



Report to:

**TANZ**

# **EMPLOYMENT PROJECTIONS BY OCCUPATION AND INDUSTRY 2005-2011**

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**Employment Projections by  
Occupation and Industry  
2005-2011**

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# 1 Executive summary

This report outlines projected employment growth for New Zealand industry, by occupation type, for the period to 2011.

The context for the projections is an economy growing at an average 3.2% per annum in GDP terms over the 2005 to 2011 period. For such growth to occur employment is required to grow by 2.2% per annum in full-time equivalent (FTE) terms. This growth translates to an additional 250,000 FTEs required over the period to 2011, or an annual average of approximately 41,000.

An economic model<sup>1</sup> is used to provide a breakdown of this growth according to industry and occupation requirements. The use of the model ensures consistency in calculations as well as capturing the inter-relationships between the various industries<sup>2</sup> and the interactions between consumers, firms, importers, exporters, government and labour. The model provides information on projected employment across 49 industries and 40 occupation groups.

Amongst the largest occupation categories making up the 250,000 FTEs required are:

- managers where nearly 32,000 are needed;
- office clerical staff (25,000 more);
- sales staff (17,000 more);
- building trades workers (14,000 more);
- labourers and elementary service workers (13,000); and
- industrial process and plant operators (13,000).

In terms of industries, the largest addition is in the wholesale & retail trade sector, where more than 46,000 extra FTEs are required. This is consistent with the occupation numbers as a large majority of sales staff, as well as many managers, work in this sector. A further

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<sup>1</sup> The model used is labelled a computable general equilibrium (CGE) model and is a widely used tool to ensure demands, supplies and prices are consistent across all markets for products, labour and physical capital.

<sup>2</sup> For example, dairy processing output cannot grow unless dairy farming output grows.

22,000 are required by the legal, accounting & other business services sector, while 21,000 additional FTEs are needed by the building & construction industry.

The absolute magnitudes of these numbers reflect, to a degree, the absolute size of these groupings. For example, managers and office clerical staff are the two largest occupation categories. The position of these two categories at the top of the list requiring the largest number of additions is partly related to this factor.

In contrast, the numbers for growth in percentage terms reveals the importance of other categories. The fastest expanders, in percentage terms, are in the professional occupation categories – architects & engineers, health, teaching, business, legal and computer professionals – which require FTEs to grow in the range of 2.5 to 2.6% per annum. Much lower percentage growth is registered in the primary related agricultural, fishery and forestry occupation groups.

From the industry perspective, the machinery & equipment manufacturing sector records just over 3.0% per annum employment growth. Another fast grower is the air transport & services to transport sector growing at 3.2% per annum. The scientific research & technical services; legal, accounting & other business services and computer services sectors all record 2.7% per annum employment growth.

Finally, it should be noted that these additional employment requirements do not include the people needed to replace those moving to another industry, retiring or otherwise exiting their employment. The numbers for the extra FTEs required, as stated in this report, only include the additional employment necessary for the expected growth in output in the industry. In industries where staff turnover is high, the number of new recruits needed to be trained and attracted to the industry is likely to significantly exceed the numbers required for growth.

## 2 Introduction

This report updates an earlier BERL report on industry and occupation employment data. The information has been derived from Statistics New Zealand census of population and dwellings data. As far as practical, the data has been processed to ensure consistency with NZSCO and ANZSIC classifications and with economy-wide totals.

Employment figures for 2005 and projections for 2011 have been generated using BERL's computable general equilibrium model of the New Zealand economy and utilising externally sourced information on projections of export demand, productivity and a range of other economic indicators over the medium term. Details on the model and the projection process are available from BERL on request.

## 3 Macro picture context

### 3.1 Assumptions

Numerous assumptions are required to 'drive' the model projection, although the principal assumptions are views as to world growth (and how that translates into growth in demand for NZ's exports) and the rate of productivity improvements in NZ industry. In both cases, these factors are imposed at the detailed commodity and/or industry level, with the 'default assumption' being a continuation of recent trends and/or experience. In general, world demand growth is expected to continue at an average of 2.5%pa<sup>3</sup> while NZ productivity growth averages close to 1%pa.

