Service IQ

SMARTER PEOPLE FOR SMARTER BUSINESSES

A PROFILE OF THE

QUICK SERVICE RESTAURANTS SECTOR

IN NEW ZEALAND

2014

Infometrics for ServiceIQ

This report is one of 11 Sector Profile Reports that ServiceIQ has developed about the 11 sectors in our gazetted coverage area. These reports aim to give an overview of each sector with a focus on economic contribution, characteristics of the workforce, skills and training, opportunities and challenges facing the sector and projections of economic contribution and employment over the next five years. They will be used to inform ServiceIQ's industry and sector advisory groups and as an input into ServiceIQ's Service Sector Workforce Development Plan.

The Sector Profile Reports were prepared by Infometrics using data from official sources including the 2006 and 2013 Census, Business Demography, and GDP and modelling based on Infometrics' Regional Industry Occupation Model. These data sources were supplemented with desk research and qualitative information where available.

These reports should be considered alongside other pieces of work including detailed research on an individual sector, government strategies, and in-depth sector knowledge.

ServiceIQ anticipates updating these profiles on an annual basis and would like to include an increasing amount of sector-specific information as we become aware of it and as more is available.

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Table of contents

Executive summary

Key highlights

Approximately 21,500 people were employed in the quick service restaurants sector in 2012. Employment grew rapidly over the 10 years to 2012, increasing by 4.3% per annum compared with 1.3% in the national economy. The sector was not as hard hit by the recession as the rest of the New Zealand economy. It is less affected by economic downturn as individuals opt for takeaways instead of high- cost eating options, such as restaurants, during times of economic hardship.

There were more than 4,700 business units in the sector in 2012. The number of business units in the sector grew rapidly between 2001 and 2006 and much slower thereafter. The number of business units grew by 2.4% per annum over the 10 years to 2013, which was somewhat faster than in the national economy (1.8%).

The sector contributed $467 million to the New Zealand economy in 2012 (measured in 2010 prices). This level was up from $240 million 10 years earlier. Output in the industry grew by 6.9% over the ten years to 2012, compared with 2.3% in the national economy. The sector accounted for 0.2% of national GDP in 2012. GDP per FTE in the sector was less than one-third of the national level.

Table 1. Summary indicators for quick service restaurants sector

		Quick Service Restaurants	New Zealand
Jobs	Number in 2012	21,551	2,199,074
	% growth 2002-2012	4.3%	1.3%
FTEs	Number in 2012	14,756	1,871,104
	% growth 2002-2012	4.4%	1.3%
Businesses	Number in 2013	4,714	507,908
	% growth 2003-2013	2.4%	1.8%
GDP ($ million)	Number in 2012	$467	$199,966
	% growth 2002-2012	6.9%	2.3%
GDP per FTE	Number in 2012	$31,637	$106,871
	% growth 2002-2012	2.4%	0.9%

Source: Statistics NZ and Infometrics

Unique characteristics

The quick service restaurants sector has a much higher proportion of very young (15-24 year-olds) workers than the national economy. More than a quarter of all employees are under 20 in this sector compared with 4.8% in the national economy.

There were more female than male workers in the sector in 2013. Females accounted for 55.5% of total employment compared with 47.1% in the national economy.

Asians have a considerably higher representation in the sector than in the national economy. They account for more than 44% of workers in the sector compared with 11.1% in the national economy. Making up 10.4% and 4.3% of quick service

restaurants sector employees, Māori and Pacific peoples are under-represented when compared to employment across all industries (11.2% and 5.0% respectively).

The quick service restaurants sector employed a considerably lower proportion of New Zealand-born workers compared to all industries in 2013. New Zealand-born workers comprised 71.7% of workers in all industries but only 47.2% in the quick service restaurants sector.

Compared to all industries, the sector in 2013 employed considerably more part-time (less than 30 hours) workers. Nearly half (45.0%) of workers in the quick-service industry are employed part-time compared with 21.1% in the national economy.

Two-thirds of employees in the sector had no post-school qualifications in 2013. This was a significantly higher proportion than in the national economy (43.4%).

Training

ServiceIQ had 7,490 quick service restaurants sector trainees at some point in 2013, which accounted for 34.7% of all ServiceIQ trainees.

The majority (78%), of trainees in the sector are studying towards Level 2 qualifications. By contrast, 63.1% of trainees across the whole of ServiceIQ are studying for Level 2 qualifications. Only 6.7% of trainees in the sector are studying at Level 4 and above.

Mäori comprise 16.7% and Pasifika 9.1% of trainees in the sector.

Sector outlook

Employment in the sector is expected to rise rapidly over the next five years. We forecast total employment in the sector to increase from 21,551 in 2012 to 25,293 by 2017.

Driving growth in employment in the industry will be increasing sales of takeaways and fast food. This sales growth will be driven by household discretionary expenditure climbing in line with improving labour market conditions.

Employment growth will be relatively evenly spread, with broad occupation categories in the sector all growing between 2% to 6%pa over the five years to 2017. The broadness of this growth reflects the fact that enterprises in the industry are efficiently run after the recession has shaken out the less efficient enterprises. The surviving enterprises typically do not have spare labour capacity; therefore any increase in business activity necessitates hiring across most business functions.

1. INTRODUCTION

This report presents a profile of the quick service restaurants sector. It describes trends in employment, the basic characteristics of the sector and its employees, and the characteristics of its trainees and learners. It also provides an insight into the future and presents forecasts of employment growth.

Unless otherwise stated this report presents data for calendar years.

Defining the quick service restaurants sector

In this study we have defined the quick service restaurants sector as all persons employed in *all occupations* in Takeaway Food Services (code H451200 in the 2006 Australia New Zealand Standard Industrial Classification).

Takeaway food services consists of units mainly engaged in providing food services ready to be taken away for immediate consumption. Customers order or select items and pay before eating. Items are usually provided in takeaway containers or packaging. Food is either consumed on the premises in limited seating facilities, or taken away by the customer or delivered. This class also includes units mainly engaged in supplying food services in food halls and food courts.

This definition has been chosen as it is the group of industries and occupations that most closely align with the ServiceIQ gazetted coverage of the quick service restaurant sector. The gazetted coverage of the sector includes: “fast food and take-away national and regional chains, franchises and independent outlets”.

2. SECTOR PROFILE

Employment trends to 2012

Approximately 21,500 people were employed in the sector in 2012. Employment in the sector grew rapidly over the 10 years to 2012, increasing by 4.3% per annum compared with 1.3% in the national economy. The sector was not as hard hit by the recession following the Global Financial Crisis as the rest of the New Zealand economy. The sector is less affected by economic downturn as individuals opt for takeaways instead of higher-cost eating options, such as restaurants, during times of economic hardship.

An outlook for the sector is provided in the section *Outlook for the quick service restaurants sector* on page 15.

Table 2. Total employment in the quick service restaurants sector, 2001-2012

Year	Quick Service Restaurants			New Zealand	
	FTEs	Jobs	Change	Jobs	Change
2001	9,019	13,360		1,862,895	
2002	9,581	14,192	6.2%	1,923,798	3.3%
2003	10,469	15,508	9.3%	1,979,437	2.9%
2004	11,211	16,607	7.1%	2,039,390	3.0%
2005	12,107	17,933	8.0%	2,108,155	3.4%
2006	12,739	18,869	5.2%	2,142,486	1.6%
2007	13,096	19,353	2.6%	2,184,802	2.0%
2008	12,882	18,991	-1.9%	2,219,403	1.6%
2009	13,055	19,202	1.1%	2,167,989	-2.3%
2010	13,852	20,326	5.9%	2,160,647	-0.3%
2011	14,265	20,883	2.7%	2,180,241	0.9%
2012	14,756	21,551	3.2%	2,199,074	0.9%
2002-2012			**4.3%**		**1.3%**

Source: Statistics NZ and Infometrics

Figure 1. Total employment in the quick service restaurants sector, 2001 to 2012

Source: Statistics NZ and Infometrics

Occupations

This section examines the growth in occupations in the quick service restaurants sector. By drawing on data from the population census it is possible to split out employment in the sector to approximately 1,000 detailed occupational categories. In this section we report on an aggregation of those categories into eight broad categories as well as the numerically largest detailed occupations.

Table 3 shows employment by broad occupations. Managers and sales workers are the largest occupational categories in the sector, accounting for 21.5% and 27.1% of employment in 2012. Employment grew strongly across all occupational categories over the ten years to 2012.

Table 3. Employment by broad occupation[1]

Occupation	Employment		Change 2002 - 2012 pa		% of total
	2002	2012	Jobs	%	2012
Managers	3,028	4,640	161	4.4%	21.5%
Professionals	119	382	26	12.4%	1.8%
Technicians & Trades Workers	2,201	3,419	122	4.5%	15.9%
Community & Personal Service Workers	1,038	1,622	58	4.6%	7.5%
Clerical & Administrative Workers	293	677	38	8.7%	3.1%
Sales Workers	4,376	5,835	146	2.9%	27.1%
Machinery Operators & Drivers	535	781	25	3.9%	3.6%
Labourers	2,602	4,196	159	4.9%	19.5%
Total	14,192	21,551	736	4.3%	100.0%

Source: Statistics NZ and Infometrics

Figure 2. Employment by broad occupation, 2002 and 2012

Source: Statistics NZ and Infometrics

[1] This table shows change in employment between 2002 and 2012. Change is measured in per annum terms. The change in the number of jobs per annum between 2002 and 2012 is equal to the difference between the value in 2012 and 2002 divided by 10.

Table 4 shows employment in the 20 numerically largest occupations in the sector. The largest occupations are sales assistant (general) and retail manager (general) which account for 15.2% and 9%of employment in the sector respectively. Collectively the top 20 occupations account for 61.3% of total employment in the sector.

