Labour Market Insight from the 2013 Census: Implications for Modelling Labour Market Outcomes in Occupational (Skills) Employment Forecasting

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Abstract

The Census is the only reliable source of insight into the mix of occupations and skills across industries in New Zealand and is critical to understanding their relative importance and changes. The 2013 Census provides a new snapshot and benchmark for basing future forecasts and changes from the 2006 Census. In this paper, insights gained from the 2013 Census and their implications for occupational employment or skills forecasting are discussed. Analysis also shows occupational groups which become more or less important and those which remained relatively unchanged. Analysis also covers levels of highest educational qualification across occupational groups.

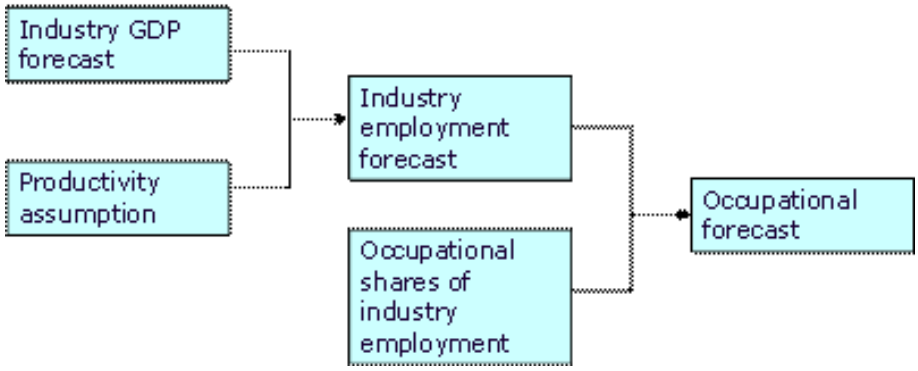
I. Background

Labour market insight about the mix of occupations in various industries and sectors of the economy is critical to understanding the importance of the different skills and the mix of skills in these industries. In New Zealand, the Census is the only reliable source of this and related information such as the share of those with different levels of highest qualification by occupation. The 2013 Census provides a snapshot and a new benchmark for basing future employment forecasts when this is studied along with the results from the 2006 and the 2001 Census.

In this paper, selected insights gained from the 2013 Census snapshot are provided and their implications and importance for occupational employment and skills forecasting are discussed. The changes between 2001, 2006 and 2013 suggested by Census are also noted. The approach to occupational employment forecasts used by national agencies in most countries and in New Zealand starts with forecasting industry employment based on the economic activity (GDP) forecasts at the industry level. This is carried out more frequently to reflect the changing domestic and external economic conditions and developments in the financial sector along with information on corresponding forecast industry level labour productivity. This is illustrated in the flow chart where the occupational shares of industry employment are sourced in New Zealand from the Census usually conducted every five years enabling occupational forecasts to be made.

[1] The views expressed are those of the authors and do not necessarily reflect the official views of the Ministry of Business, Innovation and Employment.

In the US, where the Census is conducted only every 10 years, this information is compiled from on-going surveys conducted by the Bureau of Labor Statistics (BLS) across groups of industries and in individual States. Occupational employment forecasts are carried out by many public (UK Commission for Employment and Skills, Human Resources and Skills Development Canada, Department of Education, Employment and Workplace Relations in Australia and BLS in the US) and some private organisations in Western and other countries at varying frequencies. These were reviewed recently and the broad skill mix in New Zealand in 2009 was compared with those in the US, Australia and the UK over similar periods along with the forecasts 10 years ahead (SriRamaratnam et. al., 2010).



Analysis from incorporating information extracted from the 2013 Census in the occupational forecasting framework and comparing with previous Censuses indicate which occupations have become more or less important and those which are relatively unchanged. This is compared to what was expected in 2013 based on the patterns of changes seen in previous Censuses for 2006, 2001 and 1996. Those patterns were studied before in 2001 using the previous NZSCO99 occupational groups and not the latest ANZSCO (Australia New Zealand Standard Classification of Occupations) occupational classifications which reflect more recent changes in the nature of occupations in the labour market and in the economy. Analysis also covers important information sourced from the 2013 (and previous) Census on the levels of (highest) educational qualification across occupational groups and their changes over time.