### 3.2 The growth scenario

Table 3.1 summarises the projected outcome. In particular, GDP growth of just over 3%pa results in approximately 41,000 additional FTE positions each year. The consequent growth in exports reveals the continuing shift to services - which grow considerably faster than exports of commodities. Productivity growth also allows wages to increase above the rate of consumer price inflation.

**Table 3.1 Macroeconomic summary of the projection**

2005 \$M	2005	2011	2005 to 2011 %pa
<b>Gross Domestic Product</b>	<b>148,984</b>	<b>180,206</b>	<b>3.2</b>
Consumption expenditure	87,530	105,163	3.1
Investment expenditure	34,923	42,809	3.5
Government consumption	26,483	32,449	3.4
Exports: goods	32,040	36,981	2.4
Exports: services	11,101	14,320	4.3
Imports	44,732	53,497	3.0
<b>Employment (000s FTEs)</b>	<b>1,752</b>	<b>2,001</b>	<b>2.2</b>
<i>NB: annual change in FTEs (000s)</i>		41.6	
Average wage	38,614	44,775	2.5
Consumer prices (2005=100)	100.0	110.8	1.7

<sup>3</sup> Representing higher demand growth for manufactures and services with correspondingly lower demand growth for primary commodities.

## 4 Employment

In 2005 there were around 1.75m full time equivalents employed in New Zealand. This is expected to increase to 2.0m in 2011. These projections suggest that New Zealand will require an extra 250,000 FTEs by 2011.

### 4.1 Occupations

Employment by occupation can be broken down to 40 occupation categories. A summary table is included in Appendix B. The largest occupation group currently (2005) is the corporate managers group, with around 218,000 FTEs in 2005 or just over 12% of all FTEs. This is followed by office clerks (162,000) and then salespersons (118,000). The smallest occupation group is railway engine drivers, ships deck crews and related workers. This group accounts for around 2,000 FTEs, which is just over 1/10 of one percent of all FTEs.

Projecting forward, the greatest need will be in the corporate manager and office clerk occupations, where an extra 32,000 and 25,000 FTEs will be required over the next 5 years. Other occupations which require significant increases in FTEs include other teaching professionals; finance, sales and administrative associate professionals; salespersons; building trades workers; and industrial plant and machinery operators.

### 4.2 Industries

Employment by industry can be broken down into 49 industry categories as in Appendix B. The largest industry category is 'wholesale and retail trade', with 313,000 FTEs in 2005. Other large categories are 'legal, accounting and other business services' (213,000 FTEs) and 'construction' (137,000 FTEs).

Projecting forward, the greatest increase will be in wholesale and retail trade and legal, accounting and other business services where an extra 46,000 and 21,000 FTEs will be required. Other industries that require large increases in FTEs include construction; schooling and other education; hospitals, nursing homes, aged accommodation and other community care; and personal and other services.

### 4.3 Consolidated categories

Employment by industry and by occupation are available in detail (49 industry and 40 occupation levels), but for a more general overview we have aggregated the industry and occupation levels into eight groups. This also allows a graphical analysis to be undertaken.

The eight occupations and industries are listed in the following table. For a breakdown of the industries and occupations that make up each group see Appendix A.

Consolidated Occupations	Consolidated Industries
Professionals (PRF)	Primary (PRIM)
Skilled white collar (SKW)	Processing (PROC)
Semi-skilled and unskilled white collar (SUW)	Manufacturing (MNFG)
Rural workers (RUR)	Utilities and building (UTBL)
Skilled blue collar building (SBB)	Distribution (DIST)
Skilled blue collar metal and electrical (SBM)	Business services (BUSV)
Skilled blue collar other (SBO); and	Personal services (PESV)
Semi-skilled and unskilled blue collar (SUB).	Government, education, defence and health (GEDH)

Looking then at the consolidated industries we get a different picture of employment by occupation and industry.

