemas	<ul style="list-style-type: none"> • Software for management of all aspects of a multiplex cinema. • Customised software services to the entertainment industry. • Internet-based software-as-a-service model, Veezi, for smaller cinemas that cannot afford the deluxe Vista version, using a pay-as-you-go cloud-based model. 	<ul style="list-style-type: none"> • 23% market share globally, 53 countries. • \$30m revenue (est). • 125 staff. • Mixed business model, sells direct in some countries and through partners in others • Vista has a global partner network with representatives in 11 countries.
Konnect Net (Private)	Insurance industry	<ul style="list-style-type: none"> • Integrated suite of process management services that facilitate the capture, transfer and management of information across the finance, health and corporate sectors, replacing time-consuming paper based systems. 	<ul style="list-style-type: none"> • \$12–15m revenue (est). • 80 staff (est). • Australian office established.
Xero (Listed, NZX) Total market capitalisation as at 6 May 2013 \$1.612b	Accounting software for small and medium businesses	<ul style="list-style-type: none"> • Provides accounting software in the cloud by subscription. • Operates software-as-a-service business model. 	<ul style="list-style-type: none"> • \$40m revenue (year ended 31 March, 2013). • 350 staff (est). • Offices in Melbourne, Sydney, Brisbane, San Francisco and Milton Keynes.

Business types in computer system design: product developers *continued*

Selected examples of IT product firms operating in New Zealand

Firm	Industry/niche targeted	Products	Comments
COMRAD (Private)	Health, radiology	<ul style="list-style-type: none"> The COMRAD Radiology Information System (RIS) – software solutions for radiology market. 	<ul style="list-style-type: none"> \$7m revenue (est). 42 staff. System installed in 390 practices in New Zealand and Australia. Offices in Sydney and Melbourne.
Biomatters (Private/VC)	DNA analysis.	<ul style="list-style-type: none"> Geneius; Molecular Profiler. Biomatters' applications translate genomic data into biological and clinical insights. 	<ul style="list-style-type: none"> \$4m revenue (est) 21 staff Office in San Francisco
ARANZ Geo (Private)	Mining, geothermal and hydrogeology.	<ul style="list-style-type: none"> Core product is the Leapfrog® 3D geological modelling software for the mining, hydrogeology and geothermal industries. 	<ul style="list-style-type: none"> <i>ARANZ Geo has a 50-strong Christchurch based team and a further 35 staff located across a network of local support offices... Around 98% of the company's software is exported.</i> -scoop.co.nz, March 2013.
Gentrack (Private/VC)	Utilities & airports	<ul style="list-style-type: none"> Specialist billing, customer relationship management and revenue assurance software solutions for energy and water utilities, heating schemes and airports. Also provides business and industry consulting and project management services. 	<ul style="list-style-type: none"> \$25–30m turnover (est). 140 staff. Six offices worldwide including Melbourne, Orlando, New York, London, Manchester.
Diligent Board Member Services (Listed, NZX) Total market capitalisation as at 6 May 2013 \$594 million	Corporate governance	<ul style="list-style-type: none"> Provides directors with access to board papers in the cloud, through a bespoke portal, Boardbooks. Operates software-as-a-service business model, income listed as 'licensing revenue'. 	<ul style="list-style-type: none"> Provides services to 2,800 boards globally . \$44m revenue (2012). 138 staff (global). Offices in New Zealand, United States, the United Kingdom, Australia, Singapore, Canada, the Netherlands and Hong Kong.

Industry comment: IT product businesses

- *IT product business develop their own software seeking to exploit an opportunity that is probably lower volume and higher margin [than IT services businesses]. These businesses are the export sector. IT product businesses are very scalable, but the scale is disconnected to the number of people they employ. They are capable of creating enterprise value not linked to the cost-base of the business. They don't contribute to GDP in the way a telco does. They are not producing the money a telco does circulating around the system, except when they sell... the \$700 million coming in from Fairfax on the day Trademe sold did affect New Zealand's balance of payments that month – probably that year. And of course much of that capital is being re-invested into new high growth businesses.*
 - Partner, technology law firm
- *Innovation is on the up in New Zealand. I've seen more positive activity that is gaining traction than I've seen in a long time. Back in the early 2000s when they set up the HighGrowth challenges nobody got close. And we're starting to see some people getting close now. Back then the world wasn't ready. Now with the Facebook revolution, Paypal and others, those things have just changed the way we think about stuff. We've learnt from them to give away our software. When people say 'how much is your software' we say 'free'. We don't give it to you. You get to use it. We build systems. We give you a system to do a specific thing.*
 - CE, small-medium IT product firm

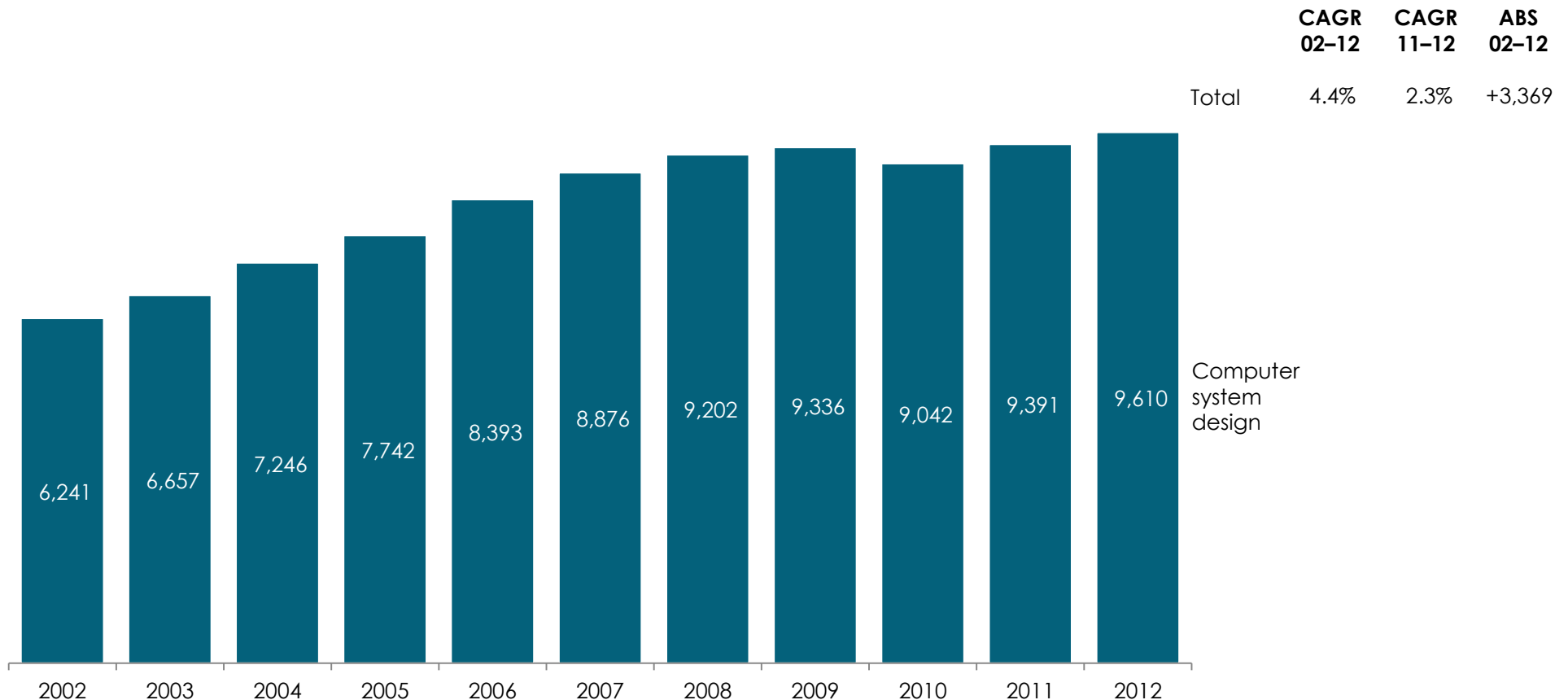
Number of computer system design firms

Computer system design has added 3,369 firms since 2002; growth in firm numbers resumed in 2011 after dip in 2010

Number of firms

Firms; 2002–2012

Includes firms with no employees

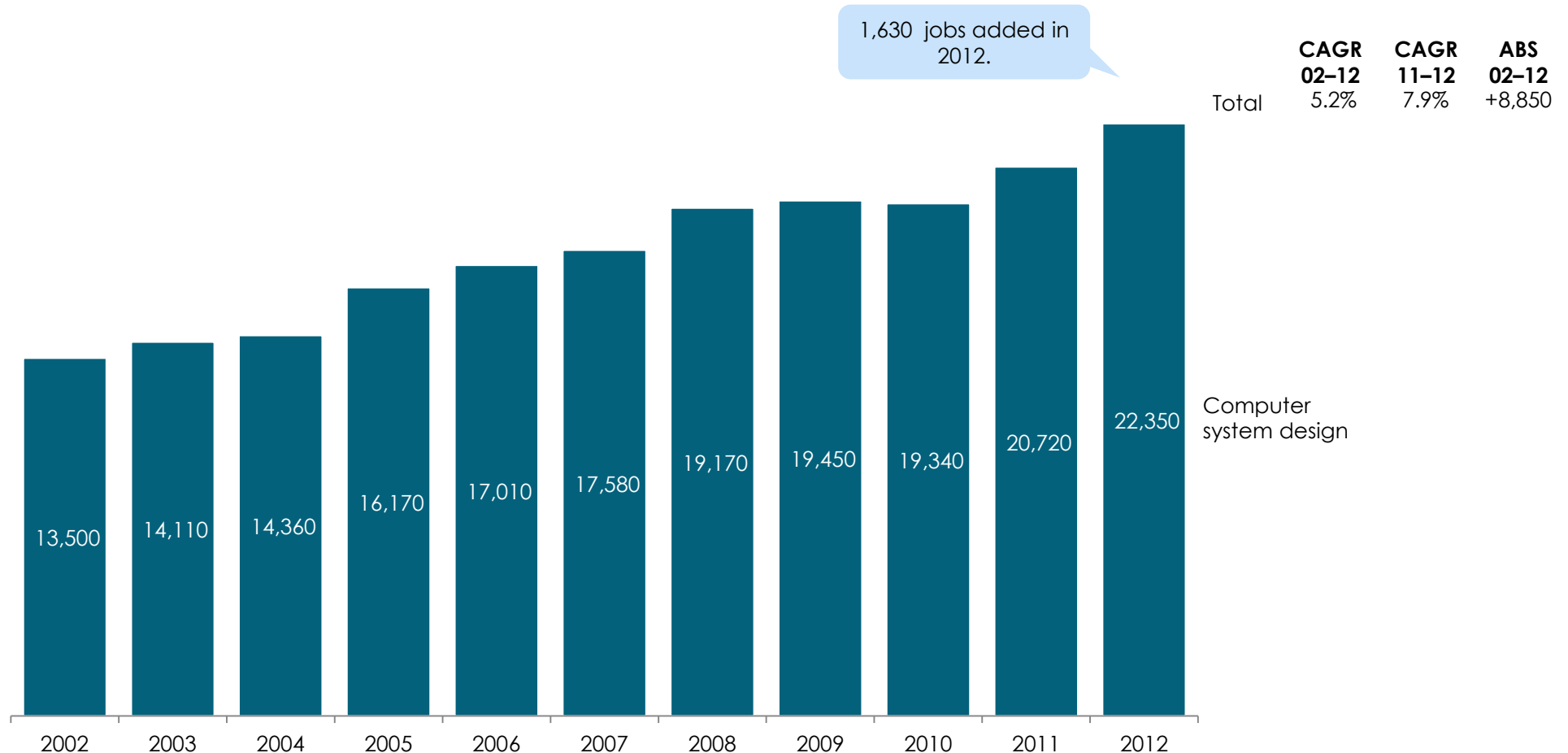


Computer system design: number of employees

Computer system design has shown strong employment growth

Number of employees

Employees; 2002–2012

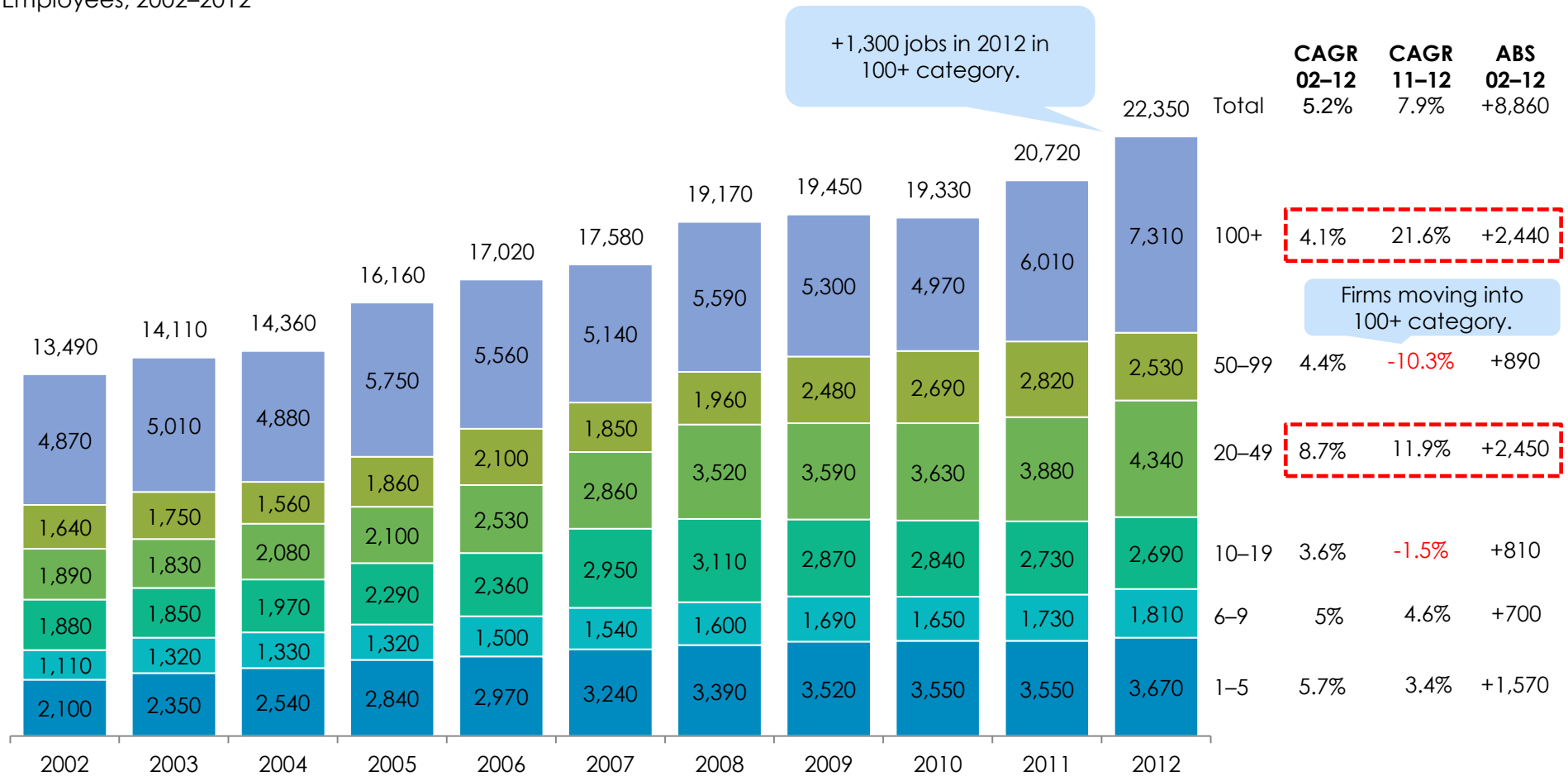


Computer system design: employment by firm size

Employment growth has been driven by firms of all sizes

Number of employees by firm size

Employees; 2002–2012



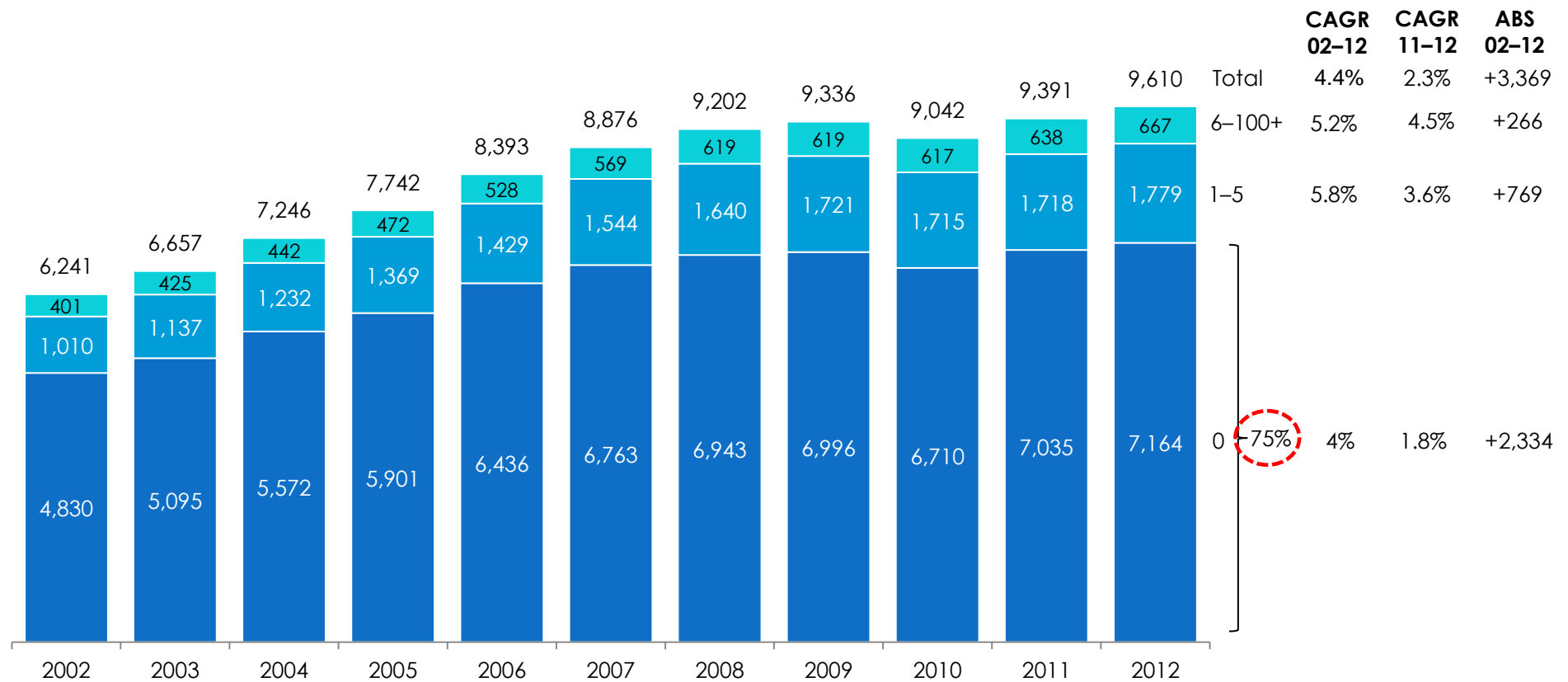
Note: totals may not match other pages due to rounding; Source: Statistics New Zealand Business Demography Statistics, 2012

Computer system design: firms by employment size

75% of firms have no employees; these are likely to be private contractors

Number of firms by employee numbers (firms with six or more employees aggregated)

Firms; 2002–2012



Note: totals may not match other pages due to rounding; Source: Statistics New Zealand Business Demography Statistics, 2012

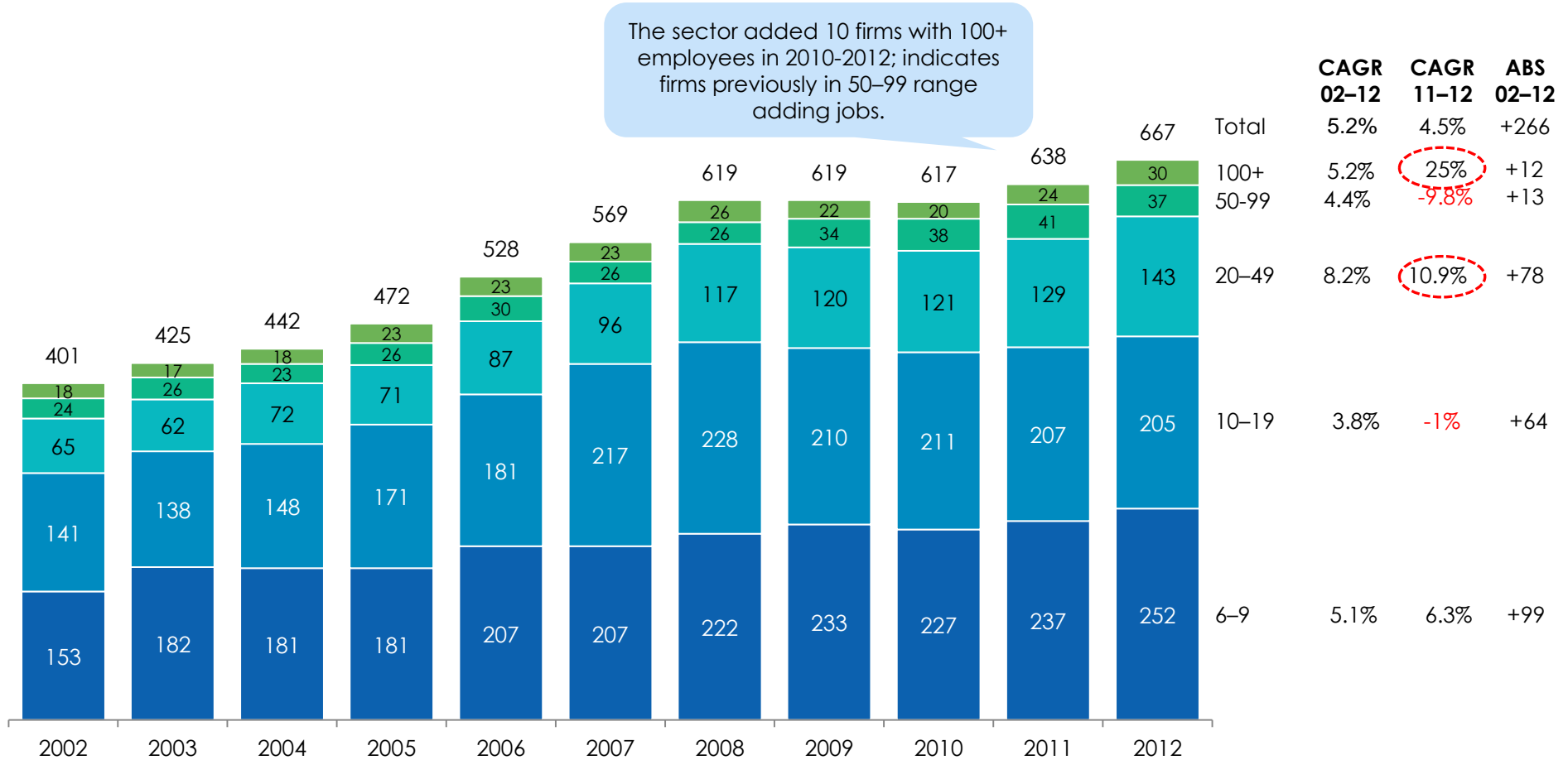
Computer system design: firms by employment size *continued*

The sector is adding mid-sized firms (20–49 employees) and large firms (100+ employees) at a good rate; with a surge in 2011 & 2012

Number of firms by employee numbers (six employees and above)

Firms; 2002–2012

The sector added 10 firms with 100+ employees in 2010-2012; indicates firms previously in 50–99 range adding jobs.