II. Broad Skill Mix of Occupational Groups – Changes over time

In all of the countries reviewed in 2010, those categorized as in highly skilled occupations such as managers and professionals made up a larger share than those in other broad skill categories and were also projected to rise at a higher rate than others. But in New Zealand the highly skilled category made up a larger share than in other countries and the results from the past three Censuses suggest that it has grown steadily from about 36% in 2001 to almost 42% in 2013. The forecast made in 2011 of the share of this skill category in 2013 based on the 1996, 2001 and 2006 Census was about 41.3% and is a slight under representation of the 2013 Census results available in early 2014.

Table 1: Broad Skill Mix	Census Shares			Forecast
Skill Categories	2001	2006	2013	2013
Highly Skilled	36.4%	38.7%	41.8%	41.3%
Skilled	13.2%	12.8%	11.9%	12.1%
Semi-Skilled	32.4%	31.2%	30.3%	29.9%
Elem-Skilled	18.0%	17.2%	16.0%	16.7%
Total	100%	100%	100%	100%

In terms of the other skill categories, those in skilled occupations such as associate professionals, technicians and trades workers were slightly over represented in the forecasts while the semi-skilled occupations covering sales, service and administrative workers were under represented and those in elementary skilled occupations such as machinery and plant operators along with workers or labourers were over represented.

Over the past three Censuses, there has been a steady decline in all the other three skill categories besides the highly skilled group covering occupations as described above. The rate of decline in all these three other skill categories was similar and shared to accommodate the rise in the share of those in highly skilled occupations.

III. Importance of Occupational Categories – Changes over time

Table 2: Relative Importance	Census Shares			Forecast
Highly Skilled	2001	2006	2013	2013
Managers	16.4%	17.7%	18.3%	18.4%
Professionals	14.1%	15.7%	17.3%	16.8%
Skilled				
Technicians	2.9%	3.0%	2.8%	3.1%
Building Trades Workers	2.4%	2.3%	2.6%	2.2%
Other Trades Workers	10.9%	10.4%	9.3%	10.0%
Semi-Skilled				
Support & Sales Staff	12.7%	13.2%	13.1%	13.4%
Office & Administrative Staff	13.6%	12.4%	11.6%	11.6%
Elementary Skilled				
Machine, Plant & Vehicle Operators	11.5%	10.5%	9.9%	10.2%
Workers, Labourers & Assistants	15.5%	14.8%	15.1%	14.4%
Total	100%	100%	100%	100%

The rise in the share of highly skilled occupations over time arose from the increase in both managers and the professionals but the rate of increase in those in professional occupations was somewhat higher than those in managerial occupations. The forecast share of professional occupations in 2013 was a slight under representation of the 2013 Census figure while that of the managerial occupations was quite similar.

Amongst those in skilled occupations, those categorized as technicians have declined somewhat since 2006 and hence were over represented in the projections for 2013 along with other trades workers. Building trades workers were under represented in

the 2013 forecasts due to a reversal of the declining trend seen in the Census up to 2006. Within the semi-skilled occupations support and sales staff were over represented and so were machine, plant and vehicle operators in the elementary group.

IV. Changes in the Shares of Individual Occupational Groups

In the previous two sections, the summarized shares for broad skill categories were discussed first followed by the less summarized shares for occupational categories. In this section the changes in the shares for all of the ANZSCO 3-digit occupational groups for which employment forecasts are produced by the Labour Market and Business Performance team are provided to assess which of these 97 Occupational Groups:

(a) became more important by increasing their shares (by 2 percent or more) over the 2001 to 2013 period. This represented 24 and are included in Table 3,

(b) became less important as their shares declined (by 2 percent or more) over the 2001 to 2013 period. This represented 15 and are included in Table 4, and

(c) those Occupational Groups which changed their shares by between +2 percent and -2 percent over the 2001 to 2013 period. These represented the majority or 58 out of the 97 ANZSCO 3-digit Occupational groups and are included in Table 5.