**Table 4.1 Employment by consolidated industry**

	2005	2011	2005 to 2011 chge	%pa
PRIM	132,003	132,640	637	0.1
PROC	86,143	94,517	8,374	1.6
MNFG	159,924	187,598	27,674	2.7
UTBL	165,470	189,358	23,888	2.3
DIST	387,631	446,760	59,129	2.4
BUSV	353,216	408,946	55,730	2.5
PESV	128,338	146,345	18,007	2.2
GEDH	338,973	395,327	56,353	2.6
<b>Total</b>	<b>1,751,699</b>	<b>2,001,491</b>	<b>249,792</b>	<b>2.2</b>

The largest industry is 'distribution' (387,000), followed by 'business services' (353,000), and 'government, education, defence and health' with 338,000 employees. The smallest industry group is 'primary processing' with only around 86,000 FTEs.

**Table 4.2 Employment by consolidated occupation**

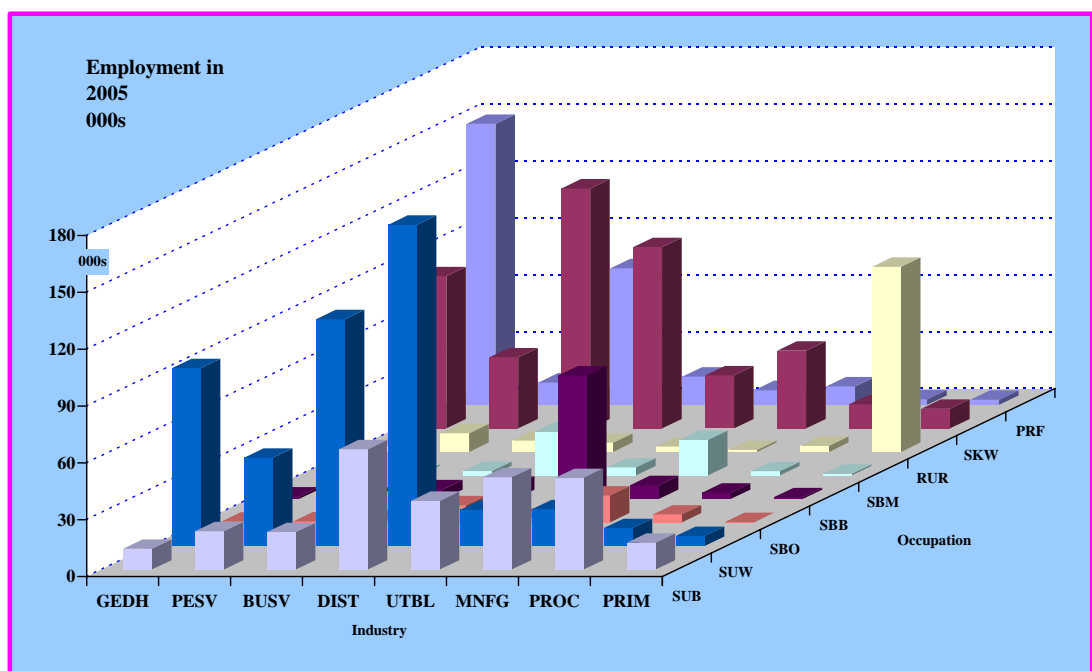
	2005	2011	2005 to 2011 chge	%pa
PRF	270,162	314,261	44,099	2.6
SKW	432,215	498,265	66,050	2.4
RUR	128,204	132,442	4,237	0.5
SBM	53,089	61,475	8,386	2.5
SBB	91,102	105,089	13,987	2.4
SBO	32,739	37,584	4,844	2.3
SUW	482,680	554,974	72,295	2.4
SUB	261,508	297,401	35,894	2.2
<b>Total</b>	<b>1,751,699</b>	<b>2,001,491</b>	<b>249,792</b>	<b>2.2</b>

Looking at the 2005 numbers by occupation category, and 'semi-skilled and unskilled white collar' (482,000) and 'skilled white collar' (432,000) are the main groups. The next level down is 'professionals' and 'semi-skilled and unskilled blue collar', each with just over 250,000 FTEs. 'Rural workers' still account for a large proportion, while skilled blue collar metal and electrical' is the smallest group with only 32,000 FTEs.