Table 4. Employment of top 20 occupations in the quick service restaurants sector

Occupation	Employment		% of total employment, 2012	Change 2002 - 2012 pa	
	2002	2012		Number	%
Sales Assistant (General)	3,282	3,772	15.2%	49	1.4%
Retail Manager (General)	1,936	2,142	9.0%	21	1.0%
Cook	1,433	1,444	6.7%	1	0.1%
Kitchenhand	1,028	2,161	4.8%	113	7.7%
Sales Representatives nec	777	1,275	3.6%	50	5.1%
Food Trades Assistants nec	691	665	3.2%	-3	-0.4%
Chef	648	1,733	3.0%	109	10.3%
Fast Food Cook	582	722	2.7%	14	2.2%
Café or Restaurant Manager	530	1,156	2.5%	63	8.1%
Delivery Driver	478	684	2.2%	21	3.6%
Waiter	455	714	2.1%	26	4.6%
Café Worker	400	465	1.9%	6	1.5%
Corporate General Manager	229	497	1.1%	27	8.1%
Chief Executive or Managing Director	205	400	1.0%	19	6.9%
Office Cashier	116	495	0.5%	38	15.7%
Street Vendor	113	104	0.5%	-1	-0.9%
General Clerk	80	117	0.4%	4	3.8%
Commercial Cleaner	79	96	0.4%	2	2.0%
Baker	77	117	0.4%	4	4.2%
Food and Drink Factory Workers nec	70	251	0.3%	18	13.6%
Top 20 occupations	**13,210**	**19,009**	**61.3%**	**580**	**3.7%**

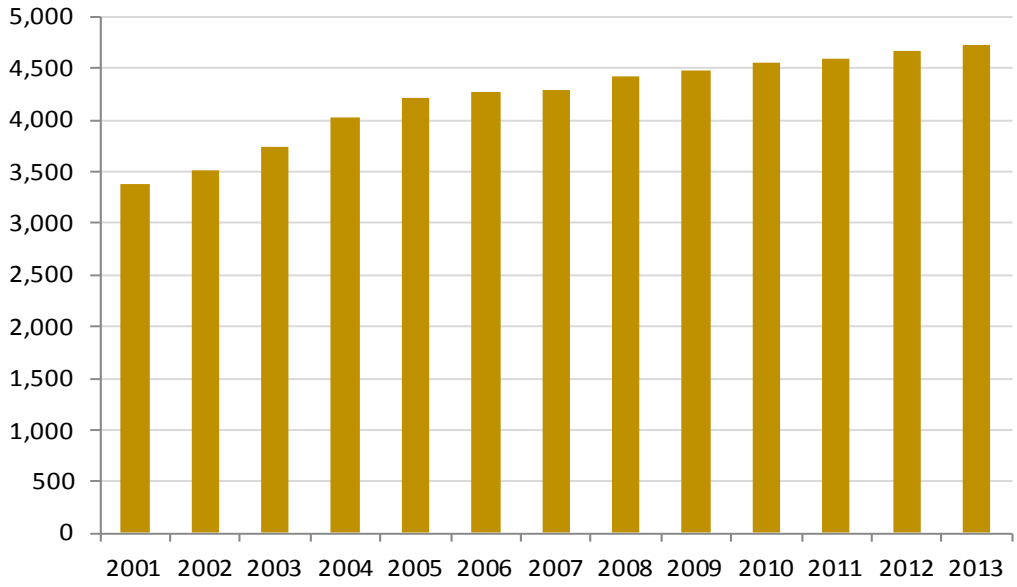
Source: Statistics NZ and Infometrics

Business units

There were more than 4,700 business units in the sector in 2012. Figure 3 shows that the number of business units in the sector grew rapidly between 2001 and 2006 and much slower thereafter. Growth even continued through the recession, which indicates that the sector is resilient to recession as individuals switch from higher-cost eating options to quick-service restaurants during times of economic hardship. The number of business units in the sector grew by 2.4% per annum over the 10 years to 2013, which was somewhat faster than in the national economy (1.8%).

As the economy gains momentum over the next few years we expect new enterprises to emerge in the sector as individuals are prepared to make new investments in a rapidly growing industry.

Figure 3. Number of business units in the quick service restaurants sector, 2000-2013



Source: Statistics NZ

Table 5. Number of business units (as at February)

	2003	2013	Change 02-12 pa Number	Change 02-12 pa %
Quick Service Restaurants	3,730	4,714	98	2.4%
New Zealand	426,829	507,908	8,108	1.8%

Source: Statistics NZ

Size of businesses

On average, business units in the sector are larger than in the national economy. Approximately 12% of business units in sector had 10 or more employees in 2013, compared with 8% in the national economy. Most enterprises are in the medium-size categories (10 to 49) – these are likely to be branches of the takeaway chains. Small enterprises are nevertheless important, with those businesses employing fewer than 10 people accounting for more than 36% of employment in the sector.

Table 6. Number of business units by number of employees

	Number		% of total		Employment
	Quick Service Restaurants	New Zealand	Quick Service Restaurants	New Zealand	Quick Service Restaurants
0-5	3,672	442,363	77.9%	87.1%	4,407
6 to 9	481	26,403	10.2%	5.2%	3,365
10 to 19	395	21,254	8.4%	4.2%	4,736
20 to 49	147	11,832	3.1%	2.3%	3,684
50 to 99	17	3,657	0.4%	0.7%	925
100 and Over	2	2,399	0.0%	0.5%	4,435
Total	4,714	507,908	100.0%	100.0%	21,551

Source: Statistics NZ

Geography

Auckland is the region with the highest number of employees, accounting for 36.3% of employment in the sector in 2012. This was followed by Wellington (12.2%) and Canterbury (11.0%). Over the 10 years to 2012, fastest growth was measured in Auckland (5.9%), Bay of Plenty (4.7%), and Otago (4.4%).

Table 7. Number of employees by region

	Number		% of total	FTE	Change 2002-2012 pa	
Region	2002	2012	2012	2012	Number	%
Auckland	4,409	7,816	36.3%	5,352	341	5.9%
Wellington	1,785	2,631	12.2%	1,802	85	4.0%
Canterbury	1,782	2,372	11.0%	1,624	59	2.9%
Waikato	1,343	1,924	8.9%	1,317	58	3.7%
Bay of Plenty	958	1,510	7.0%	1,034	55	4.7%
Manawatu-Wanganui	831	1,197	5.6%	819	37	3.7%
Otago	632	973	4.5%	666	34	4.4%
Gis-Hawke's Bay	853	949	4.4%	649	10	1.1%
Tas-Nel-Marl	418	635	2.9%	435	22	4.3%
Northland	413	582	2.7%	398	17	3.5%
Taranaki	348	451	2.1%	308	10	2.6%
Southland	318	394	1.8%	270	8	2.2%
West Coast	104	119	0.6%	81	1	1.3%
New Zealand	14,192	21,551	100.0%	14,756	736	4.3%

Source: Statistics NZ and Infometrics

Economic contribution

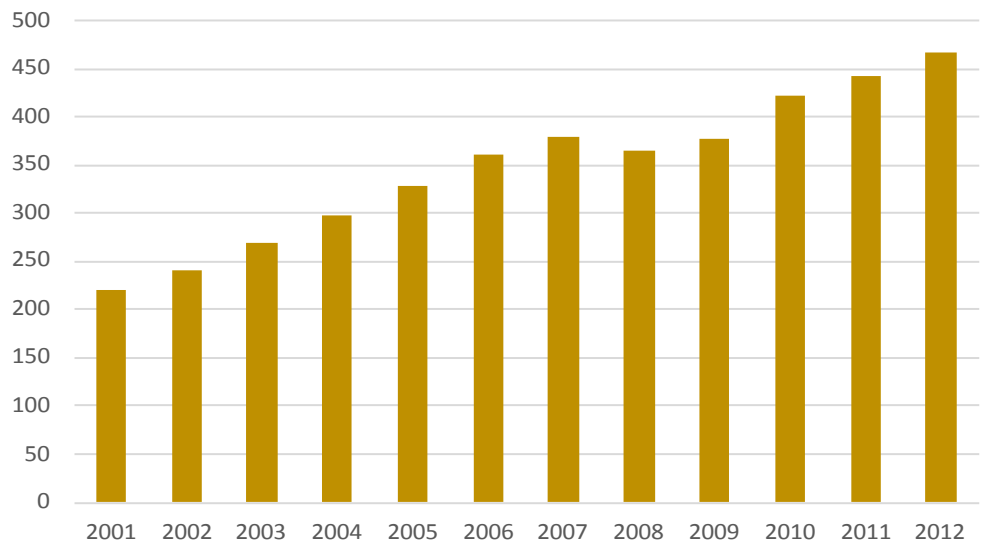
The sector contributed $467 million to the New Zealand economy in 2012 (measured in 2010 prices[2]). This level was up from $240 ten years prior. Output in the industry grew by 6.9% over the ten years to 2012, compared with 2.3% in the national economy. The sector accounted for 0.2% of national GDP in 2012.

Table 8. Contribution to GDP by the quick service restaurants sector (2001-2013)

Year	Quick Service Restaurants		New Zealand	
	$ million	Change	$ million	Change
2001	220		152,045	
2002	240	9.0%	159,473	4.9%
2003	269	12.1%	166,488	4.4%
2004	297	10.3%	173,781	4.4%
2005	328	10.5%	178,428	2.7%
2006	360	9.8%	182,439	2.2%
2007	379	5.0%	188,639	3.4%
2008	365	-3.5%	187,362	-0.7%
2009	377	3.3%	188,588	0.7%
2010	422	11.7%	192,015	1.8%
2011	441	4.7%	194,322	1.2%
2012	467	5.7%	199,966	2.9%
2002-2012		**6.9%**		**2.3%**

Source: Statistics NZ and Infometrics

Figure 4. Quick service restaurants sector GDP ($m)



Source: Statistics NZ and Infometrics

[2] In this profile, we present all GDP estimates in constant 2010 prices. GDP presented in constant prices is sometimes referred to as real GDP. By using constant prices we remove the distractionary effect of inflation. It enables us to meaningfully compare GDP from one year to the next. Our GDP estimates differ from those published by Statistics New Zealand which are at 1995/6 prices.

Other indicators: selected fast-food operators sales figures

Fast food companies have continued to thrive in the years following the onset of the New Zealand recession and Global Financial Crisis in 2008. This result is not surprising because when households cut back their hospitality expenditure, it is common that they first cut back on higher-cost bar and restaurant options and substitute some of this demand for lower-cost fast food alternatives.

Restaurant Brands, which controls the KFC, Pizza Hut, Carl Jr and Starbucks fast food chains, has steadily increased its sales over recent years. In the March 2008 financial year, Restaurant Brands had NZ sales of $303.5 million. By March 2013 sales had increased 2.8% to $311.9 million.

McDonald's has also performed well in New Zealand, paying its US parent company a $154 million dividend in 2011 – its biggest dividend in at least a decade.

Smaller fast food operators have also performed well. For example, since listing on the New Zealand Stock Exchange during the 2008 financial year, Burger Fuel had increased its New Zealand sales from $21 million (and 23 NZ stores) to $31 million of sales (and 30 NZ stores) by the 2013 financial year.