	Table 3: Increases in Shares of ANZSCO 3-Digit Occupational Groups	**Annual Changes**	
	Groups increasing in shares by 2% or more over 2001-13	**2001-13**	**2006-13**
1	512 Office and Practice Managers	5.4%	8.5%
2	511 Contract, Program and Project Administrators	4.7%	3.4%
3	212 Media Professionals	4.4%	7.2%
4	442 Prison and Security Officers	4.3%	4.7%
5	131 Advertising, Public Relations and Sales Managers	4.3%	2.7%
6	251 Health Diagnostic and Promotion Professionals	4.2%	2.8%
7	261 Business and Systems Analysts, and Programmers	4.0%	5.8%
8	134 Education, Health and Welfare Services Managers	3.9%	0.8%
9	271 Legal Professionals	3.8%	4.5%
10	263 ICT Network and Support Professionals	3.7%	3.1%
11	139 Miscellaneous Specialist Managers	3.6%	3.0%
12	135 ICT Managers	3.5%	4.2%
13	232 Architects, Designers, Planners and Surveyors	3.3%	2.2%
14	132 Business Administration Managers	3.3%	1.7%
15	225 Sales, Marketing and Public Relations Professionals	2.9%	2.7%
16	612 Real Estate Sales Agents	2.9%	3.6%
17	149 Miscellaneous Hospitality, Retail and Service Managers	2.7%	0.5%
18	441 Defence Force Members, Fire Fighters and Police	2.6%	3.8%
19	411 Health and Welfare Support Workers	2.5%	2.9%
20	223 Human Resource and Training Professionals	2.2%	0.3%
21	233 Engineering Professionals	2.1%	2.3%
22	333 Glaziers, Plasterers and Tilers	2.1%	2.7%
23	351 Food Trades Workers	2.1%	3.2%
24	452 Sports and Fitness Workers	2.0%	0.7%

The 3-digit ANZSCO occupational groups with share increases of over 2 percent in annual averages were concentrated in the highly skilled (15 out of the 24 covering both managers and professionals) occupations and the remaining across both skilled

(2 of them) and semi-skilled (7 covering a broad range) occupations. None of the elementary skilled occupations saw increases of over 2% over this period (Table 3).

Largest declines in occupational shares of over 2 percent were seen mainly in the skilled (certain types of trades workers in horticulture, wood and printing as well as painters and shearers) occupations and semi-skilled (certain types of clerical workers and keyboard operators) occupations. The only highly skilled occupational group to experience a sizeable decline in its share was farmers and farm managers (Table 4).

	Table 4: Decreases in Shares of ANZSCO 3-Digit Occupational Groups	**Annual Changes**	
	Groups decreasing in shares by 2% or more over 2001-13	**2001-13**	**2006-13**
1	313 ICT and Telecommunications Technicians	-2.2%	-1.9%
2	362 Horticultural Trades Workers	-2.4%	-3.0%
3	639 Miscellaneous Sales Support Workers	-2.5%	-1.7%
4	561 Clerical and Office Support Workers	-2.7%	-2.1%
5	121 Farmers and Farm Managers	-2.8%	-3.4%
6	394 Wood Trades Workers	-2.9%	-1.8%
7	552 Financial and Insurance Clerks	-2.9%	-2.5%
8	324 Panelbeaters, and Vehicle Body Builders, Trimmers and Painters	-3.0%	-4.0%
9	541 Call or Contact Centre Information Clerks	-3.0%	-1.1%
10	361 Animal Attendants and Trainers, and Shearers	-3.3%	-4.0%
11	531 General Clerks	-4.0%	-5.3%
12	712 Stationary Plant Operators	-4.5%	-1.8%
13	521 Personal Assistants and Secretaries	-4.9%	-4.0%
14	392 Printing Trades Workers	-5.8%	-9.9%
15	532 Keyboard Operators	-7.3%	-5.1%

The occupational groups that more or less maintained their shares by changing on average by less than 2 percent (both increases and decreases) over the 2001 to 2013 period represented almost 60 percent of the 97 occupational groups (Table 5). There was an almost even split of occupational groups which increased their share by less than 2 percent (28) and those which decreased their share by less than 2 percent (30).

Amongst those occupational groups which maintained their share with increases of less than 2 percent, a majority of them were in the highly skilled (14 out of 28 in the 100 and 200 levels) and elementary skilled (7 out of 28 in the 700 and 800 levels) category. Within the occupational groups which maintained their share with decreases of less than 2 percent, the distribution of them was more widespread. But the semi-skilled occupational group accounted for a third (10 out of 30 in the 400, 500 and 600 levels) along with the skilled (8 of them in the 300 level) and elementary skilled (8 of them in the 700 and 800 levels) category not too far behind in its share of the decline.