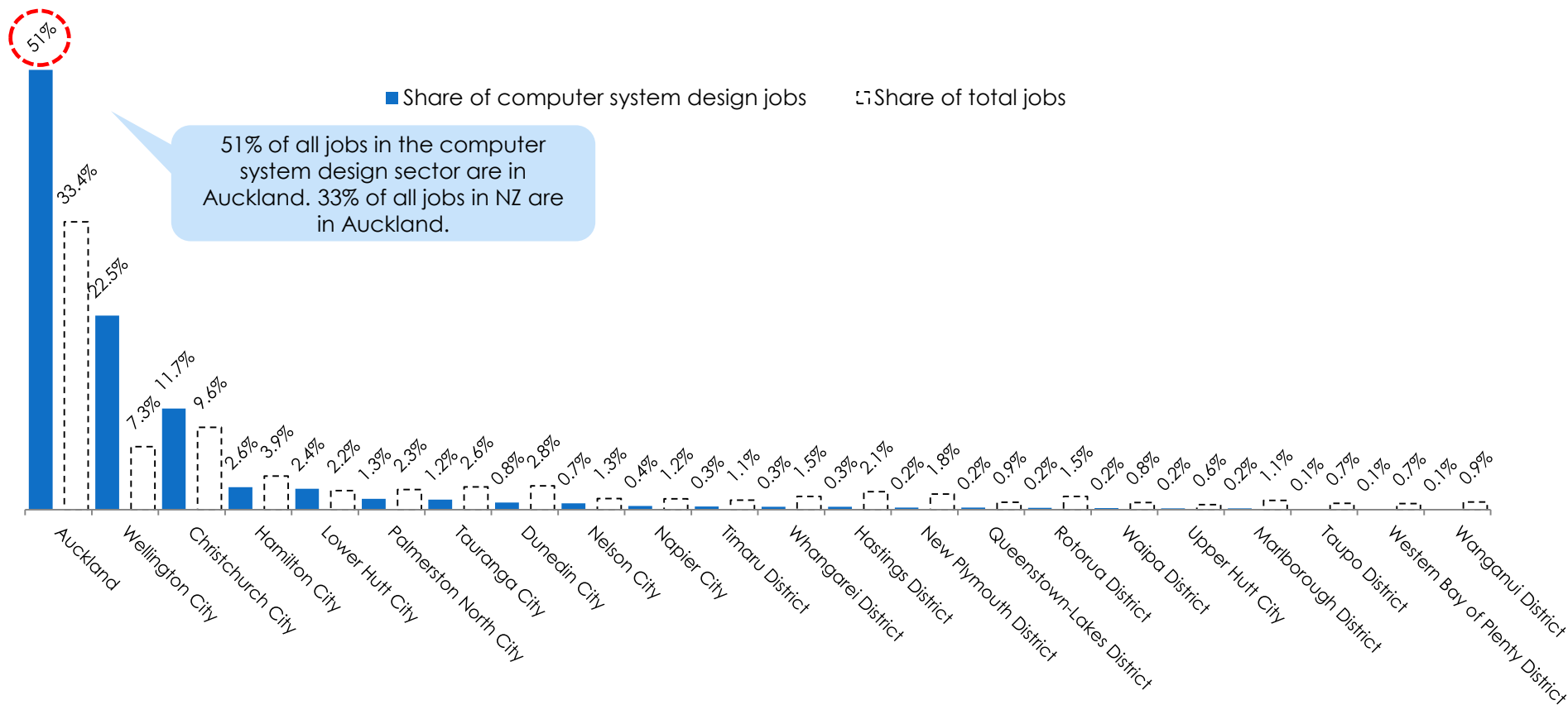
Note: totals may not match other pages due to rounding; Source: Statistics New Zealand Business Demographics database

Location

Computer system design jobs are concentrated in Auckland, Wellington and Christchurch

Share of computer system design employees versus all employees by region

% employees; 2012

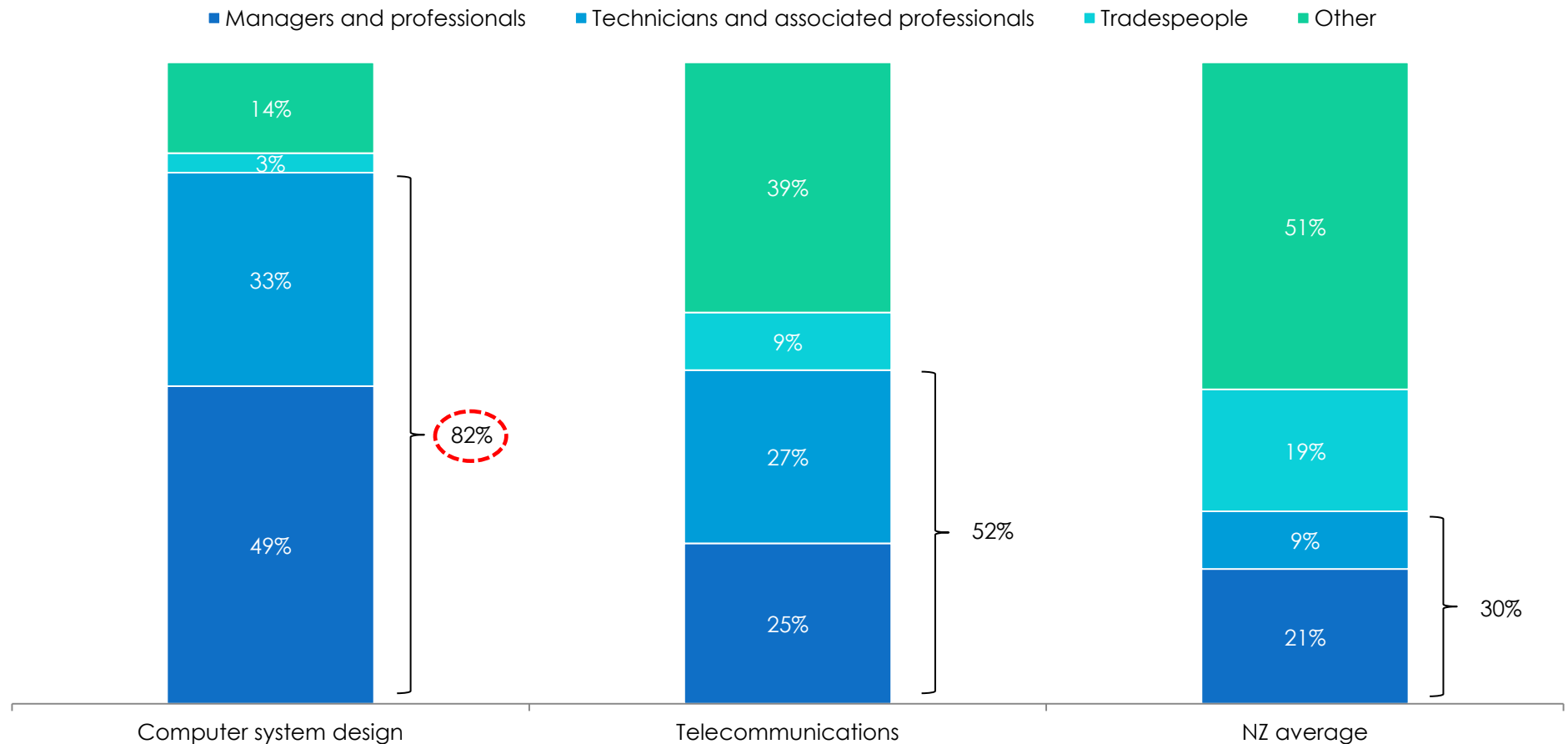


Composition of workforce by occupational group

82% of the workforce in computer system design are managers, professionals or technicians

Workforce by occupational group*

% workforce; 2012



*Note: Total survey sample is 35,976 firms with six or more employees; 600 of these firms are in computer system design.

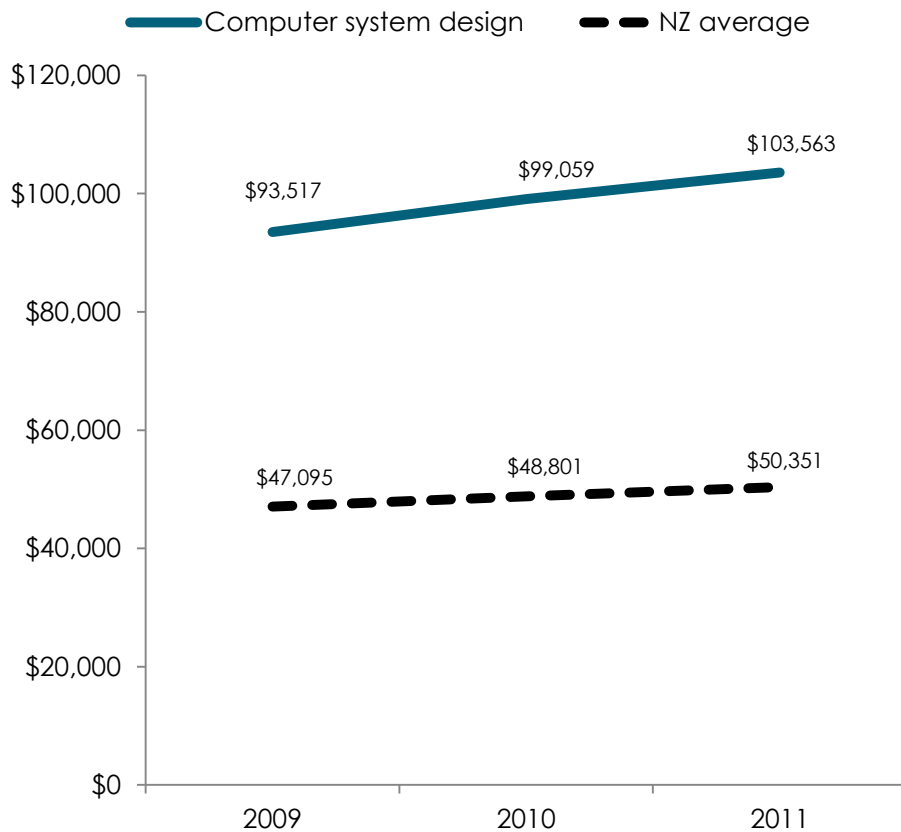
Source: Statistics New Zealand, Business Operations Survey (2012)

Computer system design wages/salaries

Wages/salaries in computer system design are twice the New Zealand average and are growing faster

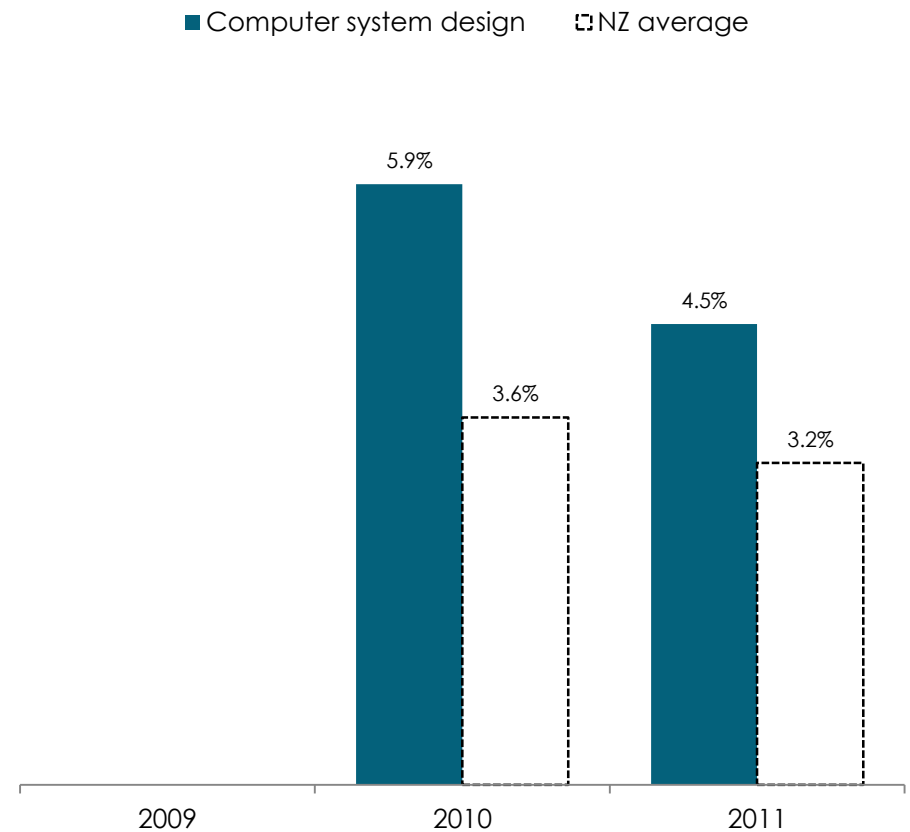
Average salary/wages

NZ\$; 2009–2011



Growth in average salaries/wages

%; 2009–2011



Note: average wage is calculated by total salaries & wages paid, divided by number of employees

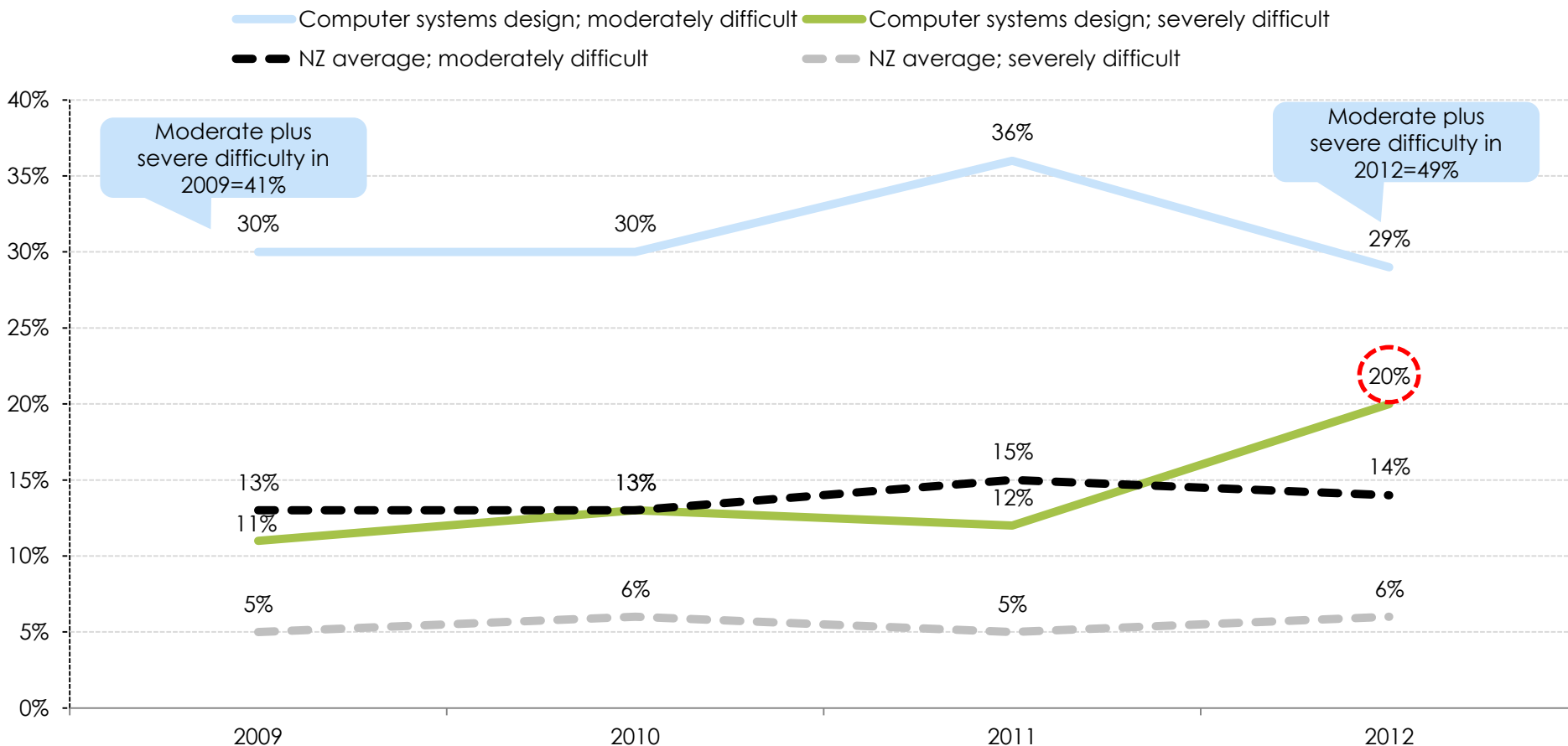
Source: Statistics New Zealand, Annual Enterprise Survey

Recruitment: managers and professionals

Around half of computer system design firms report difficulty recruiting managers and professionals, with severe difficulty increasing

Computer system design firms reporting severe or moderate difficulty in recruiting managers and professionals*

% firms; 2012



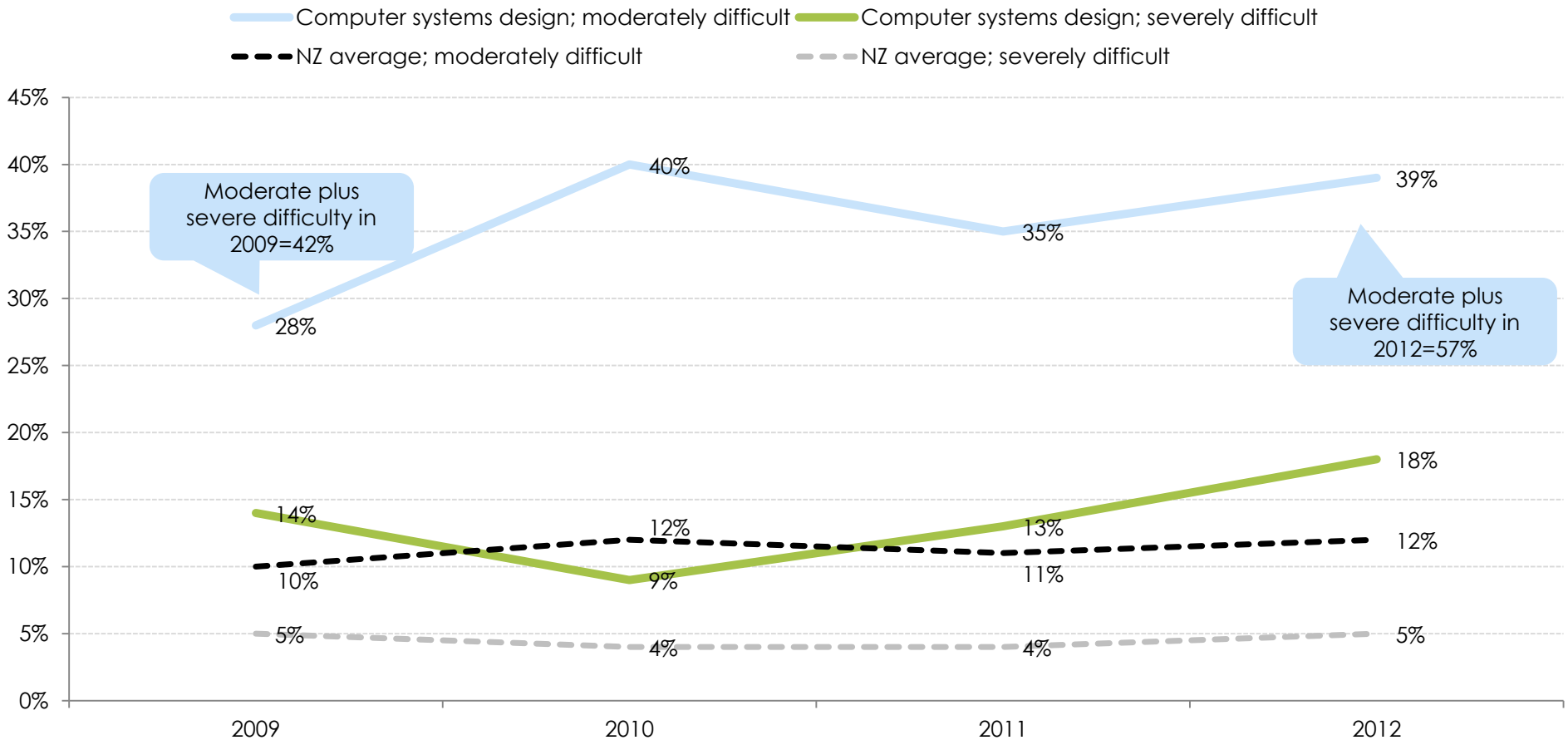
*Note: Total survey sample is 35,976 firms with six or more employees; 600 of these firms are in computer system design.