3. INDUSTRY OUTLOOK

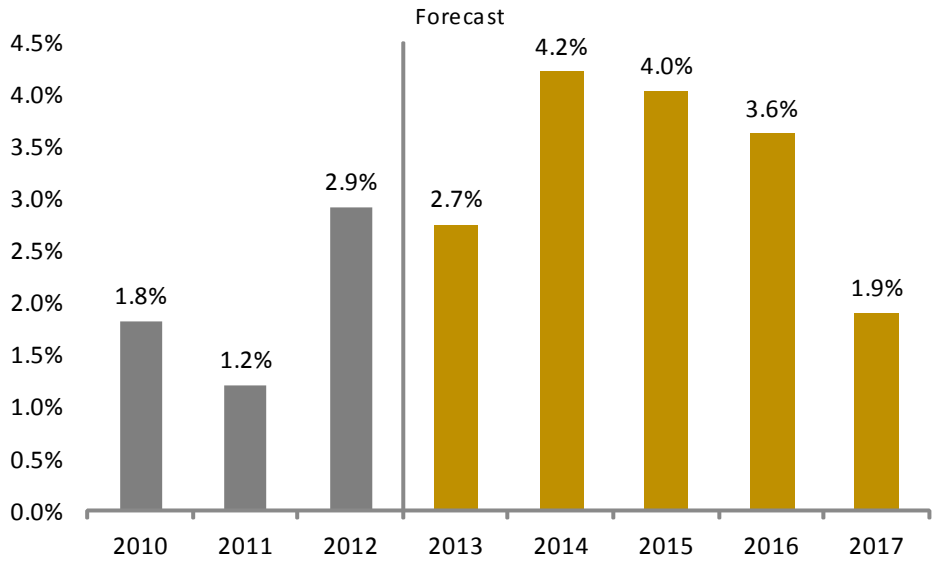
Outlook for the New Zealand economy

Economic growth in New Zealand is forecast to average 4.2% per annum (pa) over the two years to March 2016, as activity is supported by strong export incomes, rising construction activity, and healthy domestic confidence. Chinese and Australian economic growth rates are moderating, but demand for our primary exports will remain strong as household spending continues to grow in China. New Zealand's strong economic performance over the next 2-3 years will be accompanied by:

- higher net migration – climbing above 30,000pa by mid-2014 and remaining over 20,000pa as we head into 2015
- good employment growth, driving the unemployment rate down to 5% by the end of 2015
- accelerating wage growth, lifting to 3.5%pa by March 2016
- rising interest rates, with the official cash rate reaching 5% by the beginning of 2016
- The return of inflation over 2%pa, due to the strengthening domestic economy, costs associated with the Christchurch rebuild, and a gradual lift in import prices.

Economic growth is forecast to peak at 4.4%pa in March 2015, with growth moderating over the following two years as the stimulus from high export incomes fades, rebuilding activity in Canterbury reaches its peak, and growth in the housing market and domestic economy slows in response to the rise in interest rates that has taken place.

Figure 5. New Zealand GDP growth forecast to 2017 (calendar years)



Source: Statistics NZ and Infometrics

Outlook for the quick service restaurants sector

Sector outlook

Employment in the sector is expected to rise rapidly over the next five years. We forecast total employment in the sector to increase from 21,551 in 2012 to 25,293 by 2017.

Driving growth will be increasing sales of takeaways and fast food. This sales growth will be driven by household discretionary expenditure climbing in line with improving labour market conditions.

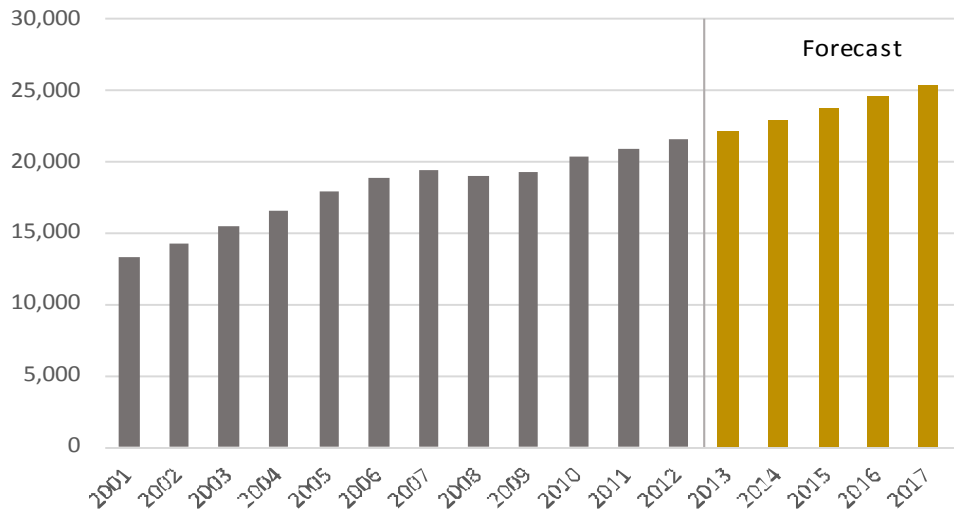
Employment growth will be relatively evenly spread, with broad occupation categories in the sector all growing between 2% to 6%pa over the five years to 2017. The broadness of this growth reflects the fact that enterprises in the industry are efficiently run after the recession has shaken out the less-efficient enterprises. The surviving enterprises typically do not have spare labour capacity; therefore any increase in business activity necessitates hiring across most business functions.

Table 9. Total employment in the quick service restaurants sector, 2012-2017

Year	Quick Service Restaurants	
	Level	Change pa
2012	21,551	3.2%
2013	22,163	2.8%
2014	22,874	3.2%
2015	23,761	3.9%
2016	24,471	3.0%
2017	25,293	3.4%
2012-2017		3.3%

Source: Statistics NZ and Infometrics

Figure 6. Total employment in the quick service restaurants sector, 2001-2017



Source: Statistics NZ and Infometrics

Occupation outlook

The tables below show forecast of employment by broad occupation and the 20 numerically largest detailed occupations in the sector. In addition to new positions being created, positions will need filling due to replacement of existing staff as others enter and leave occupations. The tables below show new jobs opening due to growth in employment, net positions opening due to replacement and total positions opening.

Net replacement demand is a method for estimating job openings by occupation arising from individuals leaving an occupation net of jobs taken by individuals re-entering the occupation. By netting out individuals re-entering an occupation, net replacement rate measures are a subset of more commonly cited labour turnover rates. Net replacement demand is the relevant measure for providing advice on education and training needs. Details about the method used to measure future net replacement demand are provided in the appendix.

Table 10. Forecast of employment by broad occupation, 2012-2017

Occupation	Employment		Change 2012 - 2017 pa		Replace-ment pa	Total positions
	2012	2017	New jobs	%		
Managers	4,640	5,422	157	3.2%	200	356
Professionals	382	508	25	5.8%	13	38
Technicians & Trades Workers	3,419	4,273	171	4.6%	88	259
Community & Personal Service Workers	1,622	1,913	58	3.4%	116	174
Clerical & Administrative Workers	677	838	32	4.4%	23	56
Sales Workers	5,835	6,707	174	2.8%	402	576
Machinery Operators & Drivers	781	864	17	2.0%	118	134
Labourers	4,196	4,767	114	2.6%	354	468
Total	21,551	25,293	748	3.3%	1,313	2,061

Source: Statistics NZ and Infometrics

Table 11. Forecast of employment for top 20 occupations

Occupation	Employment		Change 2012 - 2017 pa		Net replace-ment pa	Total net positions opening pa
	2012	2017	Jobs	%		
Sales Assistant (General)	3,772	4,167	79	2.0%	336	415
Retail Manager (General)	2,142	2,194	10	0.5%	72	83
Cook	1,444	1,669	45	2.9%	36	81
Kitchenhand	2,161	2,545	77	3.3%	247	323
Sales Representatives nec	1,275	1,511	47	3.5%	1	48
Food Trades Assistants nec	665	755	18	2.6%	60	78
Chef	1,733	2,298	113	5.8%	47	160
Fast Food Cook	722	726	1	0.1%	32	33
Café or Restaurant Manager	1,156	1,529	75	5.8%	93	168
Delivery Driver	684	753	14	1.9%	115	129
Waiter	714	817	21	2.7%	58	79
Café Worker	465	493	6	1.2%	30	36
Corporate General Manager	497	641	29	5.2%	12	41
Chief Executive or Managing Director	400	480	16	3.7%	10	26
Office Cashier	495	680	37	6.6%	21	58
Street Vendor	104	109	1	0.9%	5	6
General Clerk	117	87	-6	-5.8%	2	-4
Commercial Cleaner	96	93	0	-0.5%	2	2
Baker	117	129	2	2.0%	2	4
Food and Drink Factory Workers nec	251	271	4	1.6%	0	5

Source: Statistics NZ and Infometrics

The occupations with the largest number of positions opening over the five years to 2017 are sales assistant (general) (415 per year), kitchenhand (323 per year), and cafés and restaurants manager (168 per year).

4. OPPORTUNITIES AND CHALLENGES

Issues facing the whole sector

Overview of outlook and background

Strengthening economic activity and a healthy outlook for discretionary spending growth, coupled with a growing population, bode well for the sector as a whole over the coming decade. Nevertheless, the sector will grapple with compositional changes in terms of the types of products it sells, as a result of concerns regarding healthy eating and increased demand for higher quality products as income growth picks up. Key risks for the sector include the living wage debate, as well as the potential for local government mergers to increase compliance costs during transitional years.

Strengthening economy bodes well for quick service restaurants

The New Zealand economy is forecast to go through a period of above-trend growth over the next three years. As a result of this rapid economic strengthening, labour market earnings and in turn discretionary income levels (income after taxes and spending on necessities are subtracted) will rise. In this environment, households will become increasingly willing to spend on discretionary items such as takeaways and fast food.

Demand for quick service restaurants will also be pushed up by strong population growth as a result of elevated net migration. This population growth, coupled with renewed interest in home building, is leading to the development of significant greenfields housing developments, particularly in Auckland and Canterbury. These new developments will open up opportunities for convenience food options in surrounding suburbs.

Higher quality products to be the big winner

Although spending in the sector will rise rapidly, there will also be compositional changes within the sector. For example, as households become more comfortable with their financial positions they will not only demand more fast food, but they will also demand better quality products. In response to this changing demand, quick-service restaurants will find that sales of higher quality items grow more rapidly than lower end food items. Increasing quality will mean that quick-service restaurants will demand higher-skilled workers.

Issues stemming from regulations

Adapting to healthy eating trends

The sector will have to continue evolving to meet the trend towards healthy eating and a growing awareness of food intolerance. Although the consumer demand-driven aspect of this trend is relatively slow moving, the risk of sudden regulatory changes poses a challenge to the sector. It is unlikely that government would implement any of the so-called “fat taxes” that have been mooted, but there is still a risk of additional regulatory requirements for enterprises to provide more detailed nutritional descriptions and ensure certain skill levels of staff. The Food Bill will shortly have its second reading in parliament. The Bill focuses on health and

safety and will have an impact on what businesses do and what training their staff require if it is enacted.

Transitioning into super-city regulatory frameworks

Another regulatory risk for the sector stems from proposed local government mergers and the creation of new super cities. The creation of these new local government jurisdictions would be unlikely to increase the cost of conforming to registration and food safety standards over the long-term, but the transition phase could create additional costs for operators in the short-term as they adapt to new processes.

Living wage debate to challenge the sector

It is natural that in a growing economy there will be significant pressure to raise minimum wages. Although rising minimum wages will push up input costs, this cost pressure restaurant operators will be offset by rising profitability levels as improving economic conditions give operators greater scope for price increases.