The four highly skilled occupations that saw some decline in their share over the 2001 to 2013 period were retail managers (-0.7 percent), tertiary education teachers (-0.5 percent), financial brokers, dealers and investment advisors (-1.0 percent) and air and marine transport professionals (-1.9 percent). It is also important to note that the rates of decrease in their share was more pronounced in the more recent 2006 to 2013 period (Table 5). The changes over the more recent 7 years between the latest two Census in 2006 and 2013 require some additional and separate discussion. This is taken up next by looking at annual average changes provided for this recent period also in Tables 3, 4 and 5.

	Table 5: Maintained Shares of ANZSCO 3-Digit Occupational Groups	Annual Changes	
	Groups Changing Shares by between + or - 2% over 2001-13	2001-13	2006-13
1	234 Natural and Physical Science Professionals	1.9%	2.2%
2	252 Health Therapy Professionals	1.8%	1.6%
3	322 Fabrication Engineering Trades Workers	1.8%	1.7%
4	312 Building and Engineering Technicians	1.8%	-0.3%
5	221 Accountants, Auditors and Company Secretaries	1.7%	2.2%
6	224 Information and Organisation Professionals	1.7%	2.3%
7	253 Medical Practitioners	1.6%	2.2%
8	731 Automobile, Bus and Rail Drivers	1.5%	1.9%
9	334 Plumbers	1.4%	3.2%
10	611 Insurance Agents and Sales Representatives	1.4%	-0.9%
11	272 Social and Welfare Professionals	1.1%	1.4%
12	331 Bricklayers, Carpenters and Joiners	1.1%	0.9%
13	262 Database and Systems Administrators, and ICT Security Specialists	1.1%	1.1%
14	241 School Teachers	0.9%	-1.6%
15	111 Chief Executives, General Managers and Legislators	0.8%	0.9%
16	211 Arts Professionals	0.8%	-0.3%
17	899 Miscellaneous Labourers	0.7%	-0.8%
18	399 Miscellaneous Technicians and Trades Workers	0.7%	0.5%
19	249 Miscellaneous Education Professionals	0.6%	-3.3%
20	599 Miscellaneous Clerical and Administrative Workers	0.6%	0.7%
21	891 Freight Handlers and Shelf Fillers	0.6%	1.2%
22	141 Accommodation and Hospitality Managers	0.4%	1.1%
23	254 Midwifery and Nursing Professionals	0.4%	0.5%
24	821 Construction and Mining Labourers	0.4%	0.3%
25	133 Construction, Distribution and Production Managers	0.3%	0.2%
26	851 Food Preparation Assistants	0.2%	0.7%
27	732 Delivery Drivers	0.1%	2.3%
28	721 Mobile Plant Operators	0.0%	0.5%
29	841 Farm, Forestry and Garden Workers	-0.1%	1.2%
30	341 Electricians	-0.2%	1.3%
31	431 Hospitality Workers	-0.2%	0.1%
32	311 Agricultural, Medical and Science Technicians	-0.2%	-0.2%
33	423 Personal Carers and Assistants	-0.3%	-0.1%
34	332 Floor Finishers and Painting Trades Workers	-0.3%	3.5%
35	741 Storepersons	-0.3%	0.7%
36	591 Logistics Clerks	-0.5%	-0.2%
37	242 Tertiary Education Teachers	-0.5%	-3.0%
38	551 Accounting Clerks and Bookkeepers	-0.6%	-0.9%
39	422 Education Aides	-0.6%	-2.8%
40	391 Hairdressers	-0.7%	-0.5%
41	142 Retail Managers	-0.7%	-1.1%
42	631 Checkout Operators and Office Cashiers	-0.7%	-2.1%
43	711 Machine Operators	-0.8%	-1.6%
44	421 Child Carers	-0.9%	-2.1%
45	839 Miscellaneous Factory Process Workers	-1.0%	4.9%
46	831 Food Process Workers	-1.0%	0.8%
47	222 Financial Brokers and Dealers, and Investment Advisers	-1.0%	-4.0%
48	321 Automotive Electricians and Mechanics	-1.1%	-1.5%
49	733 Truck Drivers	-1.2%	-1.4%
50	451 Personal Service and Travel Workers	-1.2%	-2.1%
51	342 Electronics and Telecommunications Trades Workers	-1.2%	0.6%
52	621 Sales Assistants and Salespersons	-1.3%	-0.7%
53	832 Packers and Product Assemblers	-1.4%	-0.4%
54	542 Receptionists	-1.5%	-2.1%
55	323 Mechanical Engineering Trades Workers	-1.7%	-1.2%
56	811 Cleaners and Laundry Workers	-1.9%	-1.4%
57	393 Textile, Clothing and Footwear Trades Workers	-1.9%	-1.7%
58	231 Air and Marine Transport Professionals	-1.9%	-2.7%