Source: Statistics New Zealand, Business Operations Survey (2011 & 2012)

Recruitment: technicians and associated professionals

Computer system design firms report increasing difficulty recruiting technicians and associated professionals

Computer system design firms reporting severe or moderate difficulty in recruiting technicians and associated professionals*
 % firms; 2012



*Note: Total survey sample is 35,976 firms with six or more employees; 600 of these firms are in computer system design.
 Source: Statistics New Zealand, Business Operations Survey (2011 & 2012)

Industry comment: recruitment

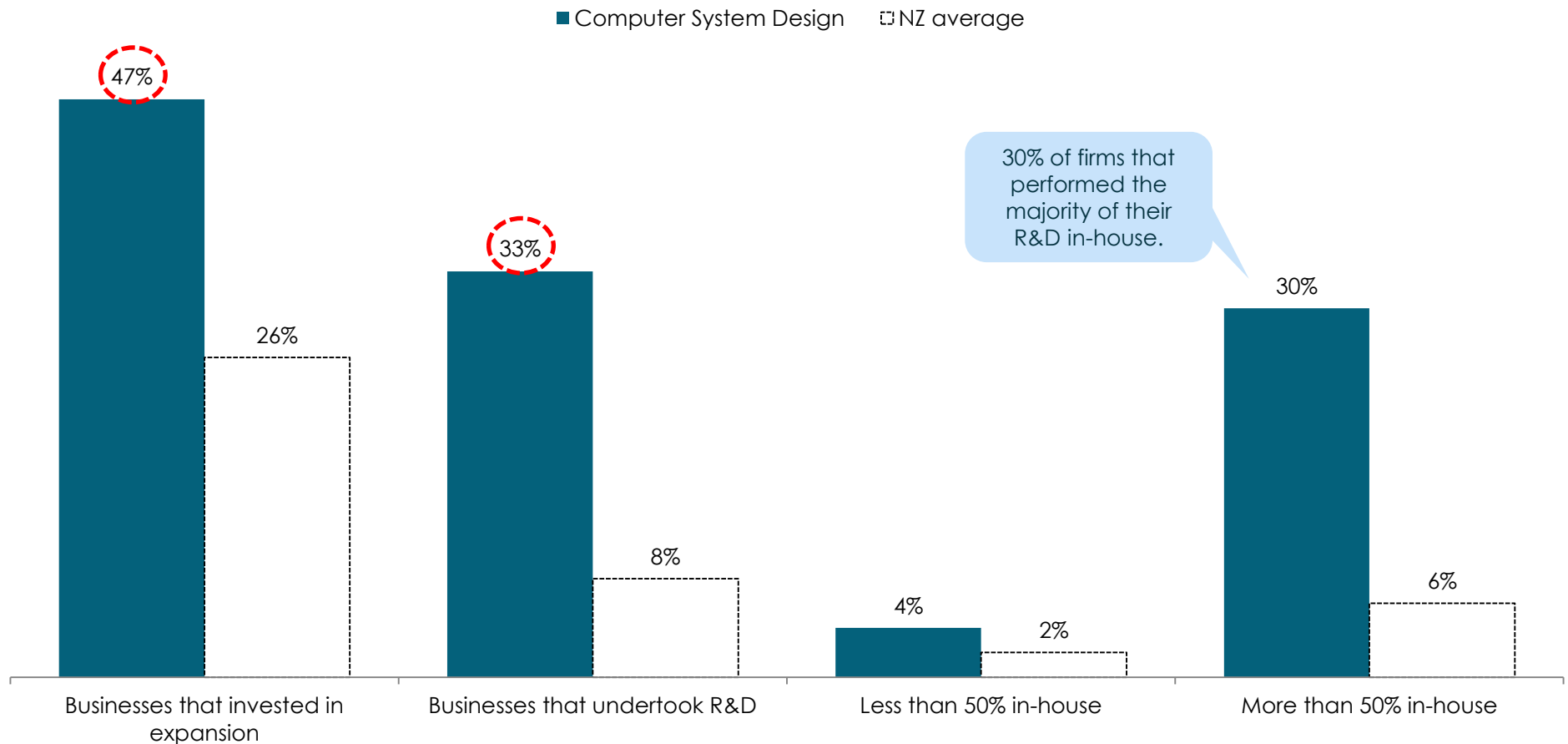
- *In high tech manufacturing the raw smarts come out of highly trained and expensive individuals, like electrical engineers and computer engineers that have been through an engineering degree. The raw skill set you need is rarer and more expensive. Whereas with IT services and software in New Zealand – yes, it draws on computer science degrees and post-graduate degrees. And some of the really clever software has been developed by people with PhDs. But there are also a lot of really good web businesses or mobile app businesses that are being built by people who have had short course training in web development and mobile app development. And some people are self-taught.*
 - Partner, technology law firm
- *The best guesstimate is that we will need twice as many people working in the technology industry – broadly defined – as we have today. The biggest bottleneck is the scarcity of people. These are not just IT occupations, but a whole range of skills such as project managers, marketers, sales people, administrators and business analysts. These people don't all need a degree in computer science. They can come from any industry, from insurance or banking.*
 - CE, industry body
- *I've been in the IT sector for 30 years, and its been the same for thirty years, It always takes time to find good people. And if it didn't, then they probably wouldn't be good. Do I think we need more of them? I don't think the issue is quite as bad for us as it is for the very large corporates, in that they have huge numbers of people to deal with. Whereas we are more focused on highly specialist type skills.*
 - CE, small-medium IT product firm

Investment in expansion and R&D

Nearly half of computer system design firms invested in expansion in 2012; a third also invested in R&D

Investment in expansion and R&D vs NZ average*

% firms; 2012



*Note: Total survey sample is 35,976 firms with six or more employee; 600 of these firms are in computer system design.

Source: Statistics New Zealand, Business Operations Survey (2012)

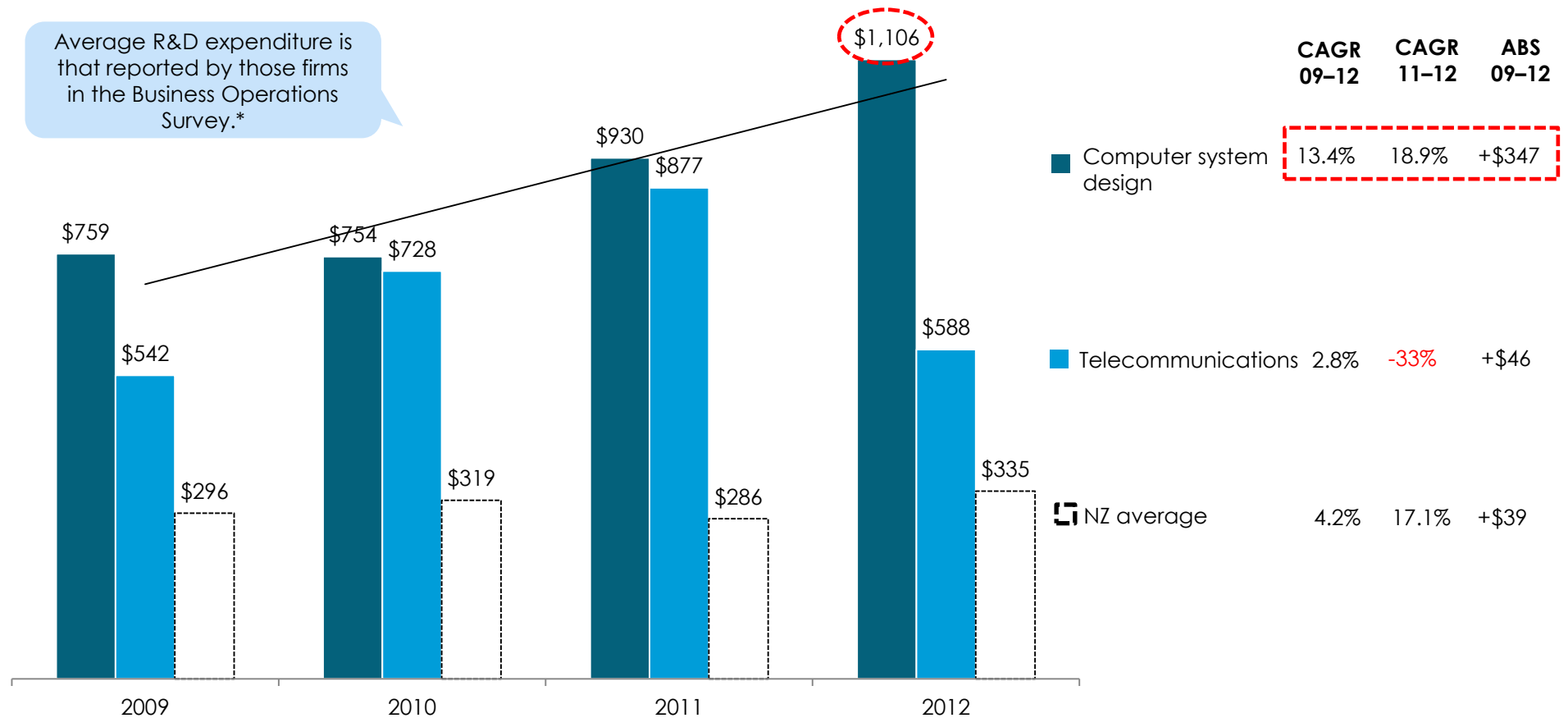
Average R&D expenditure

The computer system design sector is significantly increasing investment in R&D

Average R&D expenditure*

NZ\$000; 2009–2012

Average R&D expenditure is that reported by those firms in the Business Operations Survey.*



*Note: Total survey sample is 35,976 firms with six or more employee; 600 of the surveyed firms are in computer system design.

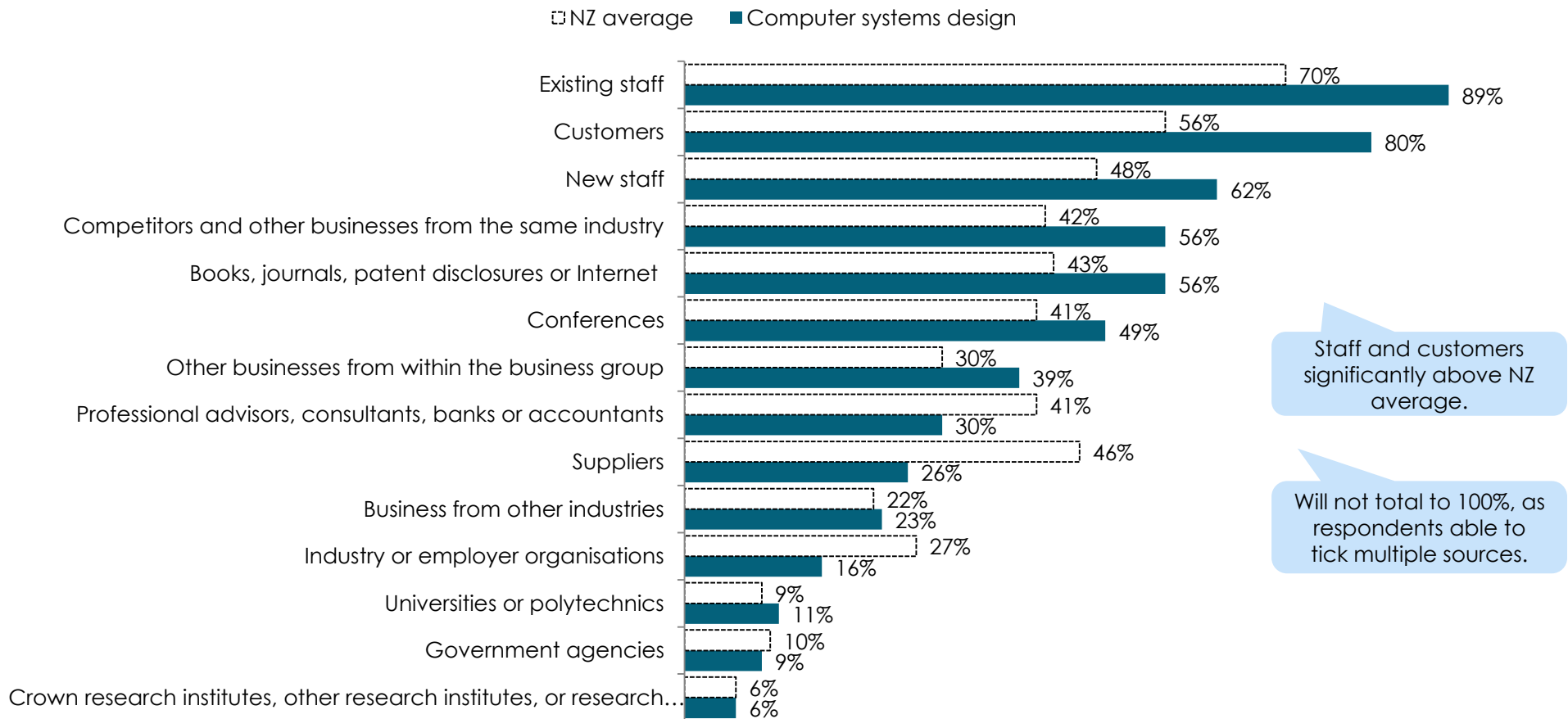
Source, Statistics NZ, Business Operations Survey, 2012

Source of ideas for innovation

Staff, customers, competitors, and formal and informal business networks are the key sources of ideas for innovation

Sources of ideas or information for innovation*

% of firms reporting each source; 2011



*Note: Total survey sample is 35,976 firms with six or more employees; 600 of these firms are in computer system design.

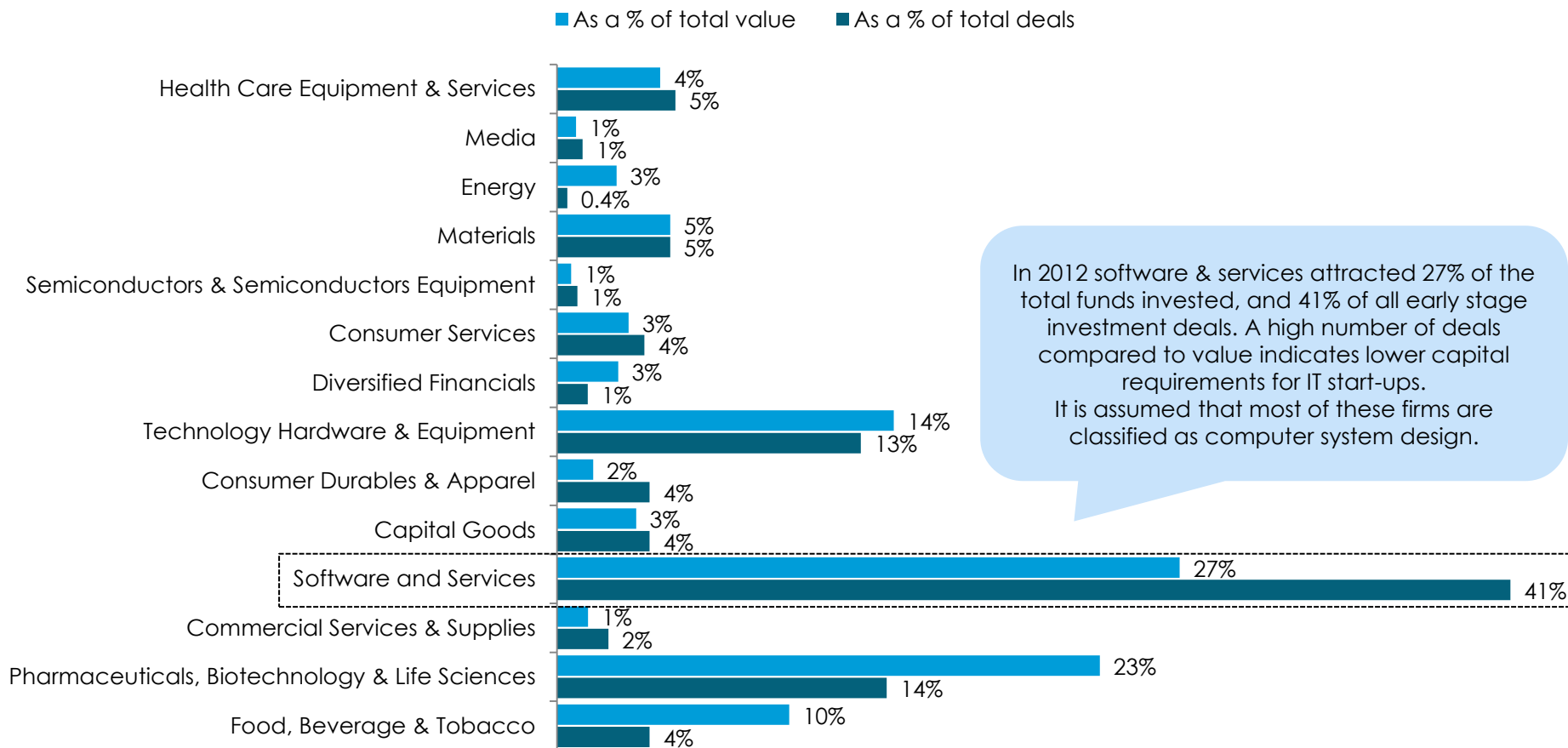
Source: Statistics New Zealand, customised data drawn from the Business Operations Survey (2011)

Early stage investment

Software and services start-ups are attracting investment

Early stage investment, value and number of deals by industry

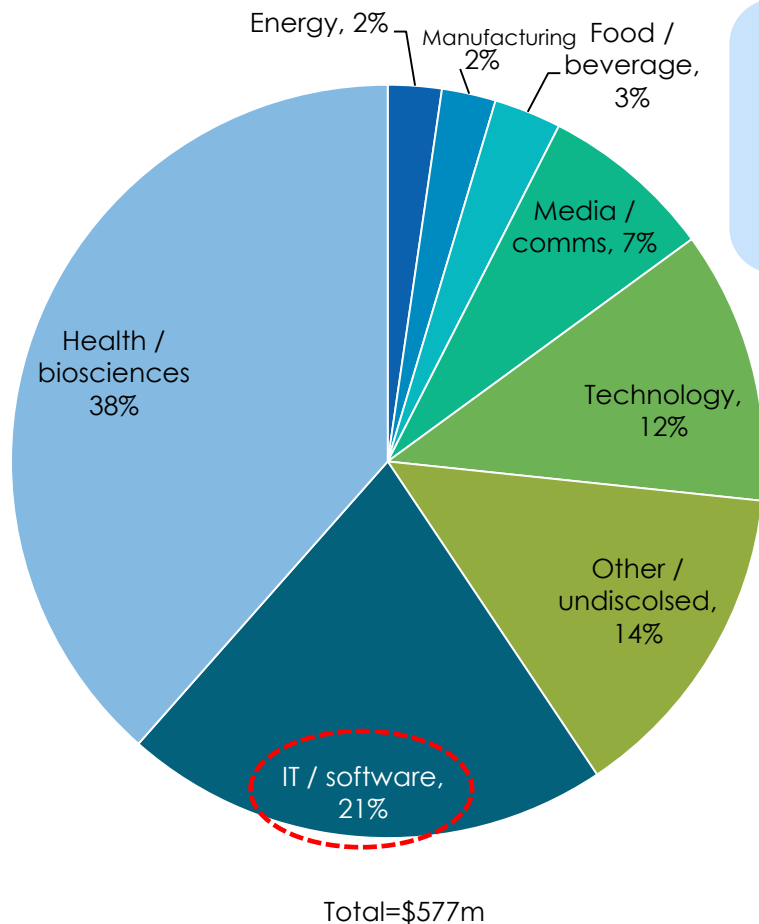
% deals and value; 2012



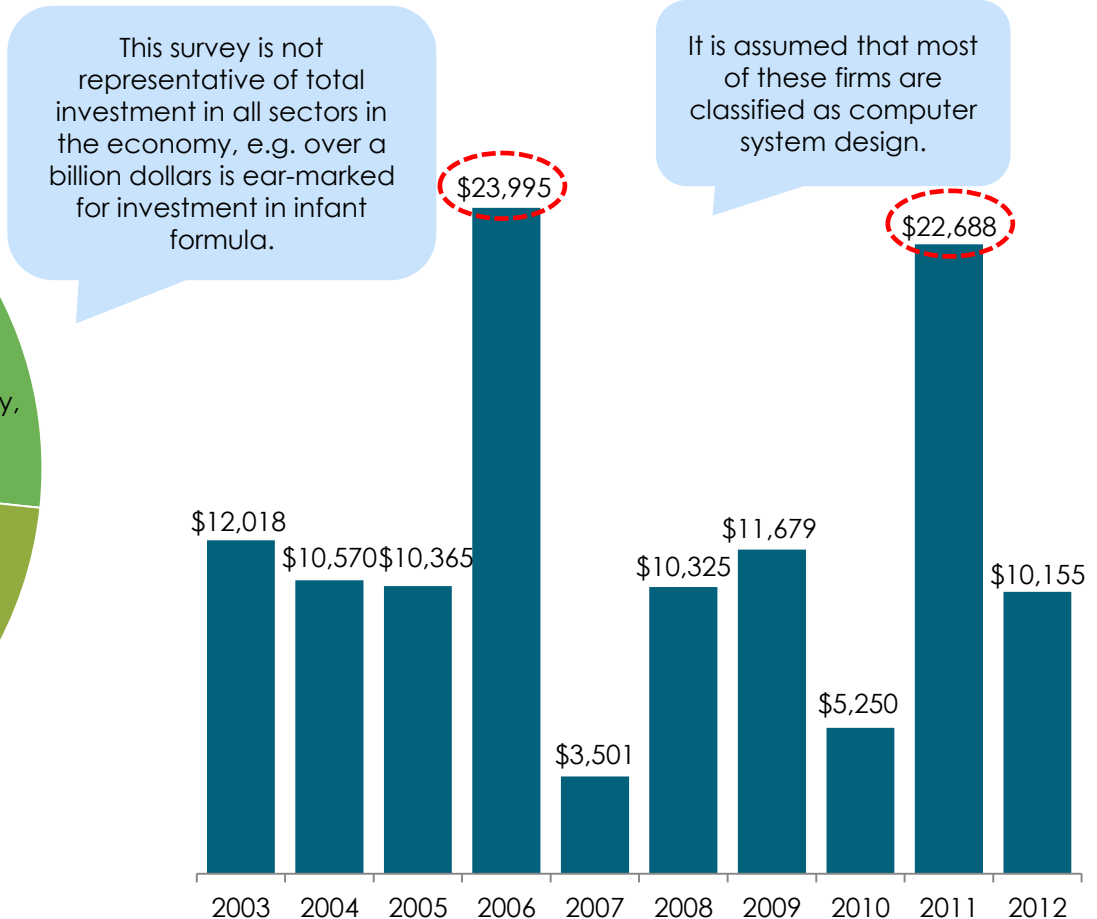
Venture and early stage investment

IT and software firms have attracted 21% of New Zealand's venture and early stage investment since 2003; 2006 and 2011 are stand-out years