A bigger challenge for the sector will be responding to the living wage debate which is seeking to raise wages to about $18.80 per hour. A living wage compares to the minimum wage of $14.25 per hour applicable from 1 April 2014. Although a living wage may appear good for workers at face value, if it became mandatory the policy could cause some restaurants to reduce staffing levels to reduce the effect on input costs.

It is unlikely that living wages will become mandatory, but the creation of an accreditation scheme by non-government organisations for living-wage employers is a potential scenario. Obviously inclusion in such a scheme would be voluntary, but adoption of the practice could lead to product differentiation by some quick service restaurant operators looking to target consumers seeking ethically aware choices.

5. DEMOGRAPHICS

This chapter describes the demographic characteristics of employees in the quick service restaurants sector. It draws heavily on the 2006 and 2013 population census.

Age

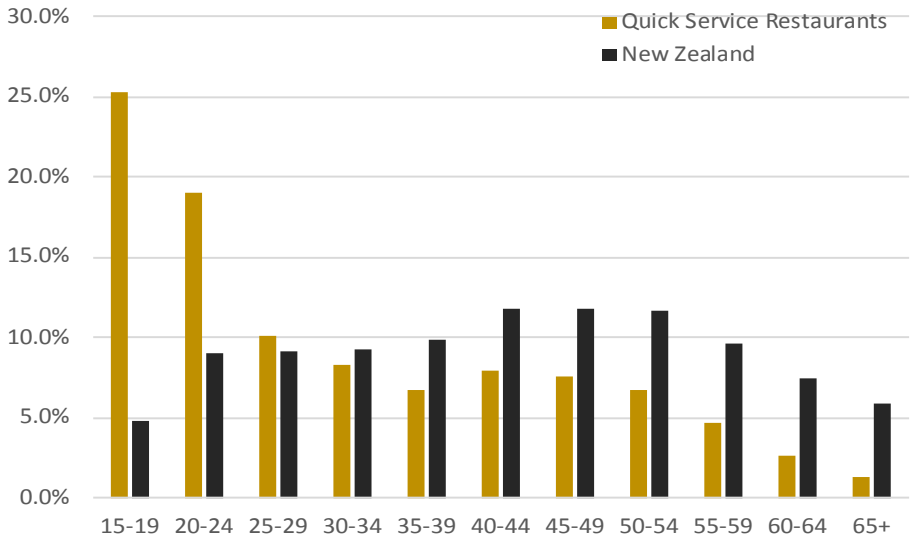
The sector has a much higher proportion of very young (15-24 year-olds) workers than the national economy. More than a quarter of all employees are under 20 in quick service restaurants compared with 4.8% in the national economy. The number of relatively low-skilled, part-time jobs in the sector is attractive to young workers who are able to fit their jobs around study.

Table 12. Employment by 5-year age group in the quick service restaurants sector

Age Group	Employment		% of Total		NZ % of Total
	2006	2013	2006	2013	2013
15-19	6,097	5,477	33.9%	25.2%	4.8%
20-24	2,793	4,126	15.5%	19.0%	9.1%
25-29	1,354	2,200	7.5%	10.1%	9.1%
30-34	1,259	1,786	7.0%	8.2%	9.2%
35-39	1,341	1,451	7.4%	6.7%	9.9%
40-44	1,508	1,717	8.4%	7.9%	11.7%
45-49	1,367	1,639	7.6%	7.5%	11.8%
50-54	1,083	1,461	6.0%	6.7%	11.6%
55-59	752	1,019	4.2%	4.7%	9.5%
60-64	304	561	1.7%	2.6%	7.4%
65+	144	274	0.8%	1.3%	5.9%
Total	18,002	21,710	100.0%	100.0%	100.0%

Source: Statistics NZ and Infometrics

Figure 7. Proportion of total employment by 5-year age group

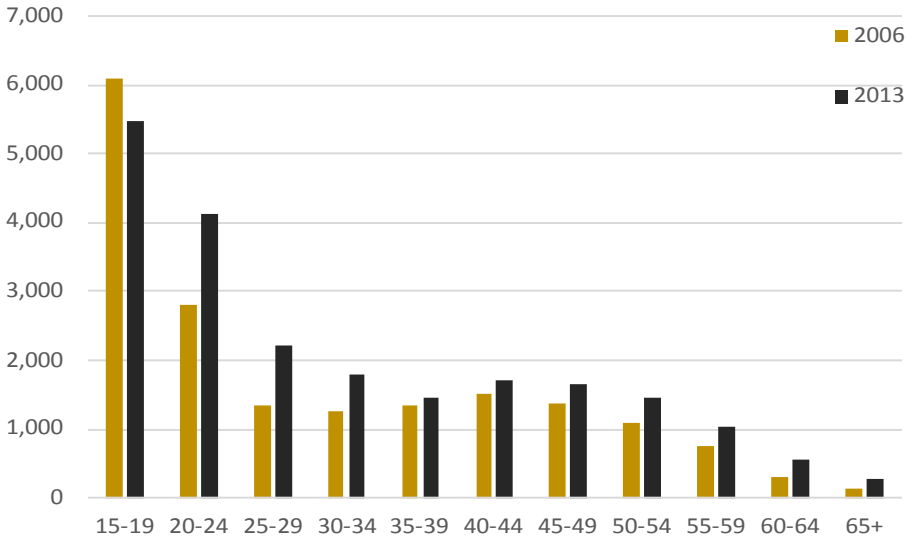


Source: Statistics NZ and Infometrics

The number of young employees aged between 15 and 24 declined slightly between 2006 and 2013, while the number of employees in all other age categories

increased. This suggests that individuals across all age groups held onto their jobs for longer because of the tough employment environment and the sector did not need to recruit the usual number of young workers.

Figure 8. Employment by 5-year age group in the quick service restaurants sector



Source: Statistics NZ and Infometrics

Gender

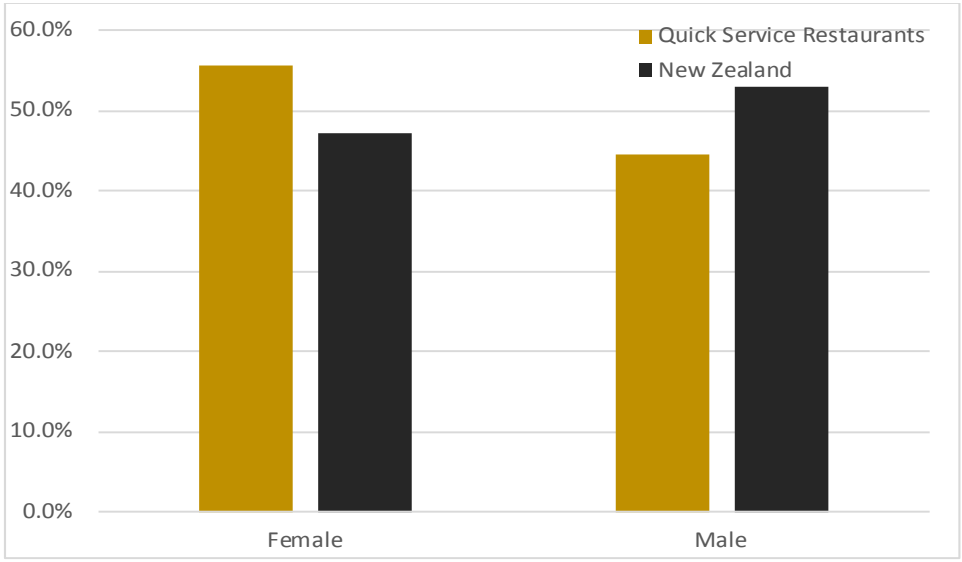
There were more female than male workers in the sector in 2013. Females accounted for 55.5% of total employment in quick services compared with 47.1% in the national economy. The share of female workers decreased from 57.7% to 55.5% between March 2006 and March 2013. This may be related to the different experience between females and males during the recession following the Global Financial Crisis. Males were more adversely affected in the wider economy due to job losses in industries in which males are concentrated, such as construction and manufacturing. The relative increase in availability of males may have increased the relative number of males to females applying for jobs in the sector.

Table 13. Employment by gender in the quick service restaurants sector

Gender	Employment		% of Total		NZ% of Total
	2006	2013	2006	2013	2013
Female	10,383	12,051	57.7%	55.5%	47.1%
Male	7,619	9,659	42.3%	44.5%	52.9%
Total	18,002	21,710	100.0%	100.0%	100.0%

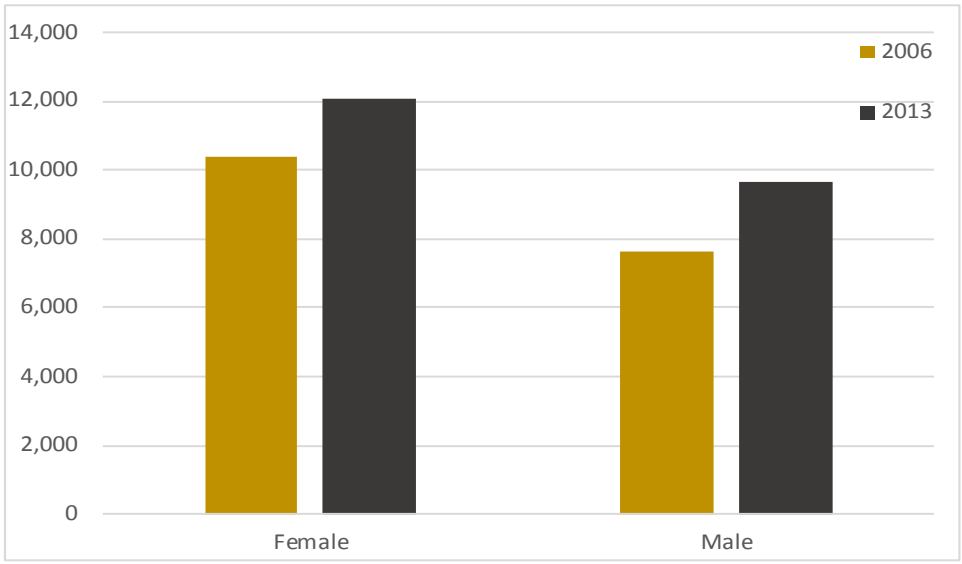
Source: Statistics NZ and Infometrics

Figure 9. Proportion of total employment by gender, 2013



Source: Statistics NZ and Infometrics

Figure 10. Employment by gender, 2006 and 2013



Source: Statistics NZ and Infometrics

Highest qualification

Two-thirds of employees in the sector had no post-school qualifications in 2013. This was a significantly higher proportion than in the national economy (43.4%).