Changes over the more recent 2006 to 2013 period indicate that the occupational groups which experienced an **increase of 2 percent or more** over the entire 2001 and 2013 period (Table 3) did not experience a decline over the 2006 to 2013 period. Some of them saw much sharper increases over the recent period and these included:

(a) media professionals, business and systems analysts and programmers, legal professionals, ICT managers amongst the *highly skilled*,
(b) glaziers, plasterers and tillers and food trades workers amongst the *skilled*,
(c) office and practice managers, real estate agents and defence force members, fire fighters and police amongst the *semi-skilled* and
(d) none amongst the *elementary skilled*.

Amongst the occupational groups which saw a **decrease of 2 percent or more** over the 2001 to 2013 period (Table 4):

(a) some occupational groups saw a much sharper decline over the recent period covering broad range of skill groups such as horticultural trades workers; farmers and farm managers; panel beaters and vehicle body builders trimmers and painters; animal attendants and trainers and shearers; general clerks; and printing trades workers, latter with the most decline,
(b) others which experienced less pronounced decline over the recent period covered a broad range of skills such as keyboard operators; personal assistants and secretaries; stationary plant operators; call or contact centre information clerks; financial and insurance clerks; wood trades workers; clerical and office support workers; miscellaneous sales support workers; and ICT and telecommunications technicians.

Within the occupational groups which maintained their share over the entire 2001 to 2013 period with **increases or decreases of less than 2 percent** (Table 5):

(a) those occupational groups which **increased** by less than 2 percent over the entire period but saw a decline in the more recent period included building and engineering technicians (1.8 percent to -0.3 percent); insurance agents and sales representatives (1.4 percent to -0.9 percent); school teachers (0.9 percent to -1.6 percent); and miscellaneous education professionals (0.6 percent to -3.3 percent),
(b) those which **increased** by less than 2 percent over the entire period and saw an increase over 2 percent in the more recent period included the delivery drivers (from 0.1 percent to 2.3 percent); plumbers (from 1.4 percent to 3.2 percent); medical practitioners (from 1.6 percent to 2.2 percent); information and organisation professionals (from 1.7 percent to 2.3 percent); accountants, auditors and company secretaries (from 1.7 percent to 2.2 percent); and natural and physical science professionals (from 1. 9 percent to 2.2 percent),
(c) those occupational groups which **decreased** by less than 2 percent over the entire period but saw an increase in the more recent period included farm, forestry and garden workers; electricians; floor finishers and painting trades workers; miscellaneous factory process workers; and electronics and telecommunications trades workers, and
(d) those which **decreased** by less than 2 percent over the entire period but saw a decrease of over 2 percent over the more recent period included tertiary education teachers (from -0.5 percent to -3.0 percent); education aides (from -0.6 percent to -2.8 percent); checkout operators and office cashiers (from -0.7 percent to -2.1

percent); and financial brokers and dealers and investment advisers (from -1.0 percent to -4.0 percent).

V. Highest Qualification Levels of Employed – Changes over time

Another dimension of occupational employment forecasting is the need to understand the level and proportions of highest qualification associated with different occupational groups used in the forecasting approach. The Census is also the most reliable source of this qualification share information along with the occupational share information. Looking at the proportion of those in the labour market with different highest qualifications, those who are classified as with no (high school) qualification has steadily declined from over 20 percent in 2001 to about 14 percent in 2013 while those with degree or higher qualification increased from about 16% in 2001 to more than 25% by 2013 (Table 6).

Table 6: Highest Qual Mix	Census Shares			Forecast
Qual Categories	2001	2006	2013	2013
No (School) Quals	19.5%	18.7%	14.2%	15.2%
School (incl. Tertiary L 1-3) Quals	43.2%	39.6%	38.8%	32.2%
Vocational (L 4-6) Quals	20.9%	22.4%	21.9%	25.8%
Degree (L 7 and above) Quals	16.4%	19.4%	25.1%	26.8%
Total	100%	100%	100%	100%

Those with high school qualification, a pre-requisite for tertiary education declined from 43 percent in 2001 to about 40% in 2006 and to 39 percent by 2013 while those with vocational and trades qualifications which declined from about 25 percent to about 22 percent between 2001 and 2006 remained at just below 22 percent in 2013 and is now below the share of those with a degree or higher qualification.