Venture and early stage investment by category
%, 2003–2012



Venture and early stage investment in IT and software firms
NZ\$000; 2003–2012

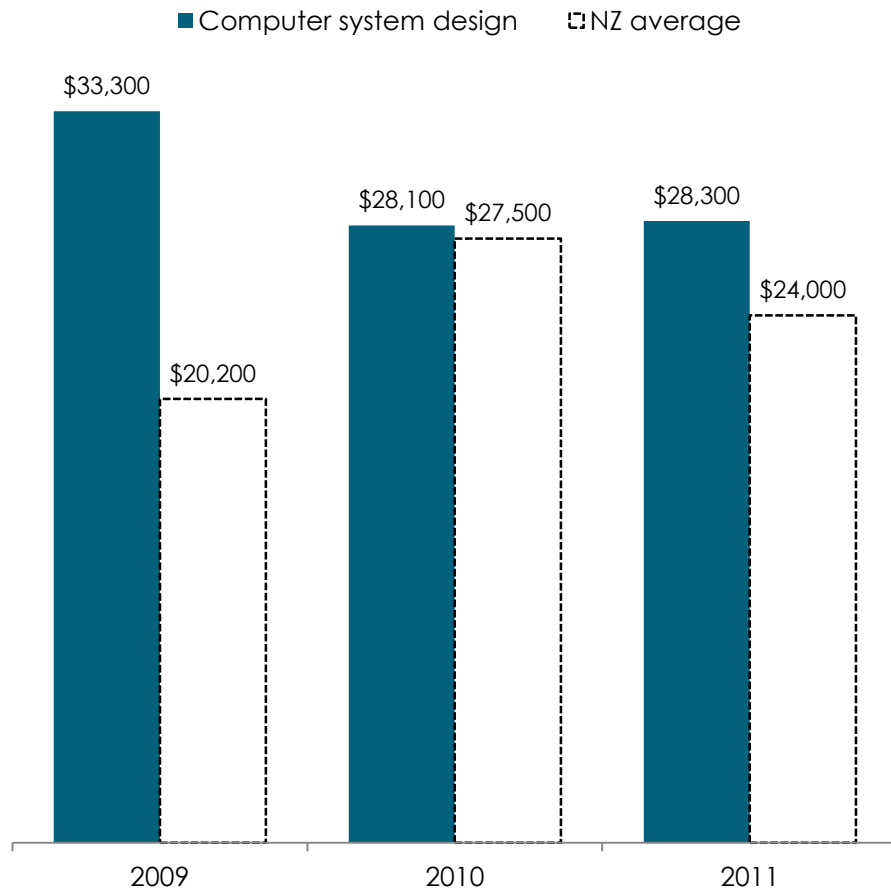


Financial performance

Firms in computer system design generate a good margin and a high return on equity

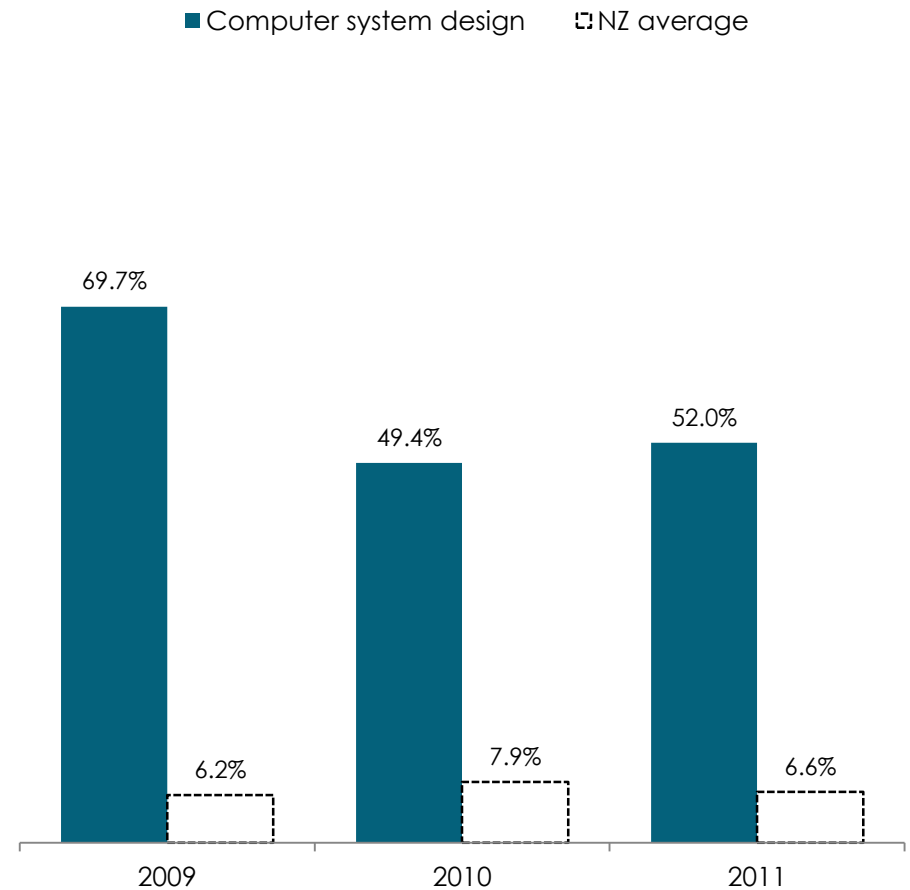
Surplus per employee

NZ\$; 2009–2011



Return on equity

%; 2009–2011

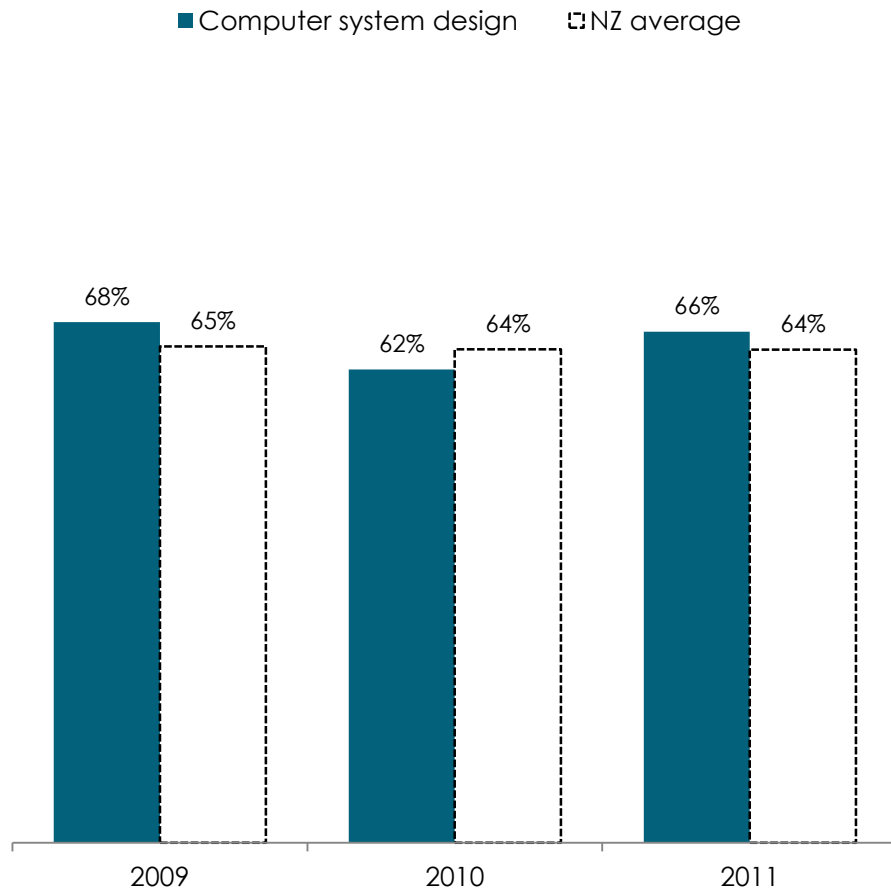


Financial performance

Income per employee is below the New Zealand average, but showing marginal improvement

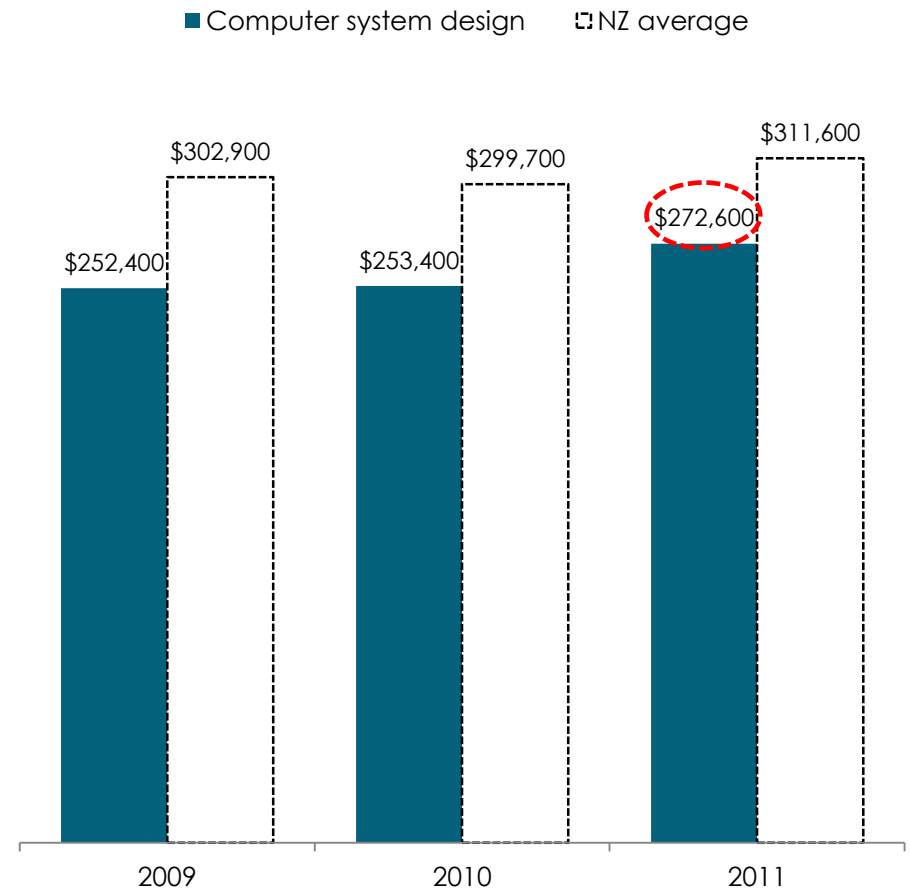
Debt ratio (total liabilities divided by total assets)

%; 2009–2011



Total income per employee

NZ\$; 2009–2011



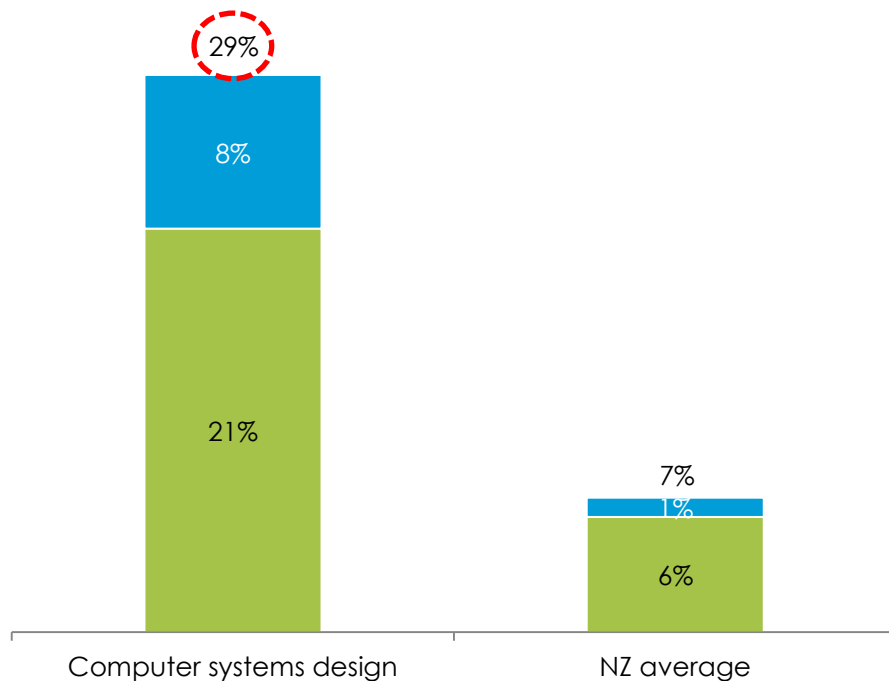
Strong international connections

Foreign investment in computer system design and outward investment by NZ-owned firms in this sector is significantly higher than NZ average

Computer system design firms with overseas ownership vs NZ average*

% firms; 2012

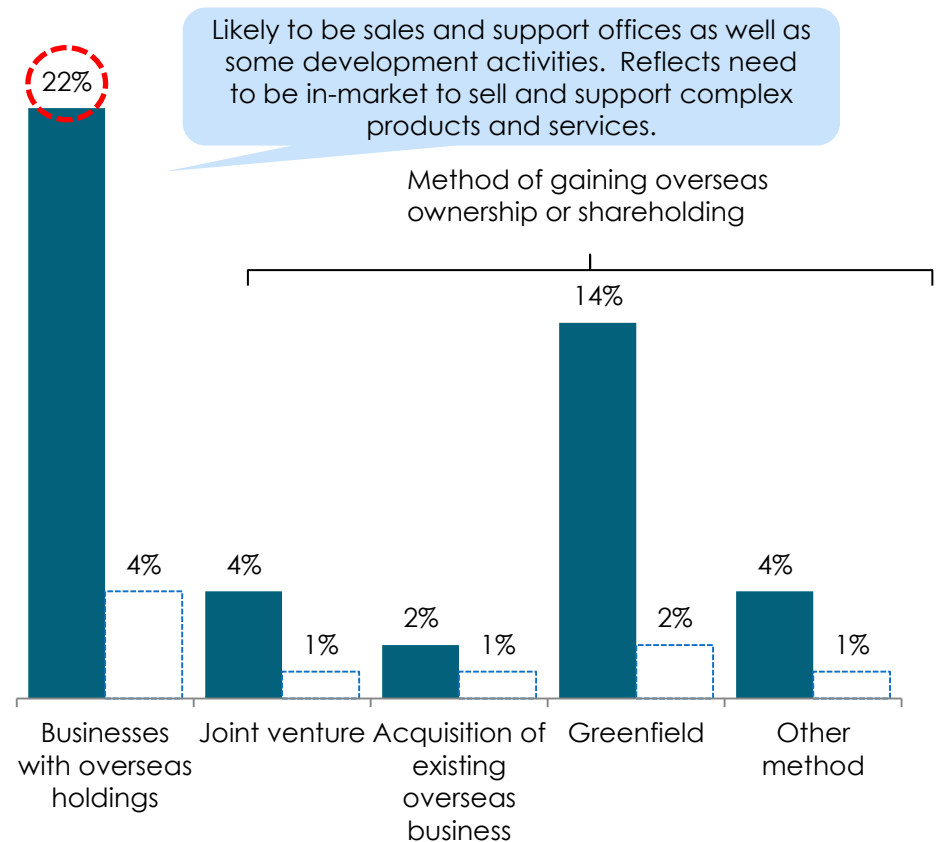
■ more than 50% foreign owned ■ less than 50% foreign owned



Computer system design firms with overseas holdings vs NZ average*

% firms; 2012

■ Computer system design □ NZ average



*Note: Total survey sample is 35,976 firms with six or more employees; 600 of these firms are in computer system design.

Source: Statistics New Zealand, Business Operations Survey (2012)

Industry comment: foreign investment

- *I think that one thing you could consider for the next report is some analysis of the value that acquisitions have on the local economy. There seems to be a school of thought that the acquisition of a local company by a foreign multi-national is a bad thing and that jobs will be lost offshore. Whilst that may be the case in the short term, the return on investment to investors and path to “liquidity events” for start-ups is invaluable and should not be under estimated. Israel is a very good example of this and they focused on their economy being an “incubator” for ICT companies.*
 - CE, small-medium IT product firm

Exports

There are two commercial services export categories which clearly relate to IT services

Category	Definition
Computer and information services	<p>Computer and information services cover computer data and news-related services between residents and non-residents.</p> <p>Computer services cover transactions involved with systems analysis, programming and maintenance, computer-related consultancy, the maintenance and repair of computer hardware, data entry, processing, outsourcing and facilities management and systems integration. Excluded are royalties and licence fees for computer software, the leasing of computer hardware and the export or import of computer hardware.</p> <p>Information services cover transactions involved with the provision of news, photographs and direct non-bulk subscriptions to newspapers and periodicals. Also included are database services, conception, data storage and the dissemination of data, both online and through magnetic media.</p>
Royalties and licence fees	<p>Royalties and licence fees cover payments and receipts between residents and non-residents for the authorised use of intangible, non-produced, non-financial assets and proprietary rights (e.g. patents, copyrights, trademarks, industrial processes, franchises) and the use, through licensing agreements, of produced originals or prototypes (e.g. manuscripts, films). Included in this category are software royalties and fees for the distribution rights to television, radio and film. The IMF treats distribution rights to television, radio and film as being part of personal, cultural and recreational services, while New Zealand treats them as part of royalties and licence fees.</p> <p>The following analysis includes royalties and licence fees from software only.</p>