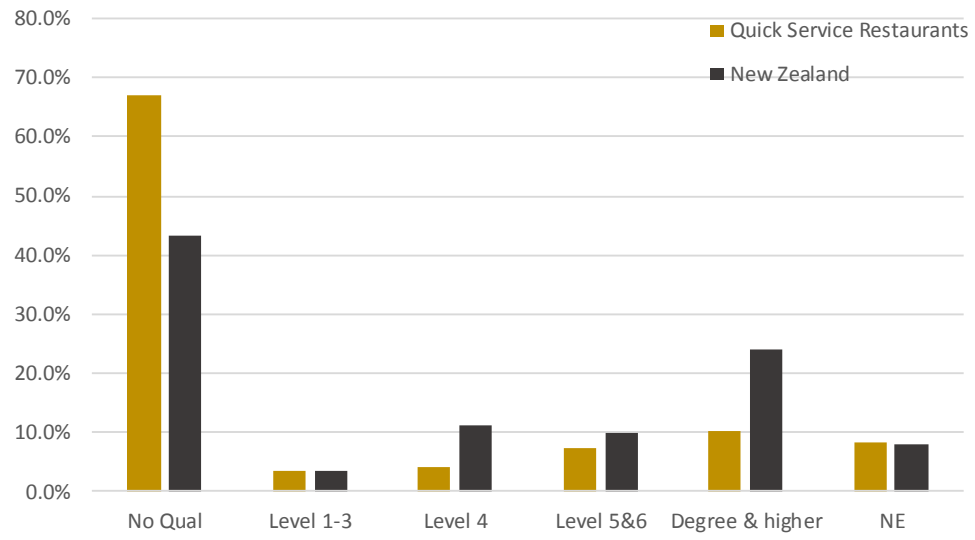
Average training levels increased between 2006 and 2013 with the number of workers without a qualification falling from 76.1% to 67%. At the other end of the spectrum the number of workers with a degree or higher increased from 7% to 10% over the seven-year period. This may be a consequence of young graduates not being able to find suitable employment in their chosen fields and accepting lower-skilled work in the sector.

Table 14. Employment by highest qualification sector

Highest qualification	Employment		% of Total		NZ% of Total
	2006	2013	2006	2013	2013
No Post-school Qualification	13,699	14,535	76.1%	67.0%	43.4%
Level 1, 2 or 3 Certificate	821	780	4.6%	3.6%	3.5%
Level 4 Certificate	703	893	3.9%	4.1%	11.2%
Level 5 and 6 diploma	772	1,551	4.3%	7.1%	10.0%
Degrees, level 7 quals and higher	1,262	2,181	7.0%	10.0%	23.9%
Not Elsewhere Included	746	1,770	4.1%	8.2%	7.9%
Total	18,002	21,710	100.0%	100.0%	100.0%

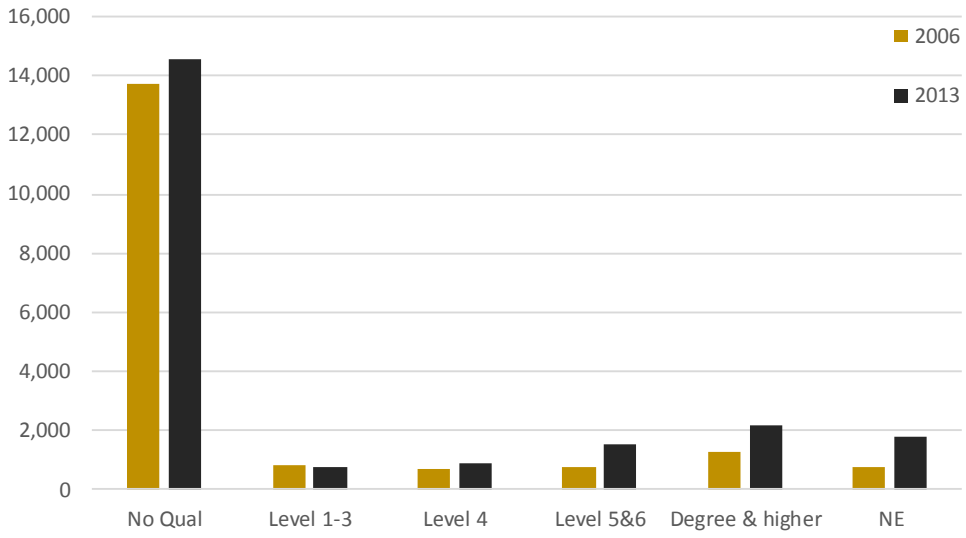
Source: Statistics NZ and Infometrics

Figure 11. Employment by highest qualification, 2013



Source: Statistics NZ and Infometrics

Figure 12. Employment by highest qualification in the sector



Source: Statistics NZ and Infometrics

Ethnicity

Less than half (46.6%) of employees in the sector in 2013 were of European ethnicity. This was considerably lower than in the national economy (77.0%). Asians accounted for nearly the same proportion as Europeans. More than 44% of quick service employees were Asian compared with 11.1% in the national economy. The Asian share of employment increased from 36% in 2006 to 44.1% in 2013. Both Māori and Pasifika were slightly under-represented in the sector relative to the national economy.

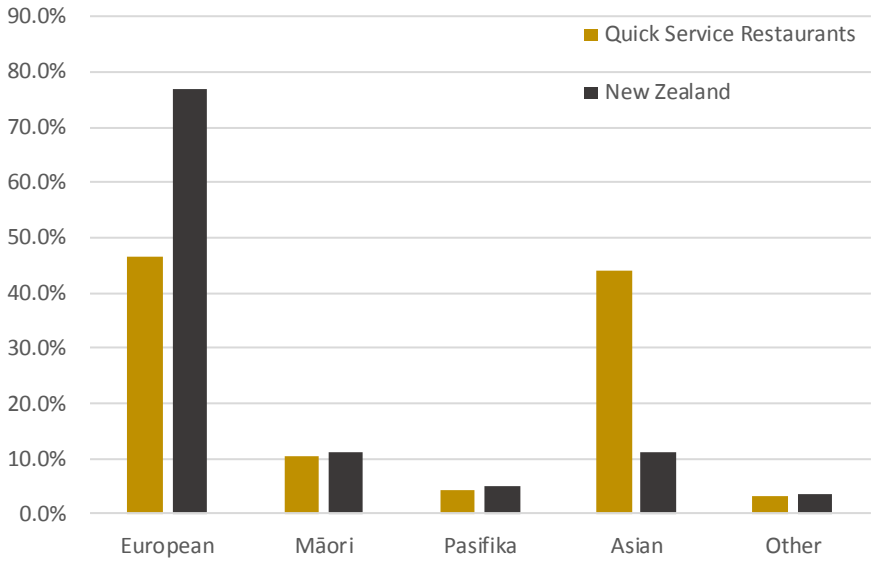
The decrease in employment of workers in the 'Other' category would have been influenced by the substantial decrease in the number of individuals who identified themselves as 'New Zealanders' in the 2013 census compared with the 2006 census.

Table 15. Employment by ethnicity, 2006 and 2013

Ethnic	Employment		% of Total		NZ% of Total
	2006	2013	2006	2013	2013
European	8,931	10,119	49.6%	46.6%	77.0%
Māori	2,031	2,252	11.3%	10.4%	11.2%
Pasifika	739	941	4.1%	4.3%	5.0%
Asian	6,478	9,575	36.0%	44.1%	11.1%
Other	1,658	695	9.2%	3.2%	3.4%
Total	18,002	21,710	110.2%	108.6%	107.6%

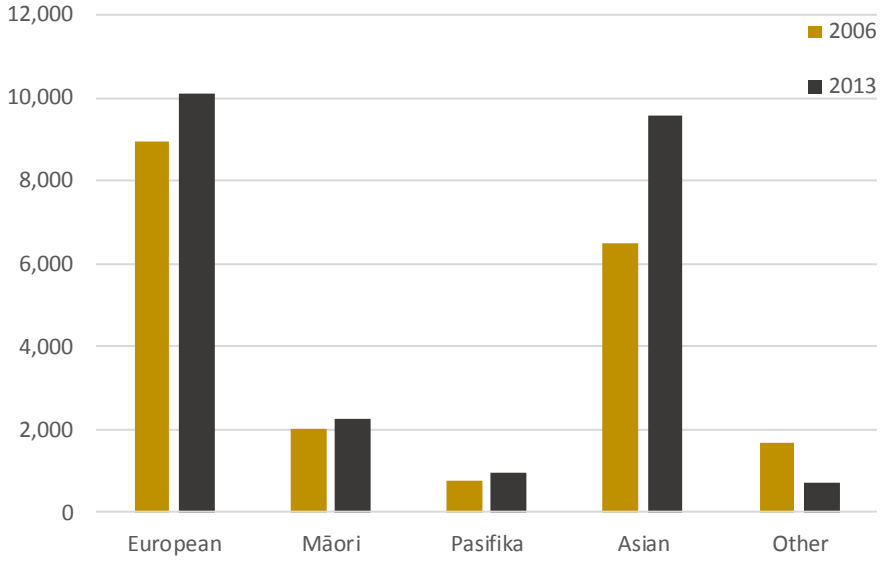
Source: Statistics NZ and Infometrics

Figure 13. Employment by ethnicity, quick service restaurants sector and New Zealand, 2013



Source: Statistics NZ and Infometrics

Figure 14. Employment by ethnicity, 2006 and 2013



Source: Statistics NZ and Infometrics

Country of birth

In 2013, New Zealand-born workers represented 47.2% of the workforce in the sector which was considerably down from 55.4% in 2006. The share of workers born in Asia increased from 31.8% to 39.2% over the same period while the share of workers born in Europe increased slightly to 4.3%.

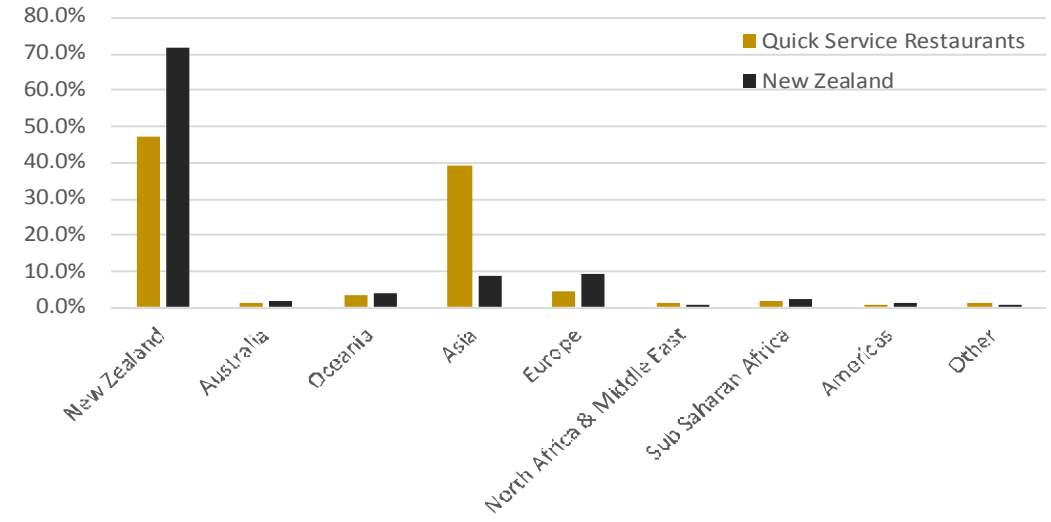
The sector employed a considerably lower proportion of New Zealand-born workers compared to all industries in 2013. New Zealand-born workers comprised 71.7% of workers in all industries but only 47.2% in the sector.