In the next two sections of this paper, the highest qualification shares of those in different occupational groups which are summarized into broad skill categories are discussed first followed by broad skill categories share of those with different highest qualifications. The patterns of change over time evident from the past three Censuses are also noted and provide some broad measures of the degree of matching of qualifications with skills which has occurred over time. There is still some further scope for greater matching in different occupational (skill) groups.

VI. Highest Qualifications Share of Broad Skill Categories

When considering the highest qualification shares of those in occupational groups of broad skill categories first (Table 7), the share of those in highly skilled occupations with a degree or higher qualification share which was about 30 percent in 2001 rose to about 45% by 2013 while those with no (high school) qualification declined from about 11 percent in 2001 to about 6 percent in 2013.

At the other end of the skill spectrum, those who were employed in elementary skilled occupations and had no (high school) qualification appear to have declined from almost 42 percent in 2001 to about 35 percent in 2013. In between these two skill

levels, those who were employed in skilled occupations, which included the trade workers along with technicians, the share of those with vocational (levels 3-6) qualification has increased from 36 percent in 2001 to about 43 percent in 2013 after being at about 40 percent in 2006. The share of those in semi-skilled occupations with school qualification increased from 51 percent in 2001 to about 53 percent in 2013.

Table 7: Highest Qual Share of Broad Skill Categories

	2001				
Skill Categories - Shares of Highest Quals	**No Quals**	**School**	**Vocational**	**Degree**	**Total 2001**
Highly Skilled	11.4%	30.7%	28.5%	29.5%	**36.4%**
Skilled	21.6%	36.8%	36.0%	5.6%	**13.2%**
Semi-Skilled	18.5%	51.3%	21.1%	9.0%	**32.4%**
Elem-Skilled	41.7%	40.8%	14.6%	2.9%	**18.0%**

	2006				
Skill Categories - Shares of Highest Quals	**No Quals**	**School**	**Vocational**	**Degree**	**Total 2006**
Highly Skilled	8.7%	25.1%	28.4%	37.8%	**38.7%**
Skilled	18.7%	28.5%	47.1%	5.7%	**12.8%**
Semi-Skilled	16.8%	47.9%	23.8%	11.5%	**31.2%**
Elem-Skilled	41.4%	37.2%	17.5%	3.9%	**17.2%**

	2013				
Skill Categories - Shares of Highest Quals	**No Quals**	**School**	**Vocational**	**Degree**	**Total 2013**
Highly Skilled	6.3%	26.9%	21.9%	44.9%	**41.8%**
Skilled	14.2%	35.5%	42.6%	7.6%	**11.9%**
Semi-Skilled	13.0%	53.1%	18.2%	15.6%	**30.3%**
Elem-Skilled	34.9%	45.3%	14.6%	5.3%	**16.0%**

VII. Broad Skill Categories Share of Highest Qualification Groups

When considering the broad skill category share of those in different highest qualification groups next (Table 8), those with no (high school) qualification employed in highly skilled occupations appear to have declined from about 20 percent in 2001 to about 19 percent in 2013 while their share of employment in elementary skilled occupations rose from about 37 percent in 2001 to above 40 percent in 2013.

Those with degree or higher qualification employed in highly skilled occupational groups increased from already high 72 percent in 2001 to more than 74 percent in 2013 and their share decreased steadily across all other broad skill groups between 2001 and 2013. The share of those with vocational education (levels 3-6) and employed in skilled occupations (including trades) increased from about 19 percent in 2001 to under 23 percent in 2006 and to almost 25 percent by 2013. Their share in highly skilled occupations is somewhat higher at about 42-43 percent second only to those with degree or higher qualification in such highly skilled occupations.

It was important to look at information contained in tables 7 and 8 in order to assess the combinations of (broad) skills required by occupations with qualifications requirements of occupations in both directions to understand how the stock of people with different highest qualifications are found in different occupations at Census

taken over time when hiring decisions from an employer's perspective and job seeking and skill acquisition decisions from an employee's point of view determine the net flows in the inter-Census periods.