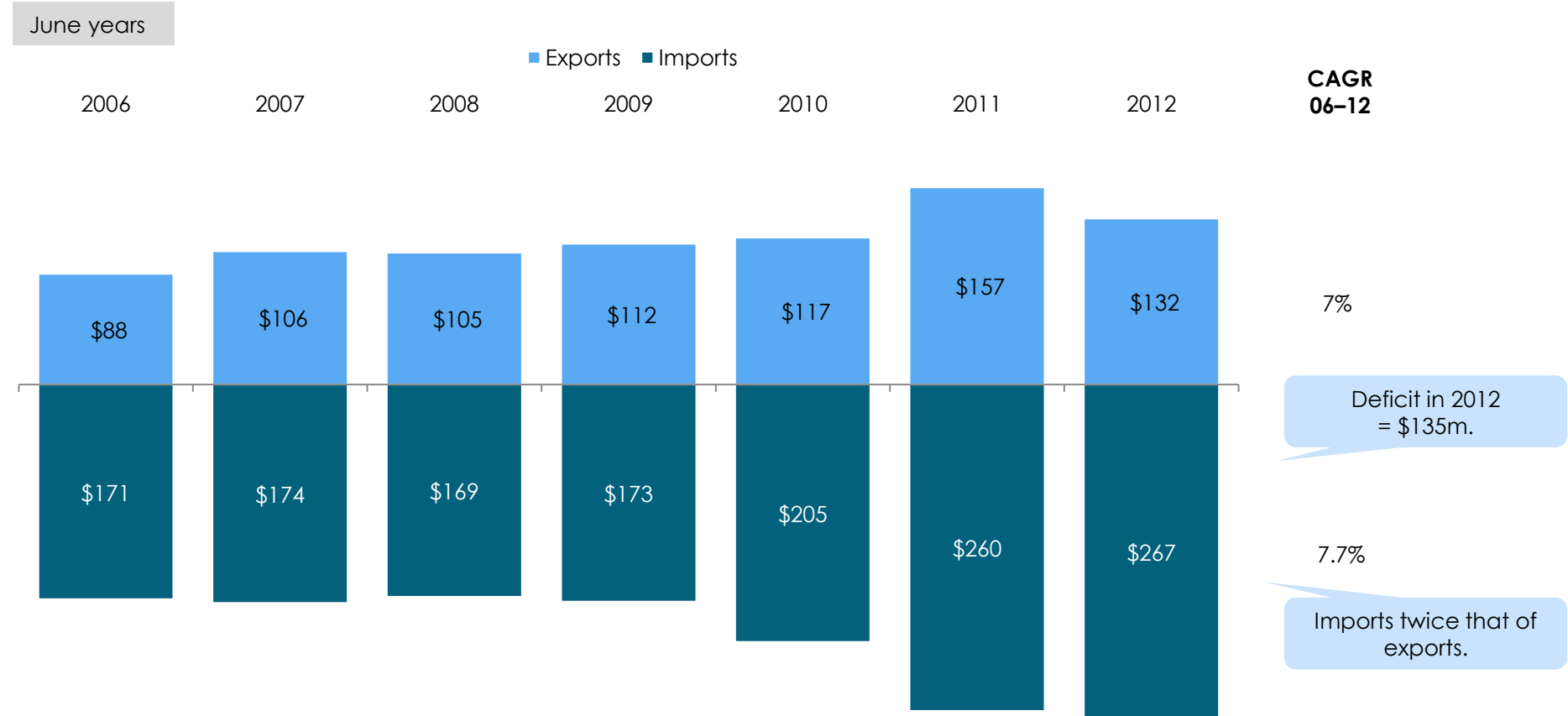
Comment
<p>When exports were just about shipping frozen lamb or bags of milk powder on ships, determining their value was a simple matter. Determining the true value to the New Zealand economy of firms such as Xero or Diligent Board Member Services in terms of export income, value creation and profits from overseas subsidiaries is a complex matter and beyond the scope of this report.</p> <p>Instead it is assumed that the above two categories are representative of the export performance of the sector. It is possible, however, that the data understates the true value.</p>

Trade balance: royalties and licence fees received for software

New Zealand pays twice as much in royalties and licence fees for imported software as it receives from exported software

Royalties and licence fees received for software; exports versus imports

NZ\$m; 2006–2012

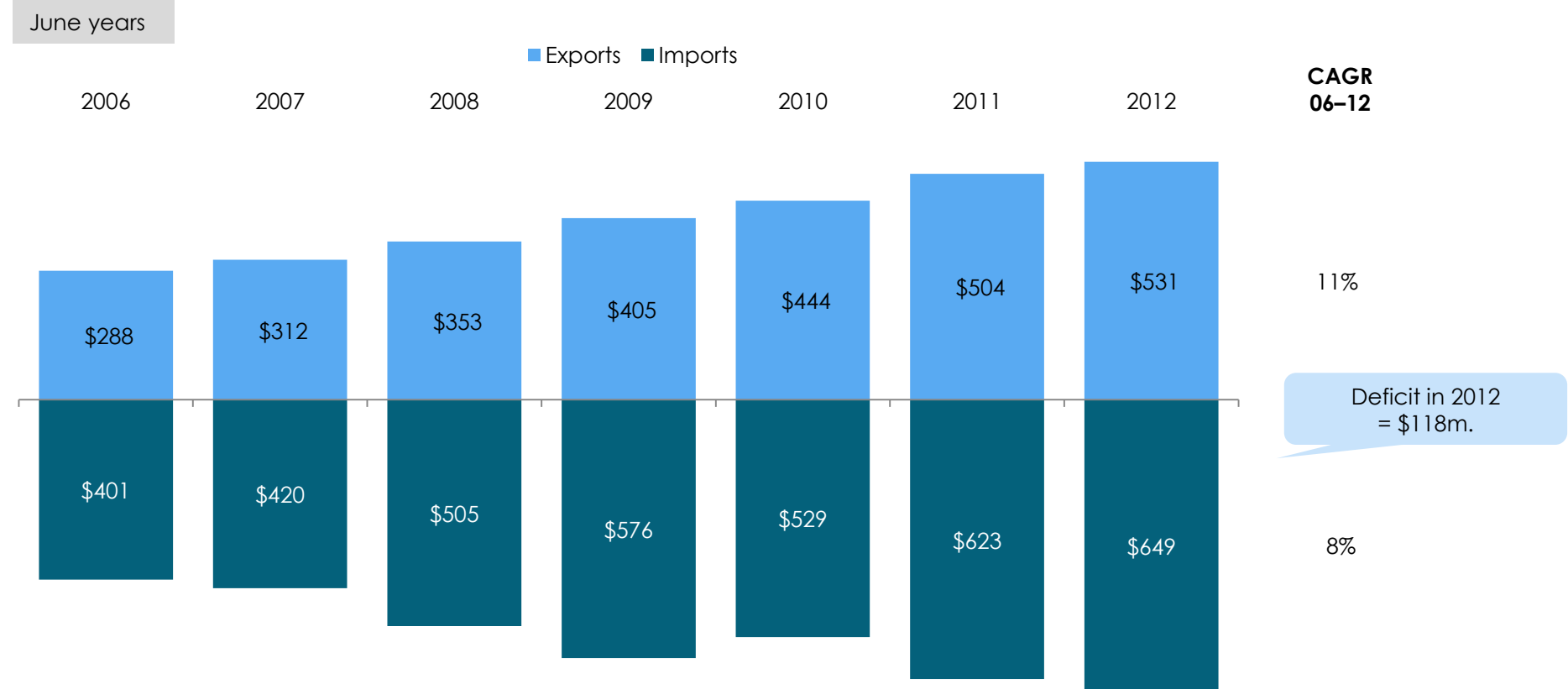


Trade balance: computer and information services

Exports of computer and information services have grown faster than imports

Computer and information services: exports versus imports

NZ\$m; 2006–2012

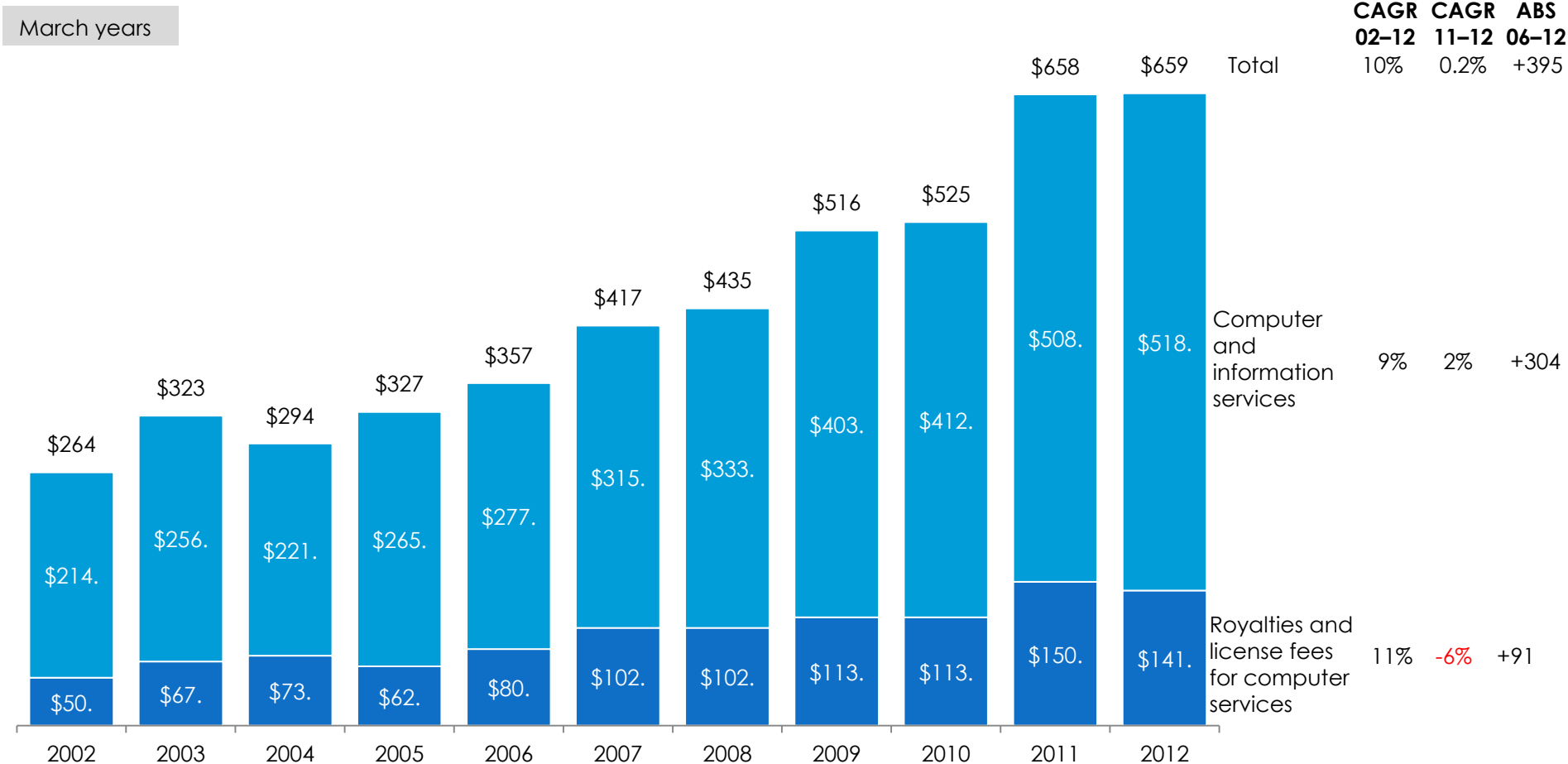


Export growth

Exports of IT services have grown at 10% per annum since 2002, driven by computer and information services

IT services exports by category

NZ\$m; 2002–2012



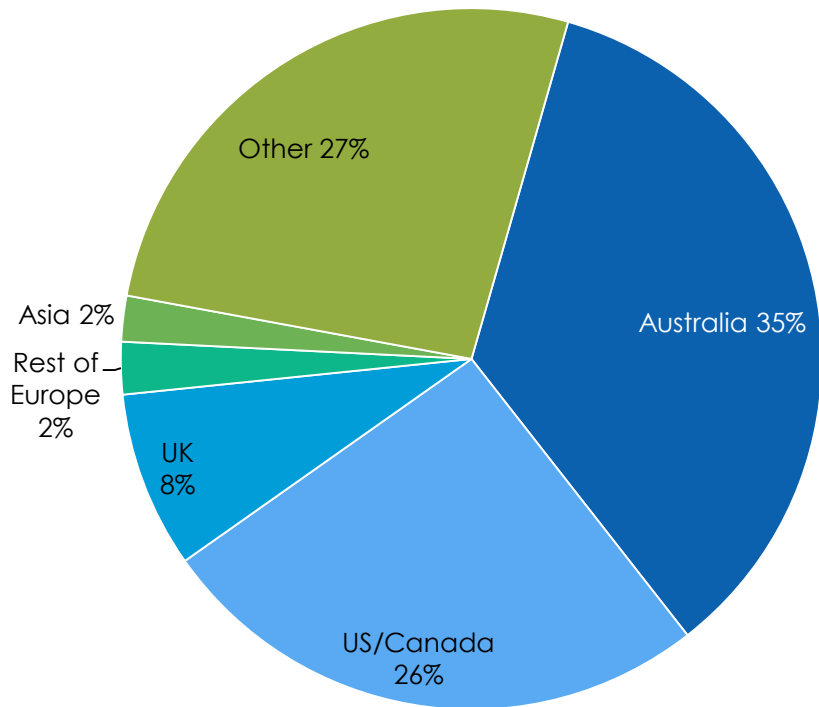
Export markets

Traditional (typically English speaking) markets account for 69% of exports

IT services exports by market

% market; 2012

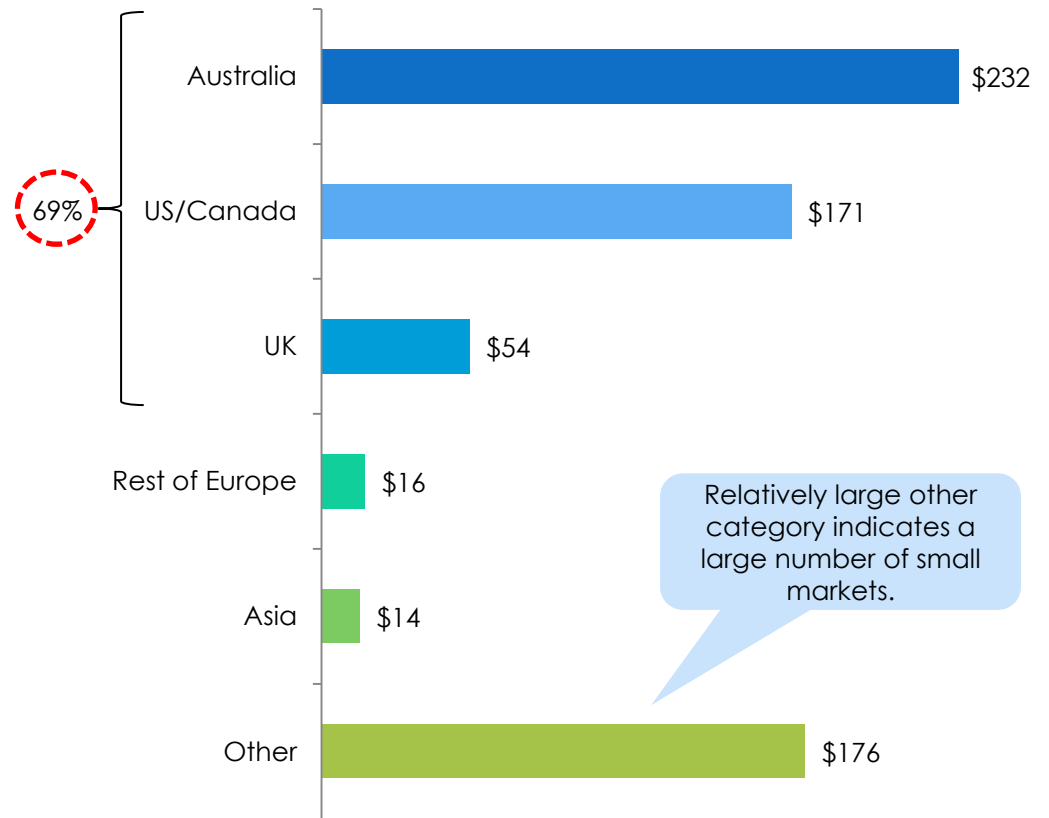
June years



Total = \$663m (2012)

IT services exports by market

NZ\$m; 2012



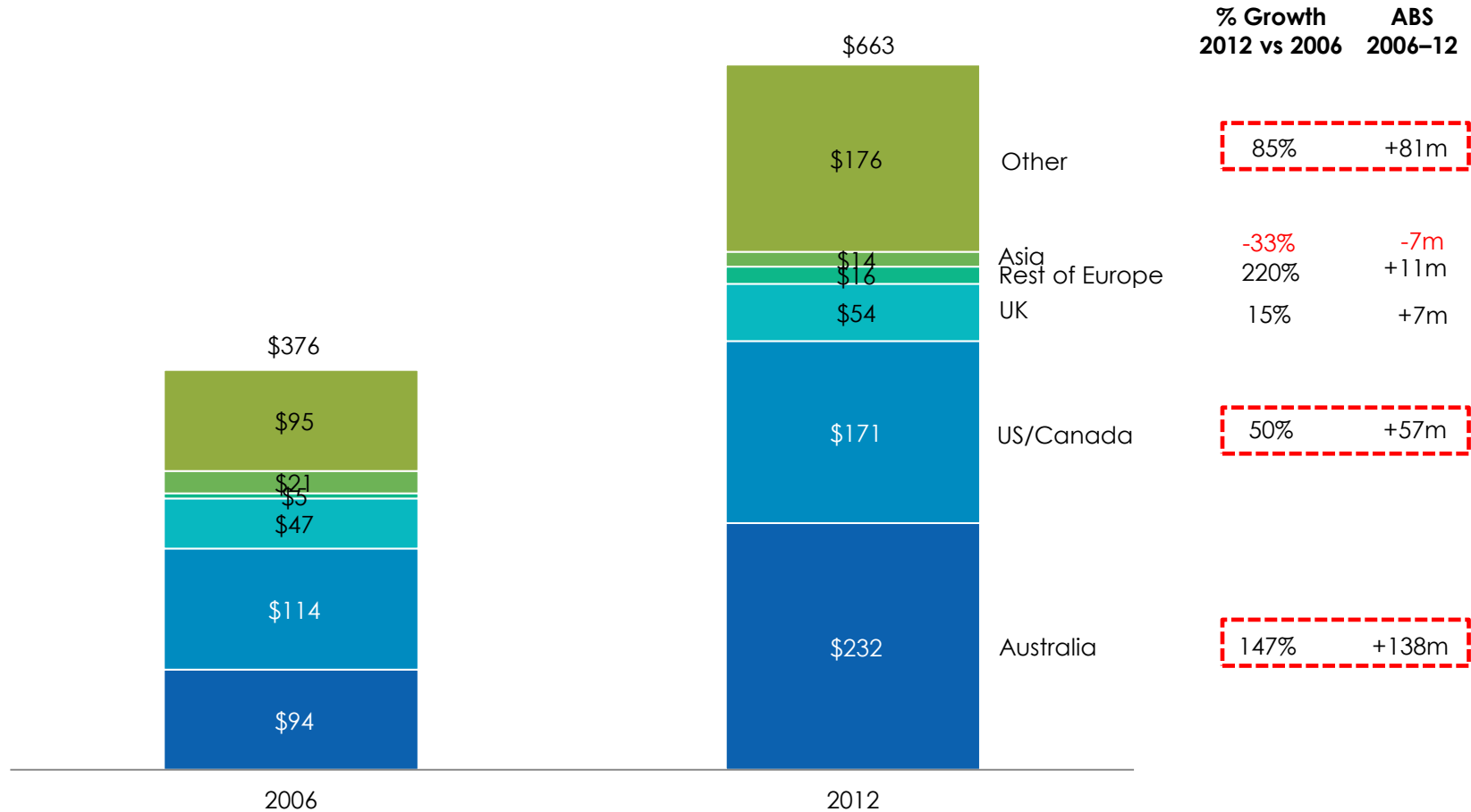
Relatively large other category indicates a large number of small markets.