Table 16. Employment by country of birth, 2006 and 2013

Country of Birth	Employment		% of Total		NZ% of Total
	2006	2013	2006	2013	2013
New Zealand	9,973	10,244	55.4%	47.2%	71.7%
Australia	314	270	1.7%	1.2%	1.6%
Oceania	484	708	2.7%	3.3%	3.8%
Asia	5,729	8,502	31.8%	39.2%	8.6%
Europe	720	938	4.0%	4.3%	9.4%
North Africa & Middle East	255	264	1.4%	1.2%	0.4%
Sub Saharan Africa	252	356	1.4%	1.6%	2.3%
Americas	137	195	0.8%	0.9%	1.3%
Other	137	233	0.8%	1.1%	0.9%
Total	18,002	21,710	100.0%	100.0%	100.0%

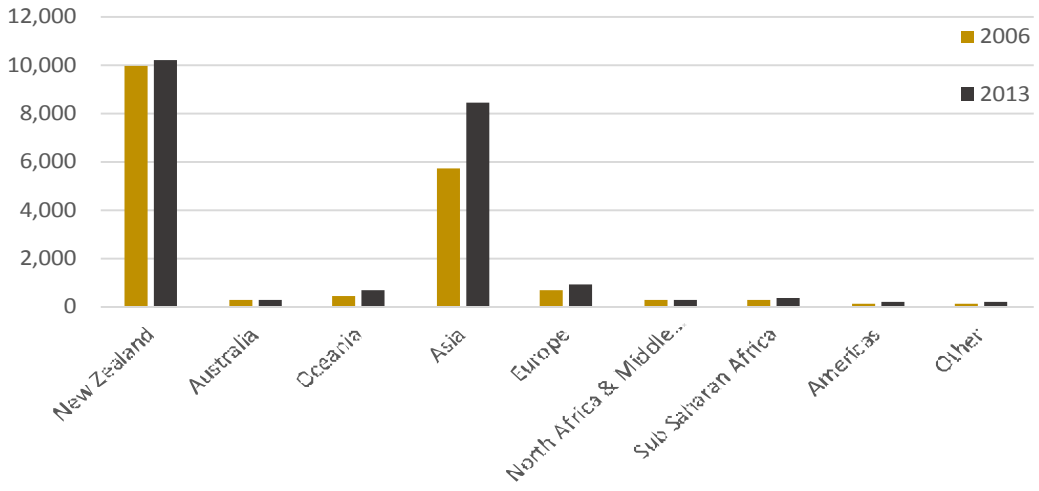
Source: Statistics NZ and Infometrics

Figure 15. Employment by country of birth, quick service restaurants sector and New Zealand, 2013



Source: Statistics NZ and Infometrics

Figure 16. Employment by country of birth in the quick service restaurants sector, 2006 and 2013



Source: Statistics NZ and Infometrics

Hours worked

Those working 40-49 hours per week accounted for the highest share (21%) of employees in the sector in 2013. This share has increased from 18.3% in 2006. Workers doing less than 30 hours represented 45% of the sector, which dropped from 46.3% in 2006. The share of very high hours worked (50 and more) decreased from 17.8% in 2006 to 14.9% in 2013.

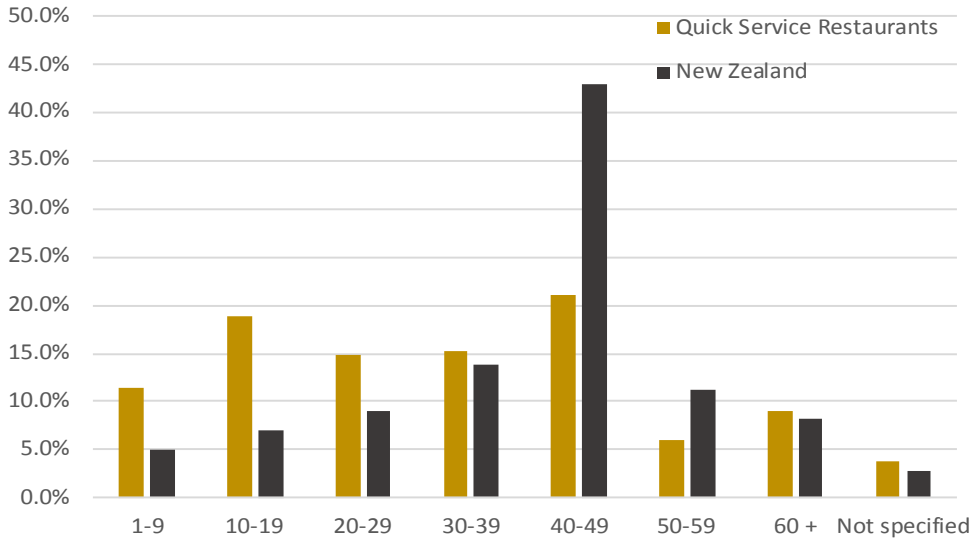
Table 17. Employment by hours worked, 2006 and 2013

Hours Worked	Employment		% of Total		NZ% of Total
	2006	2013	2006	2013	2013
1-9	1,870	2,481	10.4%	11.4%	5.0%
10-19	3,917	4,066	21.8%	18.7%	7.0%
20-29	2,553	3,214	14.2%	14.8%	9.1%
30-39	1,991	3,313	11.1%	15.3%	13.8%
40-49	3,292	4,559	18.3%	21.0%	43.0%
50-59	1,269	1,280	7.0%	5.9%	11.1%
60 +	1,929	1,961	10.7%	9.0%	8.2%
Not specified	1,180	835	6.6%	3.8%	2.8%
Total	18,002	21,710	100.0%	100.0%	100.0%

Source: Statistics NZ and Infometrics

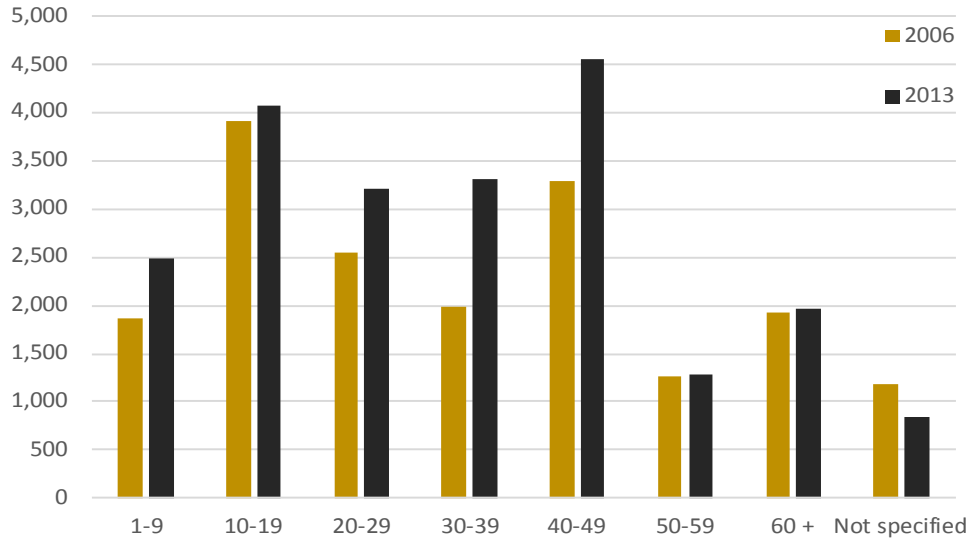
Compared to all industries, the sector in 2013 employed considerably more part-time (less than 30 hours) workers. Nearly half (45%) of workers in the industry were employed part-time compared with 21.1% in the national economy. The share of very high hours worked (more than 50) is 14.9%, which was 4.4% lower than in all industries.

Figure 17. Employment by number of hours worked, quick service restaurants sector and New Zealand, 2013



Source: Statistics NZ and Infometrics

Figure 18. Employment by number of hours worked per week, 2006 and 2013



Source: Statistics NZ and Infometrics

6. TRAINING

This chapter describes the characteristics of individuals being trained by ServiceIQ in 2013. The data includes all individuals who were registered at some point during 2013. The last section in the chapter describes enrolments and completions in provider-based qualifications of relevance to the sector.

Quick service restaurants sector trainees accounted for 31.3% of total ServiceIQ trainees.

Age

Table 18. Number of trainees by 5-year age group

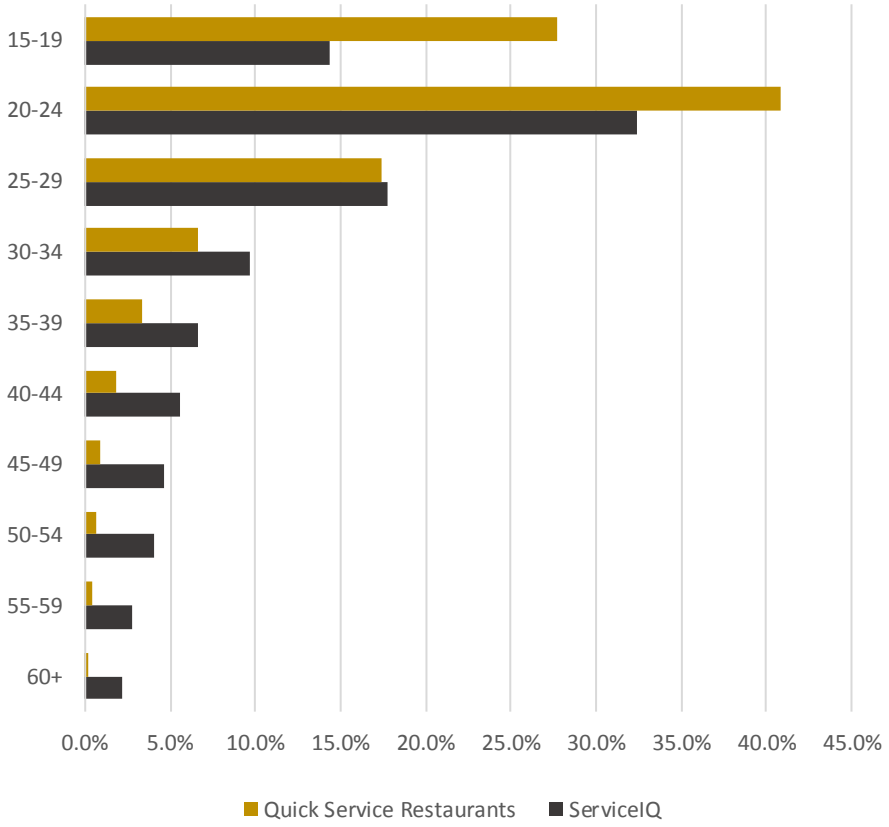
Age group	Number of trainees		% of total		Employment
	Quick Service Restaurants	ServiceIQ	Quick Service Restaurants	ServiceIQ	Quick Service Restaurants
15-19	2,078	3,091	27.7%	14.3%	25.2%
20-24	3,059	6,997	40.8%	32.4%	19.0%
25-29	1,308	3,827	17.5%	17.7%	10.1%
30-34	497	2,084	6.6%	9.7%	8.2%
35-39	247	1,425	3.3%	6.6%	6.7%
40-44	137	1,214	1.8%	5.6%	7.9%
45-49	66	993	0.9%	4.6%	7.5%
50-54	52	873	0.7%	4.0%	6.7%
55-59	28	606	0.4%	2.8%	4.7%
60+	18	479	0.2%	2.2%	3.8%
Total	**7,490**	**21,589**	**100.0%**	**100.0%**	**100.0%**

Source: ServiceIQ

With an average age of 24, trainees in the sector are on average, younger than in the ServiceIQ sector as a whole. The average age of all trainees in the ServiceIQ sector is 27. Approximately 31.4% of quick service restaurants trainees are 25 and over, compared with 53.3% in the ServiceIQ sector as a whole.