Table 8: Broad Skill Categories Share of Highest Qual Groups	2001				
Skill Categories - Shares of Highest Quals	Highly Skilled	Skilled	Semi-Skilled	Elem-Skilled	Total 2001
No Quals	20.2%	13.9%	29.3%	36.6%	**20.5%**
School	27.9%	12.1%	41.6%	18.4%	**40.0%**
Vocational	42.2%	19.3%	27.8%	10.7%	**24.6%**
Degree	72.0%	5.0%	19.6%	3.5%	**14.9%**

	2006				
Skill Categories - Shares of Highest Quals	Highly Skilled	Skilled	Semi-Skilled	Elem-Skilled	Total 2006
No Quals	18.6%	13.2%	28.9%	39.3%	**18.2%**
School	27.7%	11.6%	42.6%	18.2%	**34.7%**
Vocational	43.1%	22.7%	24.4%	9.8%	**27.5%**
Degree	74.5%	3.7%	18.3%	3.4%	**19.6%**

	2013				
Skill Categories - Shares of Highest Quals	Highly Skilled	Skilled	Semi-Skilled	Elem-Skilled	Total 2013
No Quals	18.9%	12.2%	28.5%	40.4%	**13.9%**
School	28.9%	10.8%	41.5%	18.7%	**38.8%**
Vocational	41.4%	22.9%	25.0%	10.6%	**22.1%**
Degree	74.3%	3.6%	18.7%	3.3%	**25.3%**

VIII. Regional Differences in the Skill Mix for Major Regions

The discussion so far has focused on the skill and qualification dimensions of those employed in different occupational groups and their combinations and mix at the national level. In this section, the regional differences, if any, in the skill mix of those employed in different major regions are explored by looking at the Auckland, Wellington and Canterbury regions using the results from Census of 2006 and 2013.

Differences in the occupational or overall skill mix of major regional labour markets are determined primarily by the composition of the industries in these regions. The occupational mix within industries could be influenced by the technology or capital intensity of production processes adopted by the firms and industries in different regions based on their size and scale. The differences in the level of overall employment in these regions and in which industries or sectors they are concentrated in will dictate the skill mix in these regions in comparison to the overall share across New Zealand when including all the regions.

According to the 2013 Census (Table 9) the share of those in highly skilled occupations in Auckland (44.5 percent) and in Wellington (47.8 percent) was higher than the New Zealand average (41.8 percent) but this share was somewhat lower in Canterbury (38 percent). This is a reflection of the dominance of the Government sector in Wellington and the Business Services sector in particular in Auckland.

In terms of those employed in skilled occupations, Canterbury had a larger share (13.4 percent) than the New Zealand average (11.9 percent) whereas both Auckland (10.7

percent) and Wellington (9.7 percent) had a lower share. Canterbury also had a larger share (18.5 percent) of those employed in elementary occupations compared to the New Zealand average (16.0 percent) while Auckland (12.3 percent) and Wellington (10.5 percent) had a much lower share. The onset of the Canterbury rebuild would have had a bearing on this 2013 Census result. With respect to those employed in semi-skilled occupations, which cover a number of service and sales workers, Auckland (32.5 percent) and Wellington (32.0 percent) had a larger share than the New Zealand average (30.3 percent) and Canterbury somewhat lower (30.2 percent).

Table 9: Main Regional Skill Mix Compared with New Zealand	2013 Census Skill Shares (Within region)			
Broad Skill Groups	**New Zealand**	**Auckland**	**Wellington**	**Canterbury**
Highly Skilled	41.8%	44.5%	47.8%	38.0%
Skilled	11.9%	10.7%	9.7%	13.4%
Semi-Skilled	30.3%	32.5%	32.0%	30.2%
Elem-Skilled	16.0%	12.3%	10.5%	18.5%
Total	**100%**	**100%**	**100%**	**100%**

When looking at the proportion of those employed in New Zealand in total by different broad skill groups across these three major regions (Table 10), the share of those in highly skilled occupations in Auckland (34.9 percent) and Wellington (13.6 percent) in 2013 was considerably higher than their overall employment share of 32.3 percent and 11.8 percent, respectively. Over the period from 2006 to 2013, however, the share of those employed in highly skilled occupations has increased in Auckland (from 31.8 percent in 2006 to 34.9 percent in 2013) but declined in Wellington (from 14.0 percent in 2006 to 13.6 percent in 2013), the latter likely the result of the rationalization of the public sector since 2009.