Export growth by market

Australia, US/Canada and 'other' have driven export growth

IT services exports by major market

NZ\$m; 2006 & 2012

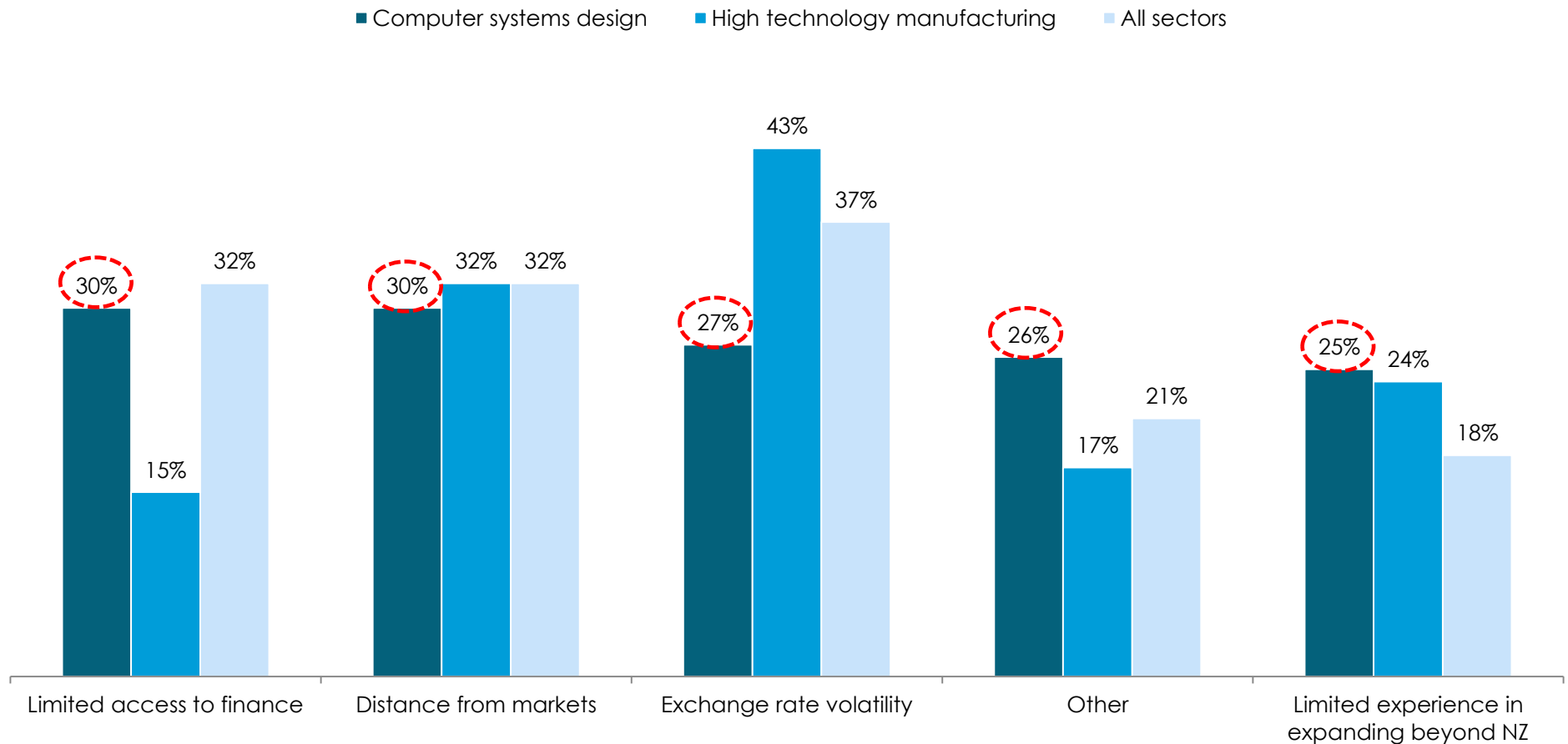


Barriers to exporting for existing exporters

Access to finance and distance are the top barriers; exchange rate is less of a barrier than for other sectors

Number of exporting firms reporting the following factors as barrier to exporting

% exporting firms; 2011



Weightless exports

Weightless exports are not costless; firms exporting software and services typically need a presence close to customers

Overseas offices: selected IT product firms

Firm & revenue	Overseas offices / representation
Orion Healthcare (Revenue: \$100m est)	North America, 5; Asia-Pacific (excluding NZ), 6; Europe/UK, 3; Middle East, 1
Xero (Revenue: \$40m est)	Melbourne, Brisbane, San Francisco, Milton Keynes
SLI Systems (Revenue \$16m est)	Melbourne, London, San Jose
Wherescape (Revenue, \$15m est)	Oregon, USA. Reading, UK
Diligent Board Member Services (Revenue: \$44m est)	United States, United Kingdom, Australia, Singapore, Canada, the Netherlands and Hong Kong
Information Tools (Revenue, \$27m est)	UK, USA, Argentina, Sweden, Bangladesh, Netherlands, Belgium, Ireland, Germany, Japan, South Africa, Australia (some of these may be in-market partners)
BankLink (Revenue, \$42m est)	Sydney, London
Pingar (Revenue, \$4m est)	California, UK, India, Hong Kong

Weightless exports: industry comment

- *Our market basically is completely off-shore. Ninety per cent of our revenue is from the US, but we do have customers in Europe and are chasing a few in Asia. Our chief executive has spent most of the last three years in the US. You have to educate the market on how to use our product. You've got to be there to get wins. You can't do that remotely. It's only really in the last six months that we've got the funding to start building the team on the ground there.*
 - Executive, small IT product business
- *'Weightless' is a bit of a misnomer. There is a substantial cost overseas incurred in delivering your products and services to customers. Yes, you don't have to pay for a ship. But you can't sit in New Zealand and sell and support your products entirely over the Internet. Delivering software over the Internet is weightless, but it would be very rare that that was all that was involved. Normally you have to have people conducting sales in market and providing after-sales support and maintenance. Customisation, though, can be brought back to New Zealand.*
 - Partner, technology law firm
- *I don't see in any way that people are going to value knowledge less in years to come. And I don't see any way that new technologies are going to eliminate the incredible value of being right there... there is a huge amount of evidence to suggest that in many cases face to face contact and electronic technologies are compliments rather than substitutes. If you look at actually when people call each other, they are more likely to call each other if they are physically close to each other. The most famous example of geographic concentration in the world today is the highest tech industry with the biggest ability to actually connect electronically – Silicon Valley. So its very hard to make a case from the evidence that e-technologies are going to make in any sense face-to-face contact obsolete, and there are a lot of things to suggest it's going to create a more interactive, more urban world.*
 - Edward Glaeser, Fred and Eleanor Glimp Professor at the Department of Economics, Harvard University, London Schools of Economics Public Lecture podcast, 14 March 2011



TELECOMMUNICATIONS

Telecommunications

Telecommunications is made up of five sub-sectors covering a range of activities (e.g. wired versus mobile networks)

Sub-sector	Description	ANZSIC code	Example firms
Wired telecommunications network operation	Firms engaged in: <ul style="list-style-type: none"> • international telephone network operation (wired) • local telephone network operation (wired) • long distance telephone network operation (wired) • telecommunications network operation (wired) 	J5801	Chorus
Other telecommunications network operation	Firms engaged in: <ul style="list-style-type: none"> • mobile telecommunications network operation • satellite telecommunications network operation • wireless telecommunications network operation 	J5802	2Degrees
Other telecommunications services	Firms engaged in providing a range of other telecommunication services such as paging services and other specialised telecommunications applications. Also included are telecommunications resellers purchasing access and network capacity from telecommunication carriers	J5809	Callplus
Internet service providers and web search portals	Firms engaged in providing internet access services. Also included are firms which provide web search portals used to search the Internet	J5910	Inspire.net
Telecommunication goods wholesaling	Firms mainly engaged in wholesaling telecommunication goods, e.g. mobile phones; communications equipment, electric cable ducting systems, telephone accessories etc	F3493	Atrax Group

Telecommunications: example firms

The sector is dominated by a few large companies with a number of smaller providers

Brief profile of selected firms in the telecommunications sector

2012 or as available

Firms	Revenue	Number of employees	Ownership	Description
Telecom	\$4,576m*	6948	Listed (NZX)	Full range of telecommunications services
Vodafone	\$1620m*	1938	Listed (LSE; NASDAQ)	Full range of telecommunications services
Chorus	\$613m (7 months)*	2500	Listed (NZX)	Own and manage the local telephone exchanges, cabinets and copper and fibre cables
Kordia	\$399m*	784	NZ Government	Broadcasting transmission and telecommunications services
Alcatel-Lucent	\$236m**	600	Listed (Euronext; NYSE)	Provider of telecommunications solutions and equipment
2Degrees	\$185m	300	NZ/Foreign	Mobile telecommunications
Citylink	\$8.2m**	32	NZ private	Telecommunications services and broadband connectivity
Farmside	\$21m (est)	80	NZ private	Satellite telecommunications network operator

Telecommunications: number of firms by sub-sector

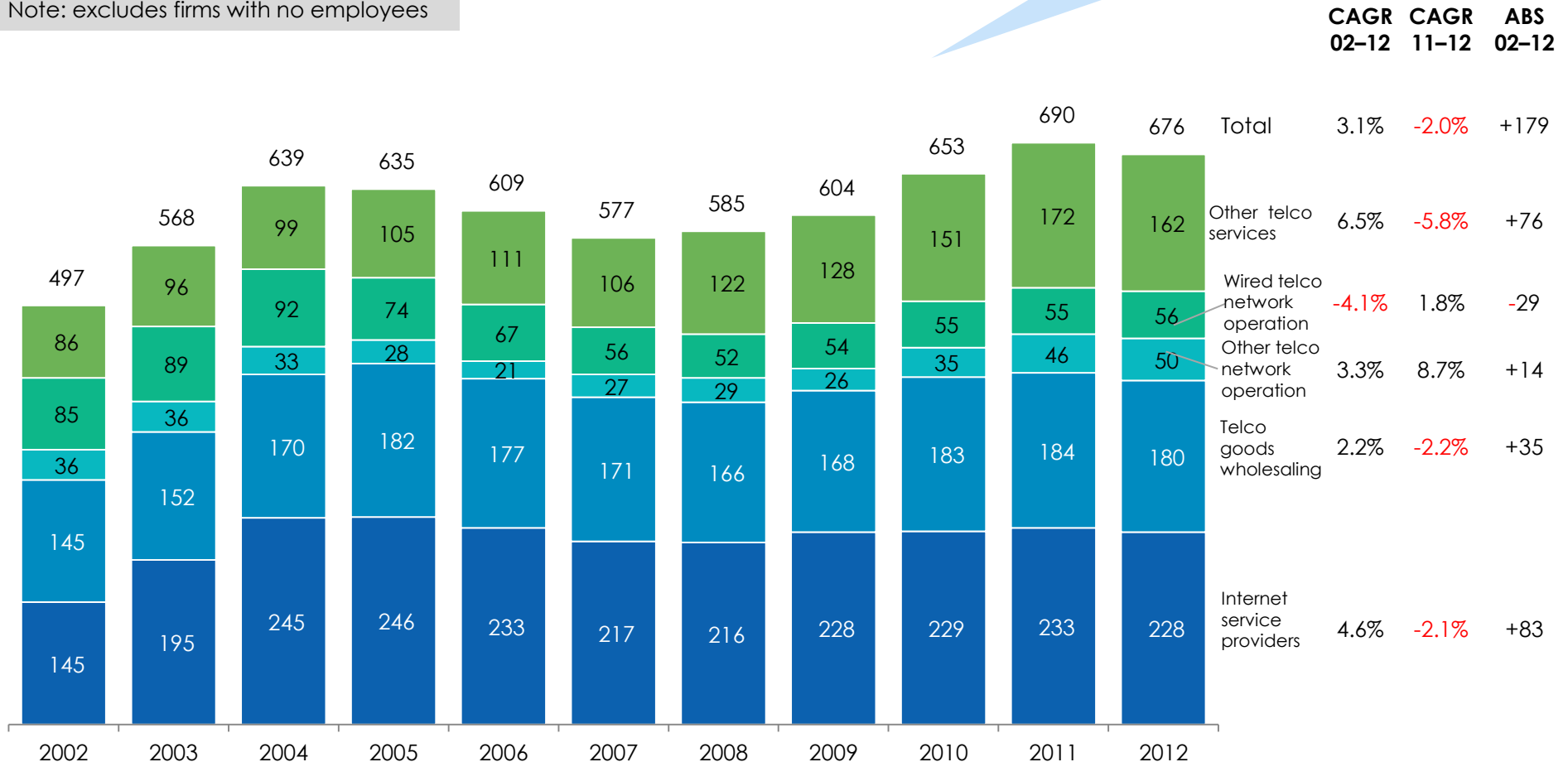
The number of telecommunications firms is growing, apart from 'wired telecommunication network operation'

Number of telecommunications firms by sub-sector

Firms; 2002–2012

Note: excludes firms with no employees

Growth in 'other services' likely to be driven by innovative services / resellers

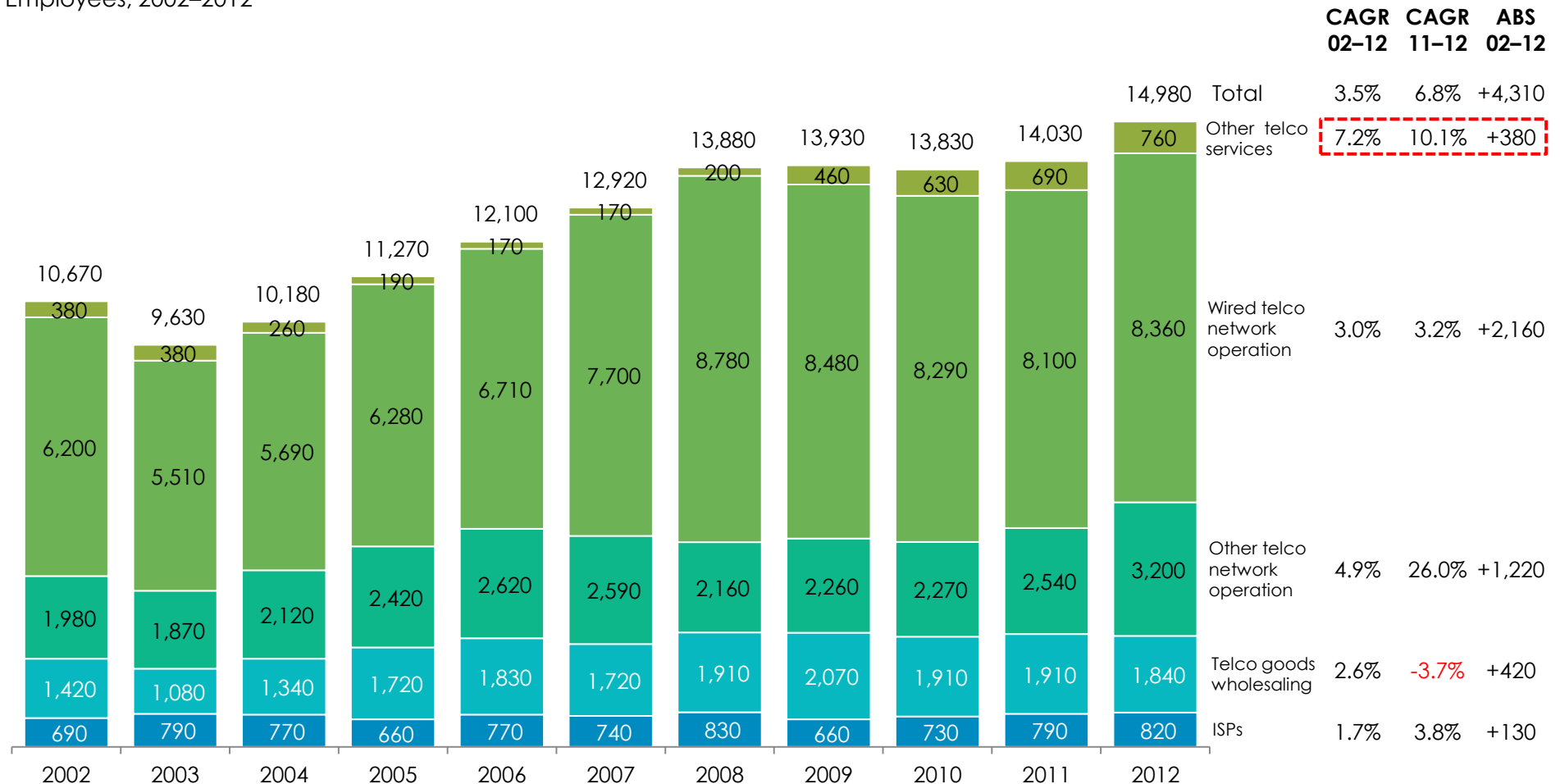


Telecommunications: number of employees by sub-sector

Following four years of no growth, employment grew in 2012 driven by 'other telecommunications network operation'

Number of telecommunications employees by sub-sector

Employees; 2002–2012



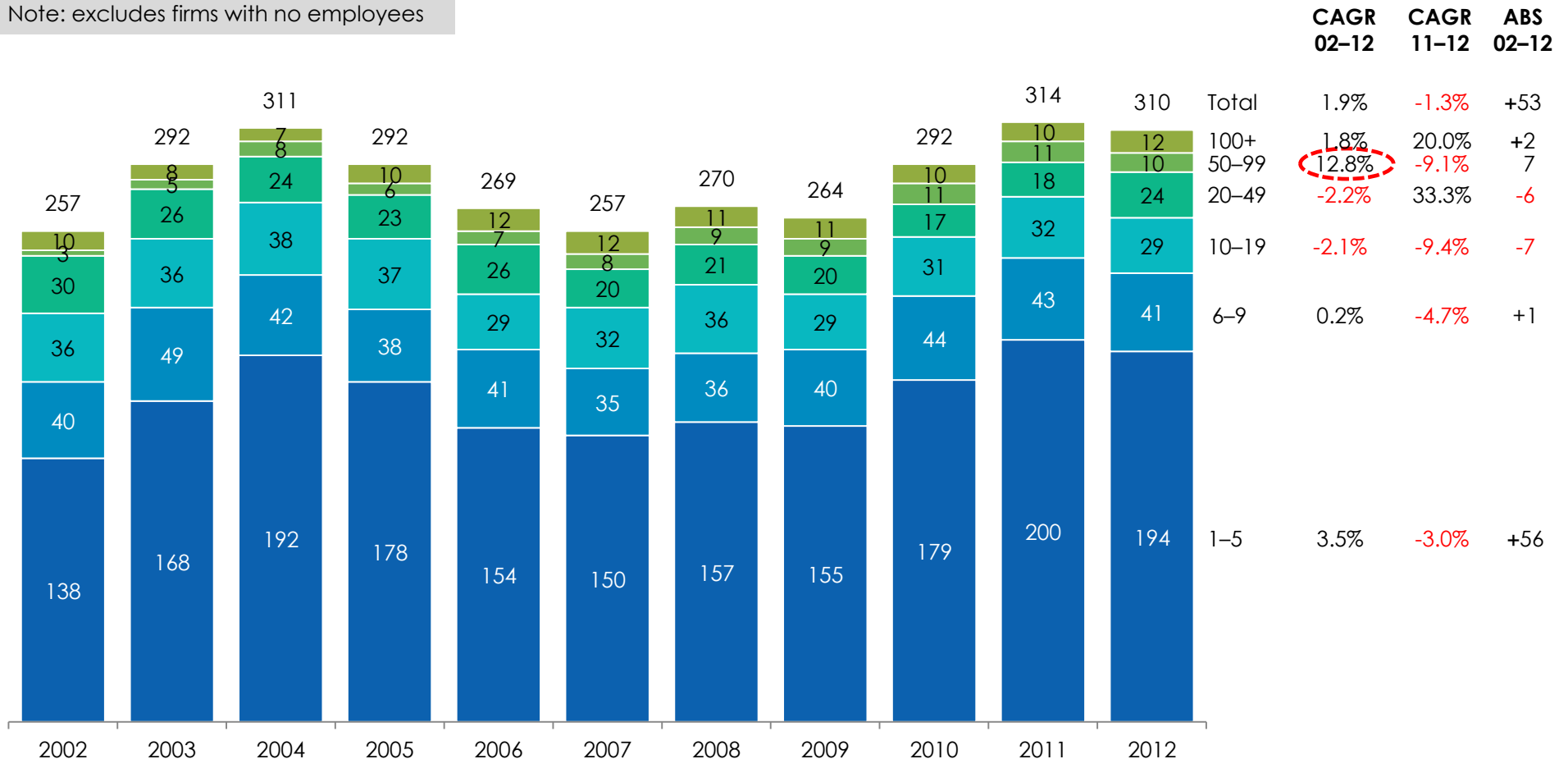
Telecommunications: number of firms by size

The number of large firms has remained stable for a decade, with growth in firm numbers driven by small firms

Number of telecommunications sector firms by size

Firms; 2002–2012

Note: excludes firms with no employees

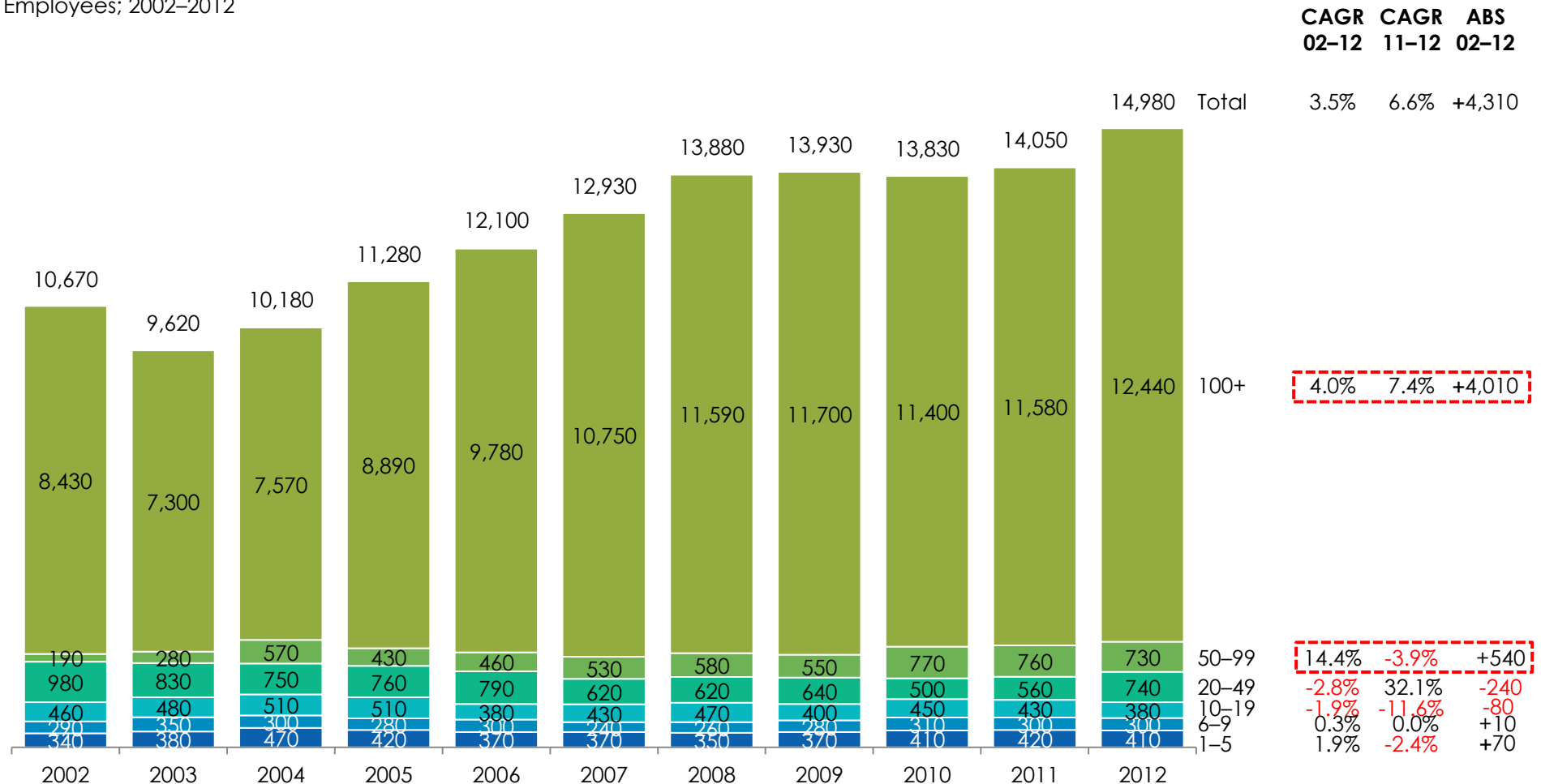


Telecommunications: employment by firm size

Large firms account for three-quarters of employment and have driven employment growth