There are some differences between the age profile of the trainees and those employed in the sector. While 64.4% of ServiceIQ trainees are under 30, only 54.3% of employees in the sector are under 30.

Figure 19. Proportion of trainees by 5-year age group



Gender

Females account for a higher proportion of trainees in the sector than males. Approximately 53.9% of sector trainees are female, compared with 53.5% in the ServiceIQ sector as a whole.

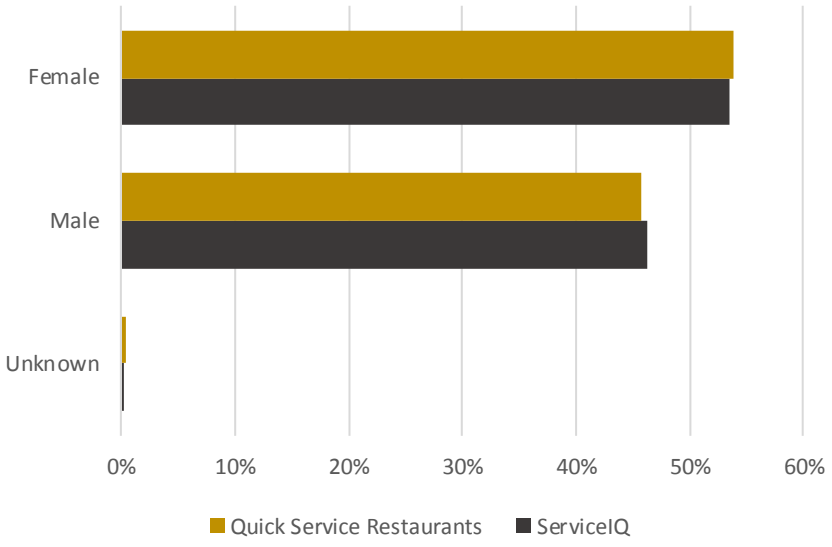
The gender profile of trainees in the sector is quite similar to the employment profile, with females accounting for 53.9% of trainees and 55.5% of employees.

Table 19. Number of trainees by gender

Gender	Number of trainees		% of total		Employment
	Quick Service Restaurants	ServiceIQ	Quick Service Restaurants	ServiceIQ	Quick Service Restaurants
Female	4,035	11,560	53.9%	53.5%	55.5%
Male	3,428	9,984	45.8%	46.2%	44.5%
Unknown	27	45	0.4%	0.2%	
Total	**7,490**	**21,589**	**100%**	**100%**	**100%**

Source: ServiceIQ

Figure 20. Proportion of trainees by gender



Source: ServiceIQ

Ethnicity

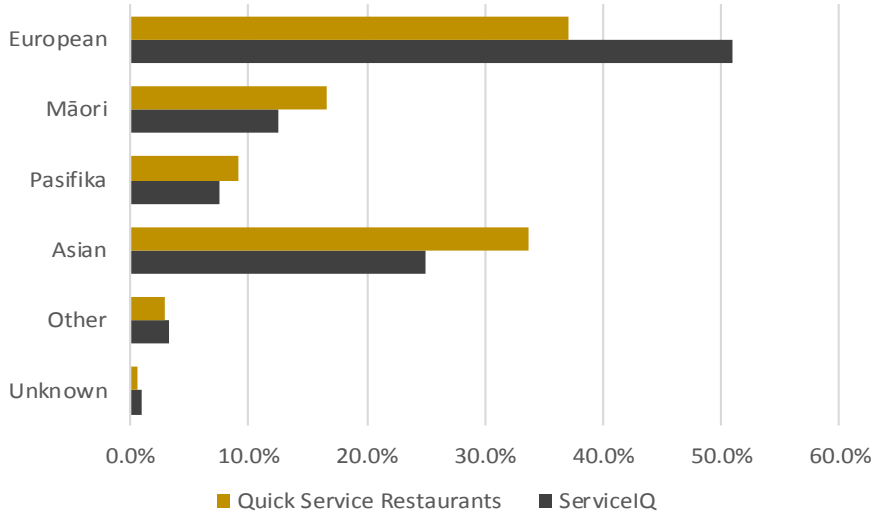
European is the largest ethnic group among trainees in the sector, accounting for 37.1% of trainees. This is a lower percentage than in ServiceIQ as a whole, in which they account for 50.9% of trainees. Within the sector the Asian group accounts for 33.8% of trainees and Māori, 16.7%.

Table 20. Number of trainees by ethnicity

Ethnicity	Number of trainees		% of total	
	Quick Service Restaurants	ServiceIQ	Quick Service Restaurants	ServiceIQ
European	2,778	10,991	37.1%	50.9%
Māori	1,250	2,716	16.7%	12.6%
Pasifika	683	1,629	9.1%	7.5%
Asian	2,529	5,381	33.8%	24.9%
Other	211	687	2.8%	3.2%
Unknown	39	185	0.5%	0.9%
Total	**7,490**	**21,589**	**100.0%**	**100.0%**

Source: ServiceIQ

Figure 21. Proportion of trainees by ethnicity



Source: ServiceIQ

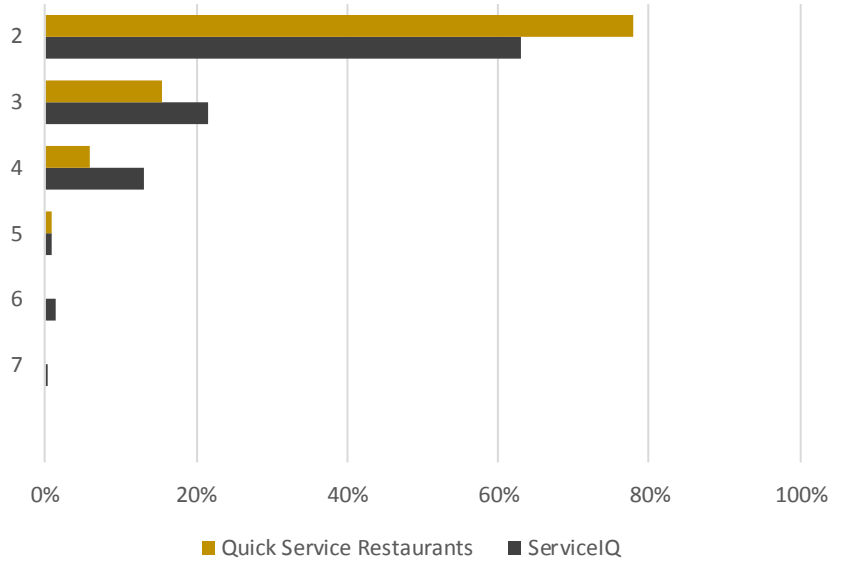
Level of study

The majority (78%) of trainees in sector are studying towards Level 2 qualifications. By contrast, 63.1% of trainees across the whole of ServiceIQ are studying for Level 2 qualifications. Only 6.7% of trainees in the sector are studying at Level 4 and above. One of Government's Better Public Service targets is to get 55% of 25-34-year-olds with Level 4 qualifications and above by 2017.

Table 21. Number of trainees by level of study

Level	Number of trainees		% of total	
	Quick Service Restaurants	ServiceIQ	Quick Service Restaurants	ServiceIQ
2	5,841	13,615	78.0%	63.1%
3	1,152	4,669	15.4%	21.6%
4	442	2,796	5.9%	13.0%
5	55	194	0.7%	0.9%
6	0	285	0.0%	1.3%
7	0	30	0.0%	0.1%
Total	**7,490**	**21,589**	**100.0%**	**100.0%**

Figure 22. Proportion of trainees by level of study



Source: ServiceIQ

Region

The majority of training occurs in the major population centres. A high proportion of sector trainees are located in Auckland (40.2%) which compares with 40.5% for all ServiceIQ trainees. The next-highest concentrations are in Canterbury (9.7%) and Bay of Plenty (9.2%) respectively.

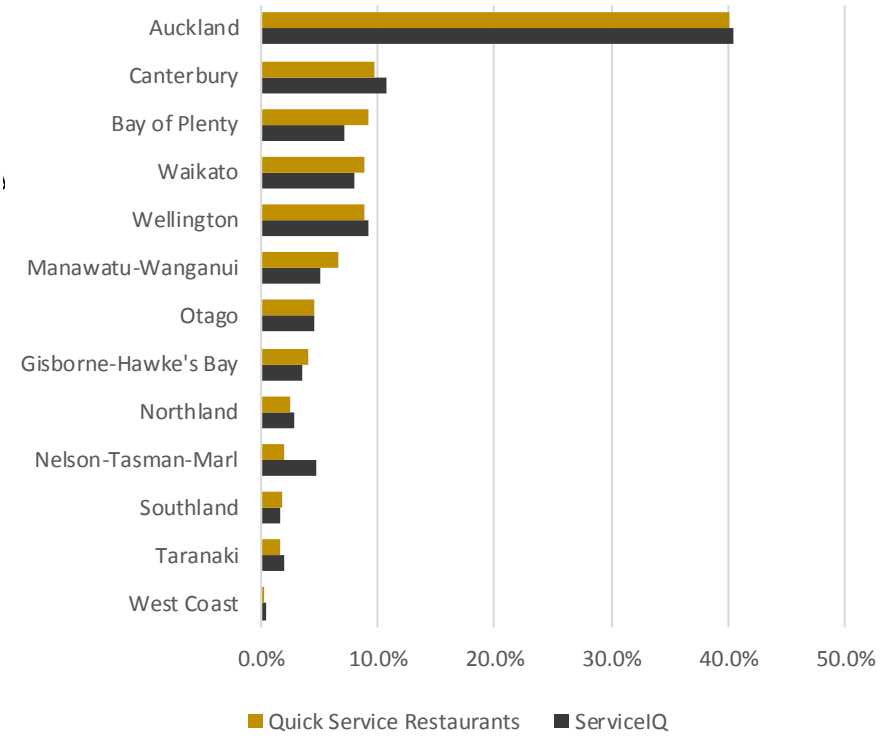
The distribution of trainees across the regions is quite similar to the distribution of employees. There are slight differences in Wellington (8.8% and 12.2%) and Bay of Plenty (9.2% and 7.0%).