Table 10: Skill Proportions of Main Regions in 2013 and 2006	2013 Census (Proportions of NZ)			
Broad Skill Groups	**Auckland**	**Wellington**	**Canterbury**	**3 Regions**
Highly Skilled	34.9%	13.6%	12.9%	**61.4%**
Skilled	30.1%	9.9%	16.3%	**56.3%**
Semi-Skilled	34.0%	12.2%	13.7%	**59.9%**
Elem-Skilled	24.3%	7.6%	15.8%	**47.6%**
Total	**32.3%**	**11.8%**	**14.0%**	**58.1%**

	2006 Census (Proportions of NZ)			
Broad Skill Groups	**Auckland**	**Wellington**	**Canterbury**	**3 Regions**
Highly Skilled	31.8%	14.0%	12.4%	**58.2%**
Skilled	34.5%	13.7%	13.0%	**61.1%**
Semi-Skilled	28.8%	14.0%	10.1%	**52.9%**
Elem-Skilled	32.8%	13.6%	13.3%	**59.7%**
Total	**31.5%**	**13.8%**	**12.0%**	**57.3%**

In contrast, Canterbury (12.9 percent) had a smaller share of those in highly skilled occupations in comparison to its overall share (14 percent) in 2013 but had a

proportionately higher share of those employed in skilled occupations (16.3 percent) and this appear to have increased from this share in 2006 (13 percent). This is also true for the share of those in elementary skilled occupations in Canterbury (15.8 percent) in 2013 which increased considerably from the share in 2006 (13.3 percent), both likely to be related to employment increases associated with the Canterbury rebuild captured in the 2013 Census.

IX. Summary and Labour Market Implications

The occupational employment distribution across the industries and sectors in the economy and their highest qualification are critical labour market information. This insight is enabled by the conduct of the regular Censuses given the comprehensive nature of the information collected in a standardized manner allowing for the changes over time to be monitored effectively. Even if the Censuses are snapshots at points in time, they are still valuable for gaining insights about the types of changes that have taken place during the inter-Census periods. These signal likely changes in the future which should be captured in the occupational employment forecasting framework to produce reliable forecasts for skills analysis.

The postponement of the most recent Census from 2011 to 2013 due to the Canterbury earthquake of February 2011 required continued use of occupational and qualification shares projected from the previous three Censuses held in 2006, 2001 and 1996. This was necessary for the interim years 2011-13 when the Census was delayed and for forecast periods 2011 forward including 2013. In this paper, actual changes in occupational and qualification shares suggested by the past 3 Censuses are assessed. The differences between skills and qualification shares for 2013, assessed from previous Censuses and suggested by the 2013 Census are also compared to understand their forecast implications.

It has become apparent that according to the Census 2013, the share of those in highly skilled occupations has risen somewhat more rapidly (by about 0.5 percent share more) than projected for 2013 based on occupational share changes suggested by the previous 3 Censuses (in 2006, 2001 and 1996). This is mainly due to the faster rate of increase of those in professional occupational groups with implications for forecasts beyond. At the opposite end of the skills spectrum, those in elementary skilled occupations were assessed to be higher (by about 0.7 percent share) than suggested by the 2013 Census. Those in skilled occupations were forecast to be only slightly higher (by about 0.2 percent share) than indicated by the 2013 Census due to the decline in the share of those classified as technicians even though those in building related trades occupations were higher than forecast for 2013 (by about 0.4 percent share) compensating somewhat the decline in other trades workers.

With respect to the shares of employment of those in different highest qualifications, the shares of those with degree or higher qualifications have risen over time but was assessed to be higher than suggested by the 2013 Census (by about 1.7 percent share) while those in occupations with no (high school) qualifications suggested by the 2013 Census declined faster than estimated (by about 1.0 percent share). More importantly, the shares in occupational groups with vocational (including various trades) qualifications were assessed (25.8 percent) to be higher than suggested by the 2013 Census (21.9 percent) while those in occupations with (high) school qualification

(including tertiary levels 1-3) were estimated to be lower (32.2 percent) than suggested by the 2013 Census (38.8 percent). These results have somewhat reversed the trends seen in the previous three Censuses of 2006, 2001 and 1996 that lead to estimated higher vocational but lower school highest qualification shares in 2013 compared to the 2013 Census figures.

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