Number of telecommunications sector employees by firm size

Employees; 2002–2012



Note: Statistics New Zealand Business Demographics database (excludes department stores)



THE DIGITAL ECONOMY

Impact of Moore's Law

New applications are driving disruptive change in social and economic activities

- *Computer power is getting bigger and cheaper at rates that are really hard to wrap your mind around. Moore's Law says that computing power essentially doubles every 18 to 24 months, and you think 'I can get my mind around doubling'. When you do that 10, 20 times, our minds can't picture that kind of exponential growth.... What's different now is that each doubling is on a much larger base than before... A huge underappreciated force and one that's getting bigger all the time... is the astonishing abilities that computers and robots are now demonstrating, that were the stuff of science fiction even 10 years ago.*
 - Andrew McAfee, Principal Research Scientist, MIT Centre for Digital Business, interview on GlobalBiz, BBC podcast, 30 March 2013
- *In 2004 we used to teach a book that had a set of technologies that humans could do well and a set of technologies that machines could do well. The canonical example they gave, that humans could do well and machines could not, was driving a truck. There was just too much real time information coming in. There are no formal rules.... I was teaching my students as recently as 2005 that that was something machines just weren't going to be able to do anytime soon.*
 - Andrew McAfee, Principle Research Scientist, MIT Centre for Digital Business, interview on GlobalBiz, BBC podcast, 30 March 2013
- *With digitisation, the change that can happen in all industries is massive.... We have a rare transition happening right now. Not all generations get to live through a radical transformation. Most get to optimise current assumptions. And I believe the biggest challenge for management is that you need to radically challenge existing assumptions, because otherwise what you are doing is creating incremental improvement. And if you see what happened to the music industry, and if you see what's happening in the other extreme, in mining, these are not incremental. These are pretty radical adjustments to business models.*
 - Jim Hagemann Snabe, co-Chief Executive, SAP, London School of Economics Public Lecture, 21 February 2013
- *Part of the technology change related to microprocessor transistor counts, is the move to multicore and parallel processing. This involves a radical paradigm shift in software engineering for computer intensive applications (a rapidly growing area with image, sound and signal processing in particular, and now reaching handheld computing); this has major implications for computer programming education.*
 - New Zealand ICT industry specialist, 2013

The digital economy

ICT is driving change in every sector, as these examples show; arguably ‘every company is now a software company’*

Sector	Firm	Examples
Food and beverage	Fonterra	<ul style="list-style-type: none"> Fonterra's online auction Global Dairy Trade platform is changing the nature of price discovery. Fonterra's Crawford Street facility includes a high-tech cool store with automated stacking robots.
Mining	Rio Tinto	<ul style="list-style-type: none"> <i>Rio Tinto is to become the owner of the world's largest fleet of driverless trucks after it signed a deal to buy at least 150 from Komatsu Limited over the next four years... These 150 new trucks will work with our pioneering Operations Centre that integrates and manages the logistics of 14 mines, three ports and two railways.</i> – Rio Tinto website
Manufacturing and services converging	Tait Communications	<ul style="list-style-type: none"> Tait Communications reports that services now account for 25% of sales from services. Software is embedded in products. <i>We are still fixated on this manufacturing versus services distinction, and if you look at what manufacturing does... it does these designs, it writes this software, it invests in these new business processes. All of which you might regard as service activity . The boundaries between these two industry activities are getting very blurred.</i> – Jonathan Haskel, Professor of Economics at Imperial College Business School, London, interview on Peter Day's <i>In Business</i>, BBC podcast, 4 April, 2013
Media	TVNZ Sky TV	<ul style="list-style-type: none"> <i>The popularity of TVNZ Ondemand continues to go from strength to strength with video streams up a massive 41 per cent year-on-year in 2012. In 2012 the most watched programme on TVNZ Ondemand was home-grown soap Shortland Street, achieving more than 4.9 million streams.</i> – press release, TVNZ, 26 February 2013 Coliseum Sports Media is set to deliver to New Zealanders all 380 games of the English football Premier League via an online platform after out-bidding Sky TV for the rights.
Retailing	All retailers	<ul style="list-style-type: none"> A Roy Morgan poll found that 65 per cent of people over 14 bought something online in December 2012 – nzherald.co.nz, 4 April 2013. <i>Online sales are changing retailing. The Internet has revolutionised completely everything... retail has got to become a really sophisticated animal.</i> – retired fashion designer Ashley Fogel, Radio NZ interview, 2012
Agriculture	Re Gen Ltd	<ul style="list-style-type: none"> <i>Re Gen technology takes farm level data on key variables such as rainfall and soil and continuously sends this information through the Internet to a central database. The Re Gen solution synthesises thousands of individual measurements, best practice guidelines, regional council regulations and farm-specific limitations into a simple daily text message, providing a recommendation to the farmer to guide effluent irrigation.</i> – www.regenerated.co.nz

ICT occupations

There are 18 occupations classified as ICT; many ICT workers are employed in other sectors in the economy

ICT occupations

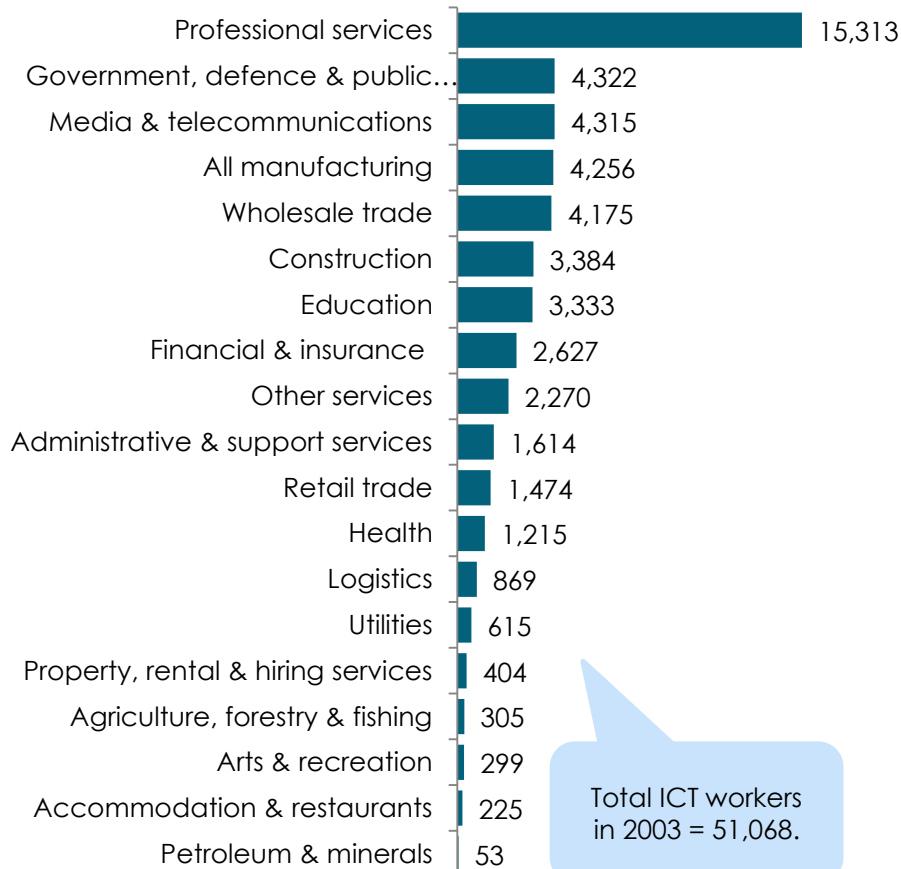
- ICT Managers
- ICT Trainers
- ICT Sales Professionals
- Web Designers
- Electronics Engineers
- ICT Business and Systems Analysts
- Multimedia Specialists and Web Developers
- Software and Applications Programmers
- Database & Systems Administrators & ICT Security
- Computer Network Professionals
- ICT Support and Test Engineers
- Telecommunications Engineering Professionals
- Electronic Engineering Draftspersons, Technicians
- ICT Support Technicians
- Telecommunications Technical Specialists
- Electronics Trades Workers
- Telecommunications Trades Workers
- ICT Sales Assistants

Total ICT workers by New Zealand sector, 2003 versus 2012

The economy has added 11,184 workers in ICT occupations since 2003; a third are employed in the professional services sector

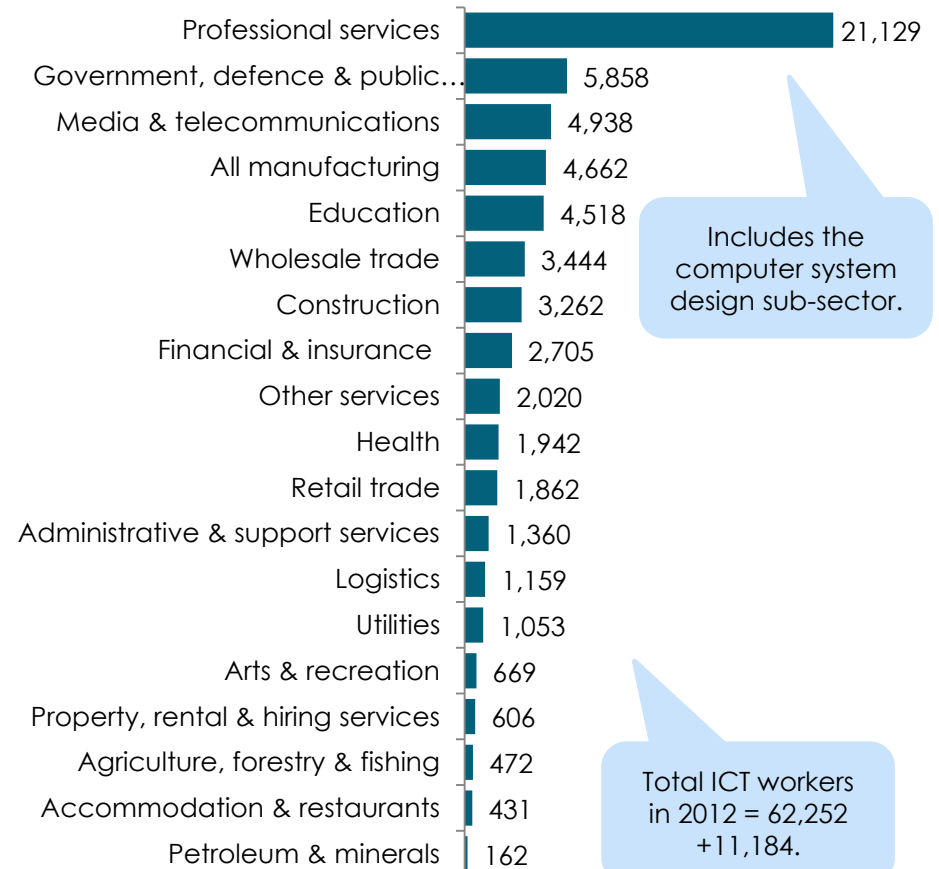
Number of workers in ICT occupations by sector

ICT workers; 2003



Number of workers in ICT occupations by sector

ICT workers; 2012

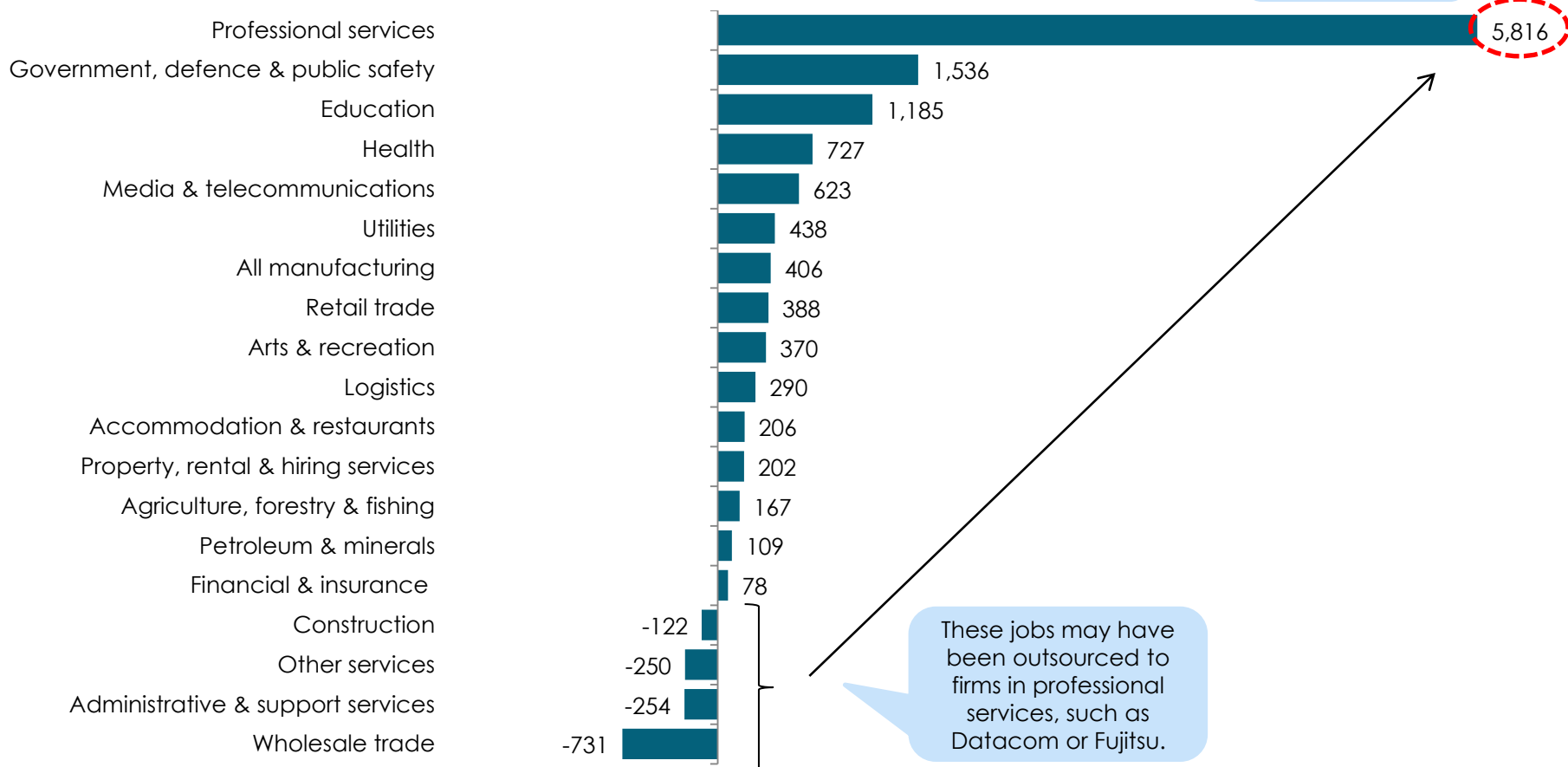


Absolute change in ICT jobs by sector, 2003–2012

The professional services sector accounted for 52% of growth in ICT jobs; wholesale trade reduced its ICT workforce

Absolute change in number of workers in ICT occupations by sector

ICT workers; 2003–2012

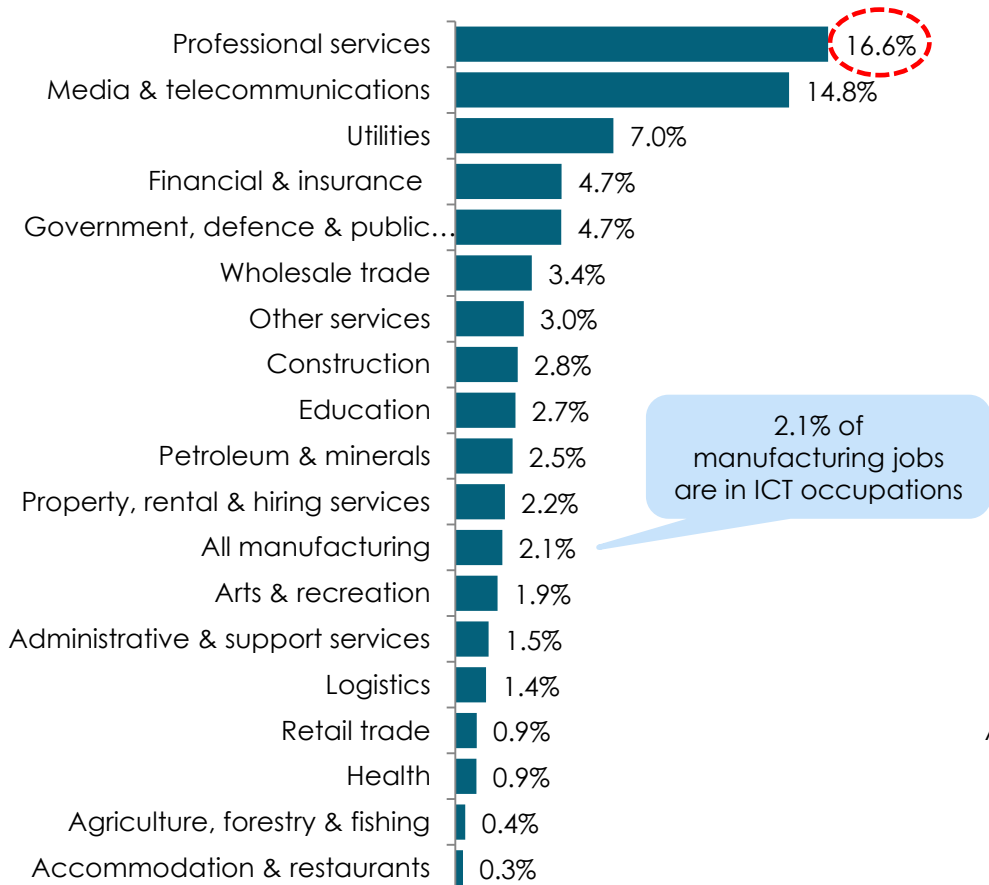


ICT workers as a percentage of total sector workforce

Professional services is the most ICT job intensive sector; proportion of ICT jobs in media and telecommunications increased by 4%

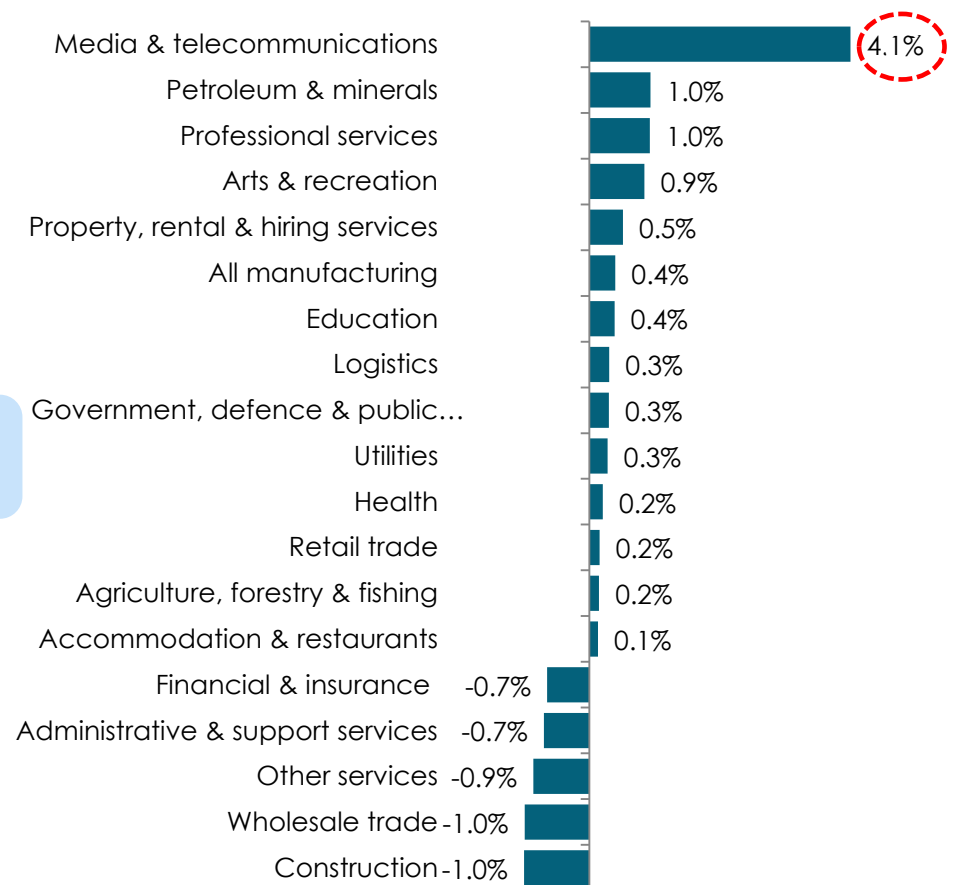
ICT workers as a % of total sector workforce

% ICT workers; 2012



Change in ICT workers as a % of total sector workforce

% ICT workers; 2003–2012



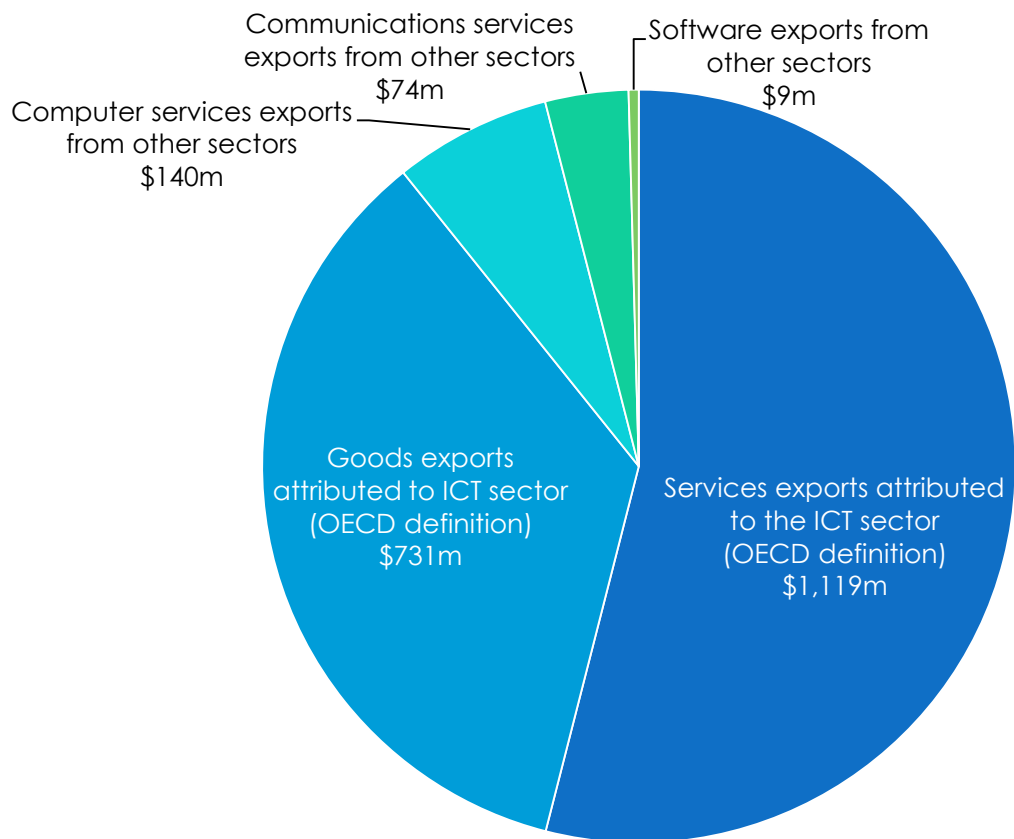
Source: Detailed Employment Estimates, MBIE analysis, calculated from the Household Labour Force Survey and the Linked Employer-Employee Data and historical censuses.