Table 22. Number of trainees by region

Region	Number of trainees		% of total		Employment
	Quick Service Restaurants	ServiceIQ	Quick Service Restaurants	ServiceIQ	Quick Service Restaurants
Northland	185	628	2.5%	2.9%	2.7%
Auckland	3,010	8,748	40.2%	40.5%	36.3%
Waikato	668	1,719	8.9%	8.0%	8.9%
Bay of Plenty	688	1,548	9.2%	7.2%	7.0%
Gisborne-Hawke's Bay	300	743	4.0%	3.4%	4.4%
Taranaki	120	415	1.6%	1.9%	2.1%
Manawatu-Wanganui	494	1,077	6.6%	5.0%	5.6%
Wellington	660	1,990	8.8%	9.2%	12.2%
West Coast	16	104	0.2%	0.5%	0.6%
Canterbury	724	2,306	9.7%	10.7%	11.0%
Otago	344	963	4.6%	4.5%	4.5%
Southland	133	341	1.8%	1.6%	1.8%
Nelson-Tasman-Marl	148	1,007	2.0%	4.7%	2.9%
Total	**7,490**	**21,589**	**100%**	**100%**	**100%**

Source: ServiceIQ

Figure 23. Proportion of trainees by region



Source: ServiceIQ

Domain

Domain is the lowest order of classification within the NZ Qualifications Framework and represents a cohesive cluster of similar unit standards.

The highest proportion of the sector's trainees is studying for qualifications in the hospitality domain (71%). The next highest concentration is in the food and beverage service (29%).

Table 23. Number of trainees by domain

Domain	Number of trainees	% of total
Hospitality	5,300	70.8%
Food and Beverage Service	2,190	29.2%
Total	**7,490**	**100.0%**

Source: ServiceIQ

Provider-based training

This section shows enrolments and completions in provider-based qualifications of relevance to the sector. It includes all fields of studies of relevance to the sector. This means that some fields may be of relevance to other ServiceIQ sectors and are included in the statistics provided for those sectors.

Fields of study included in the above statistics are:

- Hospitality
- Food and Beverage Service
- Cookery
- Food and Hospitality (N.E.C., mixed or N.F.D.)

There were no enrolments and completions in provider-based qualifications specifically related to the sector in 2013.

Table 24. Enrolments and completions in provider-based training, 2012

Qualification	Enrolments	Completions
Certificates 1-3	7,030	2,410
Certificates 4	4,060	1,330
Diplomas	2,170	420
Bachelors degrees and higher	760	10

Source: Ministry of Education

7. APPENDIX A. METHODOLOGY

Measuring employment in the quick service restaurants sector

Infometrics uses a time series of industry-occupation employment matrices for New Zealand to define and measure total employment in the ServiceIQ sectors. Table 25 shows a hypothetical industry-occupation employment matrix. A total of 216 people are employed in this hypothetical economy. The matrix divides those people across four industries and five occupations. For example, 59 people are employed in Industry 1 and 6 of those 59 people are employed in occupation A.

Table 25. Hypothetical industry-occupation employment matrix

	Industry 1	Industry 2	Industry 3	Industry 4	Total
Occupation A	6	12	16	10	44
Occupation B	13	14	6	3	36
Occupation C	19	5	17	2	43
Occupation D	5	2	12	10	29
Occupation E	16	17	19	12	64
Total	59	50	70	37	216

In the above example we have defined a hypothetical ITO sector (the shaded cells) as consisting of Industry 2 and Occupations C and D. Total employment in the sector is calculated as 50+43+29=122. Total employment in each of the ServiceIQ sectors is calculated using actual industry-occupation matrices for New Zealand.

Infometrics has compiled a time series (2000-2013) of industry-occupation matrices for the New Zealand economy using 490 industries (level 5 industries of the ANZSIC06 industrial classification) and 1000 occupations (level 5 of the ANZSCO occupational classification) which were used for the estimation of employment in the ServiceIQ sectors.

The following data sources were used to construct the matrices:

- Infometrics Industry Occupation Model. This model provides a quarterly time series of total employment in 500 industries by region and territorial authority. The model provides more comprehensive, up-to-date and statistically robust estimates of employment than other data sources such as Business Demography. The model draws heavily on LEED quarterly data series which is the most robust source of industry employment data. The quarterly LEED series only measures employees. To account for the self-employed it is adjusted upwards using industry specific self-employment rates from the annual LEED series.
- Population census 1996, 2001, 2006, 2013. These censuses provide a time series of changes in the occupational composition of employment in each industry over time as well as a benchmark of total employment in each occupation in the census years.
- Various industry studies conducted by Infometrics. New information obtained in industry studies regarding the occupational composition of

employment in industries and how that changed over time is incorporated into our industry-occupation matrices.

Measuring demographic characteristics of sectors

Employment in the quick service restaurants sector is defined in terms of both industry and occupations using an industry-occupation employment matrix. After defining the sector on the matrix we sum employment across all occupations in each industry to arrive at employment by 500 industries. We can measure the demographic characteristics of employees in these industries using data from the 2006 and 2013 population census and aggregate across industries to arrive at an estimate for the sector as a whole.

Methodology for estimating net demand replacement

The cohort-component method developed by Shah and Burke[3] has been used to estimate net replacement rates. The cohort-component method uses estimates of employment by occupation and age category at two different points in time, to establish the inflows and the outflows in each occupation in each age-cohort. Shah and Burke used annual data. However, due to the lack of annual data for New Zealand, data from the 2001 and 2006 census was used in this study, together with national level forecasts from the Department of Labour.

The net flow from an occupation was estimated as the sum of the change in the size of each age cohorts between 2001 and 2006. If the size of the cohort decreased then there has been an outflow, whereas if the cohort increased the net outflow is equal to zero. This is true if the number of people employed in an occupation is expanding. However, if employment is decreasing then the net outflow is equal to the sum of outflows less the size of the employment decline. Total net outflow from an occupation is estimated by summing the net outflow from each age cohort. The five-year net demand replacement rate is estimated by dividing the total net outflow by employment in the occupation in 2001. This rate is converted to an annual rate.

The above method provides historical estimates of net replacement demand rates for each occupation between 2001 and 2006. To estimate the total number of job openings in future we have drawn on trends in national level forecasts estimated by the Department of Labour.

[3] Shah C and Burke G. 2001. 'Occupational replacement demand in Australia'. *International Journal of Manpower*, Vol. 22, No. 7, pp. 648-663. Centre for the Economics of Education and Training, Monash University.

Infometrics Regional Industry Employment Model

This study draws heavily on the Infometrics Regional Industry Occupation Model (RIOM) which provides more robust and up-to-date information than Business Demography statistics, the source used by many economic analysts for estimates of industry and regional employment. The RIOM is built on quarterly and annual LEED data extracted by special request from Statistics New Zealand at the territorial authority level. Quarterly LEED provides the number of employees in each industry for each quarter. Annual LEED provides the number of self-employed in each industry which are quarterised and added to the number of employees to arrive at total employment. The occupational dimension is added to the model using industry-occupation employment share matrices developed from successive population censuses.

The model estimates employment in recent quarters for which LEED is not available by using time-series analysis. The model draws on the relationships between industry performance at the territorial authority level and national level and recent trends in industry performance.

The RIOM provides estimates of the number of people employed in 480 industries in each region and territorial authority for each quarter since March 1999.

Data from the RIOM has the following advantages over data from Business Demography.

- The RIOM includes self-employment whereas it is excluded from Business Demography. The exclusion of self-employment leads to a significant undercount of employment in certain industries such as agriculture and construction. Infometrics utilises annual LEED to provide estimates of self-employment by industry.
- The RIOM is benchmarked on industry employment totals from LEED, which is statistically more robust than Business Demography. LEED is designed to measure employment whereas Business Demography is designed to measure the number of establishments etc. and only measures employment as a spin-off.
- The RIOM measures employment in each quarter of the year whereas Business Demography provides only a single snapshot (February) each year. Providing only a single snapshot is inadequate for industries such as horticulture and hospitality which are highly seasonal.

Output and employment forecasts by industry

The Infometrics Industry Model produces forecasts of output and employment for 54 industries using a mix of principle component and regression techniques to link macroeconomic key indicators (e.g., inflation, interest rates, unemployment, the exchange rate, business profitability etc.) to prospects for each industry. A key aspect of this approach is that it produces an outlook for an industry that takes into account the recent performance of that industry and the impact of key influencers on business performance in that industry. It is also constrained to ensure that the sum of production in all industries equals our forecasts of overall economic activity. That is, an industry can only grow faster than overall economic growth if past industrial performance and business conditions indicate that it will increase its share of national output.

The main applications of principle component or factor analytic techniques are: (1) to reduce the number of variables and (2) to detect structure in the relationships between variables, that is to classify variables. Therefore, factor analysis is applied as a data reduction or structure detection method.

In the current context, principle component analysis is used to separate a panel of data into its principal cross-sectional components and their associated time domain components. For example, one might have a panel of quarterly industrial production data that has been converted into measures of each industry's share of GDP, i.e. the share for the *i*-th industry in quarter *t* can be presented as:

$$q_{i,t} = \frac{Q_{i,t}}{\sum Q_{i,t}}.$$

Thus, one can forecast industrial production ($Q_{i,t}$) by applying forecasts of industrial shares ($q_{i,t}$) to forecasts of total GDP ($\sum Q_{i,t}$). The question then becomes one of forecasting the $q_{i,t}$'s. Principle component approaches are about reducing the scope of the forecast problem from forecasting, say, 20 inter-dependent $q_{i,t}$'s to one of diagnosing the interrelationship between each of the $q_{i,t}$'s and forecasting three or four independent time components.

Without going into the detailed mathematics, the aim of the approach is to use Eigen Values and Eigen Vectors to decompose the matrix of$q_{i,t}$'s into i independent (orthogonal) cross-sectional (I x 1) factor vectors ($\emptyset_i(q)$) each with an associated (1 x T) time-varying parameter-vector $\{\beta_{t,j}\}$. If $f_t(q)$ is the original (I x T) matrix of data, one can reproduce the matrix by simple matrix multiplication:

$$f_t(q) = \mu(q) + \sum \beta_{t,i}\emptyset_i(q)$$

The critical issues here are that each of the factor vectors $\emptyset_i(q)$are orthogonal and that one can often explain most of the variation in the matrix with a small subset of the factor vectors, e.g. greater than 90% of the variation might be explained by 3-4 of the factor vectors. This means that once we have undertaken the principle component analysis we can obtain reasonable forecasts by concentrating on just the 3-4 key factors and conducting independent forecasts of their associated time-varying parameter-vectors$\{\beta_{t,j}\}$.

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