Digital economy exports

Exports attributed to the digital economy are between \$1 and \$2b, depending on the definition

Digital economy exports by ICT sector and all other sectors

Exports, NZ\$m, 2012



Total exports = \$2,073m

Treat as illustrative

Includes goods exports from those high technology firms also classified as ICT manufacturers.

Includes communications exports.

Excludes some categories that may include revenues derived from digital products, e.g. royalties.

Many non-IT firms may export IT services or software, e.g. manufacturers (Framecad and Tait Communications are examples).

This total double counts exports from other sectors, so is not additional.

In terms of the digitisation of economic activities, all exports will be ICT enabled in one form or another, e.g. through RFID tags, tracking, logistics, electronic payments systems.



APPENDIX

glossary, terms, definitions, sources and limitations

Glossary of terms

This report uses the following acronyms and abbreviations

A\$/AUD	Australian dollar	NZ	New Zealand
ABS	Absolute	n/a	Not available/not applicable/no data
ANZSIC	Australia and New Zealand Standard Industry Classification	NZ\$/NZD	New Zealand dollar
AR	Annual report	Oceania	NZ, Australia & Pacific Islands
ASEAN	Association of Southeast Asian Nations	RoE	Return on equity
AU	Australia	R&D	Research & Development
Australasia	Australia and New Zealand	S Asia	South Asia (Indian sub-continent)
b	Billion	SE Asia	South East Asia
CAGR	Compound annual growth rate	SOE	State Owned Enterprise
C/S America	Central and South America (Latin America)	T/O	Turnover
CRI	Crown Research Institute	US/USA	United States of America
CY	Calendar years	US\$/USD	United States Dollar
E. Asia	East Asia	UK	United Kingdom
EBITDA	Earnings before interest, tax, depreciation and amortisation	YE	Year ending
FTE	Full-time equivalent	YTD	Year to date
FY	Financial year		
GFC	Global financial crisis		
JV	Joint venture		
m	Million		

ICT definition

OECD definition for information and communications technology (ICT)

The OECD definition includes telecommunications goods and services, but excludes internet publishing and broadcasting. The ICT sector is defined as:

- goods and services which enable the function of information processing and communication by electronic means including transmission and display
- goods which use electronic processing to detect, measure and/or record physical phenomena or control a physical process.

Applying the OECD's definition, the four industries below are classified as part of the ICT sector.

Note: how statisticians define the industry and how the industry sees itself may be very different.

ANZSIC code*	Description	New Zealand examples
Telecommunications		
J580100	Wired telecommunications network operation	Chorus
J580200	Other telecommunications network operation	2Degrees
J580900	Other telecommunications services	CallPlus
J591000	Internet service providers and web search portals	Inspire.net
F349300	Telecommunication goods wholesaling	Atlas Gentech
IT services (software and computer services)		
L663900	Other goods and equipment rental and hiring not elsewhere classified	Vidcom New Zealand
M700000	Computer system design and related services	Orion Health
J542000	Software publishing	Pingar
J592100	Data processing and web hosting services	Revera
J592200	Electronic information storage services	Paymark
S942200	Electronic (except domestic appliance) and precision equipment repair and maintenance	Kinetics Group Ltd
ICT manufacturing		
C242100	Computer and electronic office equipment manufacturing	Smartrak
C243100	Electric cable and wire manufacturing	General Cable Superconductors
C242900	Other electronic equipment manufacturing	Rakon
C242200	Communication equipment manufacturing	Tait Communications
C241900	Other professional and scientific equipment manufacturing	Atrak Group
IT wholesaling (Mainly importers, equipment providers)		

*Australia & New Zealand Standard Industrial Classification 2006 (ANZSIC).

Source: Statistics NZ; OECD definitions (ISIC 3.1 version)

Computer system design definition

This report uses the Australian and New Zealand Standard Industrial Classifications (ANZSIC)* definition of computer system design

Formal name: Computer system design and related services
ANZSIC code: M7000

This classification captures enterprises mainly engaged in providing expertise in the field of information technologies such as writing, modifying, testing or supporting software to meet the needs of a particular consumer; or planning and designing computer systems that integrate computer hardware, software and communication technologies.

Primary activities

- Computer hardware consulting service
- Computer programming service
- Computer software consulting service
- Internet and web design consulting service
- Software development (customised) service (except publishing)
- Software installation service
- Systems analysis service

Caveat

For the purposes of this report it is assumed that software-as-a-service businesses (for example) are captured in this classification. In any case, as the largest IT subsector, it is assumed that the data is representative of the structure and dynamics of New Zealand's cohort of IT firms.

Exclusions

The following activities are not included in this classification:

- mass producing computer software (included in Class 1620 Reproduction of Recorded Media)
- leasing or hiring electronic computers or other data processing equipment (included in Class 6639 Other Goods and Equipment Rental and Hiring not elsewhere specified)
- computer software publishing (included in Class 5420 Software Publishing)
- providing data processing services or computer data storage and retrieval services (included in the appropriate classes of Group 592 Data Processing, Web Hosting and Electronic Information Storage Services).

Terms and definitions

The report uses the following economic metrics

Term	Definition	Comment
Nominal GDP (gross domestic product)	The value of goods and services produced in New Zealand, after deducting the cost of goods and services used in the production process. 'Nominal' means not adjusted for inflation.	Cross-cutting sectors (excluding tourism) Value added has been used to provide indicative estimates. These have not been verified through the System of National Accounts.
Real GDP (gross domestic product)	GDP adjusted to remove the effect of price changes/inflation to show the change in the volume of goods and services produced in New Zealand. In this report, it is expressed in constant 2010 prices.	Cross-cutting sectors (excluding tourism) Data not available.
Goods exports	The value of goods of domestic origin (excluding re-exports) exported from New Zealand to another country. Note: sector exports values will exclude items suppressed in accordance with Statistics NZ's confidentiality policy. Exclusions are noted where applicable.	All sectors: Merchandise (goods) exports have been obtained by matching commodities to the ANZSIC06 industry that characteristically produces them (Statistics NZ custom job).
Employment	The number of people who earned money from employment (wages and salary earners) and/or self-employment. For tourism it is full-time equivalent (FTE) employees producing goods and services sold directly to tourists.	Cross-cutting sectors (excluding tourism) Statistics NZ, Linked Employee Employer Database (LEED), (custom job). Tourism Direct employment in tourism (FTEs) and employment (FTEs) in tourism as a % of total.
Productivity	A measure of how efficiently inputs are used within the economy to produce outputs. Productivity is calculated by dividing the sector's real GDP by the number of hours paid. Real GDP per hour paid is used. For the cross-cutting sectors nominal GDP per employee is substituted.	Cross-cutting sectors (excluding tourism) For cross-cutting sectors real GDP is replaced by nominal GDP, and hours paid is replaced by number of employees; hence calculation is nominal GDP by number of employees.
Investment in fixed assets (gross fixed capital formation)	A measure of the outlays of producers on durable fixed assets (e.g. buildings, vehicles, plant and machinery, hydro-electric construction, roading and improvements to land). 'Gross' indicates that consumption of fixed capital is not deducted from the value of the outlays.	Cross-cutting sectors (excluding tourism) Uses additions less disposals of fixed assets, (custom job). Note: this data has not been through the System of National Accounts, so is indicative only.
Number of firms (number of enterprises)	The number of businesses or service entities operating in the sector in New Zealand. It covers all types of business or service entities, including companies, self-employed individuals, voluntary organisations and government departments.	Cross-cutting sectors (excluding tourism) Uses customised Business Demography Statistics, number of enterprises.

Terms and definitions

The report uses the following financial metrics

Term	Definition	Comment
Total income per firm	Total income of all firms in sector divided by the number of firms in the sector. Income includes sales, interest, dividends, donations, government funding, grants and subsidies, and non-operating income.	Cross-cutting sectors (excluding tourism) Statistics NZ, Annual Enterprise Survey statistics, custom job.
Total income per employee:	Total income of all firms in sector divided by rolling mean employment. Total income includes sales, interest, dividends, donations, government funding, grants and subsidies, and non-operating income.	Cross-cutting sectors (excluding tourism) Statistics NZ, Annual Enterprise Survey statistics, custom job.
Surplus per employee:	Surplus before income tax of all firms in sector divided by rolling mean employment.	Cross-cutting sectors (excluding tourism) Statistics NZ, Annual Enterprise Survey statistics, custom job.
Return on equity	Surplus before income tax divided by shareholders' funds.	Cross-cutting sectors (excluding tourism) Statistics NZ, Annual Enterprise Survey statistics, custom job.
Capital stock per worker	Indicates capital intensity. The capital stock includes fixed assets such as buildings, roads and machinery, and intangible items such as software and exploration expenditure, less accumulated depreciation.	Cross-cutting sectors (excluding tourism) Statistics NZ, Annual Enterprise Survey statistics, custom job. Tourism: Capital stock, divided by employment.
Debt ratio	Debt ratio equals total liabilities of all firms in sector divided by total assets of all firms in sector.	Cross-cutting sectors (excluding tourism) Statistics NZ, Annual Enterprise Survey statistics, custom job.

Sources: economic data

The following sources were used for economic data

Metric	Source Standard ANZSIC sectors	Source tourism	Source ICT
Nominal GDP	Statistics New Zealand, Infoshare Database, System of National Accounts 1993, SND, GDP(P), Nominal, Actual, ANZSIC06 industry groups (Annual–Mar).	Statistics NZ, Tourism Satellite Account: 2012, Table 1 Tourism expenditure by component, Direct tourism value added.	Statistics NZ, Value added estimates from customised Annual Enterprise Survey tables. Note: this data has not been through the System of National Accounts, so is indicative only.
Real GDP	Statistics New Zealand, Infoshare Database, National Accounts, System of National Accounts 1993, SND, GDP(P), Chain-volume, Actual, ANZSIC06 industry groups (Annual– k Mar). Adjusted so that 2010 real GDP = 2010 Nominal GDP. Does not incorporate revisions published by Statistics NZ in December 2012.	n/a	
Goods exports	Statistics NZ, merchandise exports, obtained by matching commodities to the ANZSIC06 industry that characteristically produces them. Note: sector exports values will exclude items suppressed in accordance with Statistics NZ's confidentiality policy. For more information, see http://www.stats.govt.nz/about_us/policies-and-protocols/trade-confidentiality.aspx		Statistics NZ, merchandise exports, obtained by matching commodities to the ANZSIC06 industry that characteristically produces them.

Sources: economic data *continued*

Metric	Source standard ANZSIC sectors	Source Tourism	Source ICT
Employment	Statistics New Zealand, Table Builder, Linked Employer-Employee Data (LEED) Tables (annual), Table 1.6: Main Earnings Source by Industry (NZSIOC).	Statistics NZ, Tourism Satellite Account: 2012, Table 4, Direct employment in tourism (FTEs) and Employment (FTEs) in tourism as a percentage of total. See http://www.stats.govt.nz/browse_for_stats/industry_sectors/Tourism/tourism-satellite-account-2012/tourism-employment.aspx for more information on the tourism FTE measure.	Statistics NZ, LEED custom job.
Productivity	Real GDP divided by hours paid. Hours paid data from Statistics NZ, Infoshare Database, Productivity Input Series – Industry Level (ANZSIC06) (Annual–Mar), Hours, Gross. Manufacturing hours paid for 2010 split into manufacturing sub-sectors using QES hours paid and rated back using productivity indexes from Statistics NZ.	Substituted nominal GDP per employee.	Substituted nominal value added/employment.
Investment in fixed assets	Statistics New Zealand, Infoshare database, System of National Accounts 1993 - SND, Series, GDP(E), Nominal, Actual, Asset type (Annual–Mar), Gross Fixed Capital Formation.	Statistics NZ, Tourism Satellite Account - TSA, Table: Gross Fixed Capital Formation by Asset Type and by Industry (ANZSIC06) (Annual-Mar). NB data only available for certain years up to 2009.	Statistics NZ, Additions less disposals of fixed assets from customised Annual Enterprise Survey tables. Note: this data has not been through the System of National Accounts, so is indicative only. The all sector total excludes some industries – see note page following.
Number of firms	Statistics NZ Table Builder, Business Demography Statistics, Detailed Industry for Enterprises, number of enterprises.	n/a	Customised Business Demography Statistics, number of enterprises.

Sources: financial data

The following sources were used for financial data

Metric	Source standard ANZSIC sectors	Source Tourism	Source ICT
Surplus per employee	Statistics NZ, Annual Enterprise Survey release, surplus per employee count. The all sector total excludes some industries. See note below.	n/a	Statistics NZ, Customised Annual Enterprise Survey data, surplus per employee count.
Return on equity	Statistics NZ, Annual Enterprise Survey release, return on equity. Total excludes some industries – see note below.	n/a	Statistics NZ, Customised Annual Enterprise Survey data, return on equity.
Debt ratio	Statistics NZ, Annual Enterprise Survey release, total liabilities (current and other) divided by total assets. The all sector total excludes some industries. See note below.	n/a	Statistics NZ, customised Annual Enterprise Survey data, total liabilities (current and other) divided by total assets.
Capital stock per worker	Statistics NZ, National Accounts (Industry Benchmarks): Year ended March 2010, Table 14 Net capital stock by industry, current prices (replacement cost), 1987–2010, divided by employment.	Statistics NZ, Tourism Satellite Account, capital stock, divided by employment. Note: capital stock data is only available for some years up to 2009 and does not incorporate the National Accounts revisions published in November 2012.	Substituted with fixed assets per worker from Statistics NZ, Customised Annual Enterprise Survey data, fixed tangible assets divided by employment. Note: the fixed assets data has not been through the system of National Accounts, so is indicative only. The all sector total excludes some industries - see note below.

Note: AES data excludes residential property operators, foreign government representation, religious services, private households employing staff and superannuation funds.

Business Operations Survey, 'example' firms and other sources

Business Operations Survey

The Business Operations Survey collects information on the operations of New Zealand businesses. This information is used to quantify business behaviour, capacity, and performance. The survey gives insights into business activities, barriers and motivations behind New Zealand business operations.

Data from the Business Operations Survey was used to calculate:

- barriers to innovation and exporting
- rates of innovation and R&D by sector
- the rate of outward direct investment and foreign direct investment by sector
- percentage of firms in a sector reporting overseas income

Size of business operations survey

The survey is run annually and typically information is collected from approximately 36,000 firms operating in New Zealand with six employees or more.

Customised data for the Sectors Report

Data for the cross-cutting sectors, information and communications technology, high technology manufacturing, tourism, knowledge intensive services and some of the manufacturing sectors was provided by Statistics NZ as a custom job. This data may be below the level the survey is designed for and so should be treated with caution.

Detailed information on the Business Operations Survey is available from the www.stats.govt.nz

Example firms: sources and limitations

The example firms are sourced from the Kompass database (quoted with permission) Management Magazine's top 200 firms (2012) plus various websites, annual reports and the TIN 100 publication (2012).

Firms allocated to sectors in this report may not match firms included in official statistics. Statistics NZ does not release firm level data. In most cases numbers employed and turnover quoted for example firms are estimates.

MBIE welcomes corrections to the example firms' data.

Other sources

Other data sources, such as the Comtrade database, are noted on the page on which they occur.

Exports by sector limitations

This report attributes exports to sectors by mapping products and services to the sector most likely to produce them

Classifying exports by sector

Statistics on exports are collected according to product or service type and not according to the sector that generates the exports.

Statistics New Zealand collects goods trade statistics using the New Zealand Harmonised System Classification 2012 (NZHSC). This is based on the World Customs Organization's (WCO) Harmonized Commodity Description and Coding System (HS).

Firms are classified into sectors using the Australia and New Zealand Industrial Classification (ANZSIC) system.

To obtain insight into the export performance of sectors for this report, Statistics New Zealand prepared a concordance that maps HS codes (how goods exports are classified) to ANZSIC codes (how sectors are classified).

This concordance allocates exports to sectors based on the **type of product the sector is most likely to produce**. Hence logs and fruit are attributed to the agriculture, forestry & fishing sector, while sawn wood products are attributed to the wood & paper sector, and milk powder and frozen beef are attributed to food & beverage manufacturing.

Treat with caution

The export data for sectors provided in this report is believed to be broadly correct, but should be treated with caution. The method used means that some sectors which clearly do export, have no or few exports allocated.

The clearest example is the wholesaling sector. Many wholesalers operating in New Zealand export products on behalf of the producers of those products, or purchase and on-sell them overseas. These exports are attributed to the sector that manufactured, grew, harvested or mined them, rather than to the wholesaling sector. Experimental data from Statistics New Zealand indicates that the value of goods exports by wholesale trade firms was around \$8b in 2011.

Services exports

Statistics New Zealand publishes services exports data by service type as part of its balance of payments statistics every quarter. These are calculated using a variety of different surveys and administrative data sources.

In this report, we have allocated exports of transportation, insurance and government services not included elsewhere to the logistics, finance & insurance, and government sectors respectively.

Commercial services by sector came from an industry breakdown from the Census of International Trade in Services and Royalties: Year ended June 2011 (not available for 2012).

There is no breakdown of travel exports by sector. Travel exports includes all spending on goods and services by non-resident visitors to New Zealand. It overlaps considerably with tourism exports (see below), but includes spending by international students here for more than a year as well as those here for up to a year (whereas tourism only includes those here for up to a year) and excludes tourists' international airfares (which are included in tourism, but are part of transportation exports in the Balance of Payments).



FURTHER READING

Further reading: information on the New Zealand economy

Publication	Available from
<p>The Regional Economic Activities Report, 2013 The Regional Economic Activity Report presents available official economic data on New Zealand's 16 regions. The report, which will be annual, provides regional economic information sourced from a number of government agencies.</p>	<p>www.mbie.govt.nz</p>
<p>Situation and Outlook for Primary Industries (SOPI) 2012 Published annually, this report provides up-to-date information about the performance of New Zealand's primary sectors – dairy, meat and wool, forestry, horticulture, arable and, for the first time, seafood – and gives independent forecasts of future prospects.</p>	<p>www.mpi.govt.nz</p>
<p>The Food and Beverage Information Project reports The project pulls together all the available information on the food and beverage industry into one place, in a form which is familiar and useful to business. Over 20 reports are available on every aspect of New Zealand's food industry, including information on export market and investment opportunities. New and updated reports are released annually.</p>	<p>www.foodandbeverage.govt.nz</p>



Further reading: the Government's Business Growth Agenda reports

Publication	Available from:
Building innovation The building innovation work stream of the Business Growth Agenda aims to grow New Zealand's economy by encouraging and enabling investment in research and development, and lifting the value of public investments in science and research.	www.mbie.govt.nz
Export markets The export markets work stream of the Business Growth Agenda aims to increase exports by New Zealand businesses, which is necessary to lift New Zealand's economic growth and living standards.	www.mbie.govt.nz
Building infrastructure The building infrastructure work stream of the Business Growth Agenda aims to provide the physical platform that will support sustained economic growth.	www.mbie.govt.nz
Natural resources The Building Natural Resources work stream of the Business Growth Agenda aims to make better use of New Zealand's abundant natural resources, so we can continue to grow our economy and look after our environment.	www.mbie.govt.nz
Skilled and safe workplaces The skilled and safe workplaces work stream of the Business Growth Agenda aims to improve the safety of the workforce and build sustained economic growth through a skilled and responsive labour market.	www.mbie.govt.nz
Building capital markets The building capital markets work stream of the Business Growth Agenda aims to ensure New Zealand has high performing capital markets that support investment, growth and jobs.	www.mbie.govt.nz

The Ministry of Business, Innovation & Employment (MBIE) welcomes comment and feedback on this report, and on the measures the Government is taking to facilitate the development of a competitive and successful ICT sector.
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