The tables above show the growth in employment in industry and occupation groups individually. The following graphs provide a visual representation of the employment numbers broken down by industry and occupation over the years 2005 and 2011. There is also a figure showing the change between 2005 and the forecast period.

Figure 4.1 shows the breakdown of employment by industry and occupation in 2005. Professionals in the 'government, education, defence and health' (GEDH) industry is the biggest group followed by 'skilled workers' in the 'business services' and 'distribution' industries. Looking at industries, most GEDH workers are 'professionals', with 'skilled white collar' and 'semi-skilled and unskilled white collar' the other main occupations. Unsurprisingly the majority of workers in the 'primary' industry are 'rural workers'.

**Figure 4.1 Employment in New Zealand in 2005**



The overall pattern in 2011 of employment is projected to be fairly similar to 2005 as shown in Figure 4.2. However, there are some notable areas of growth as shown in Figure 4.3.

Figure 4.2 Projected employment in New Zealand in 2011

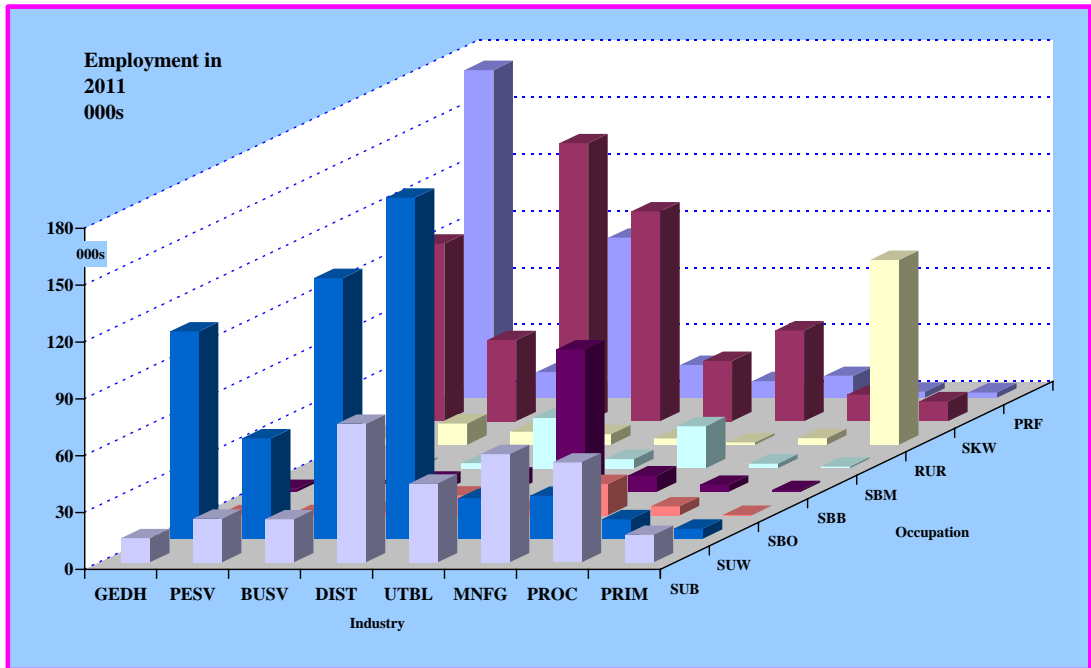
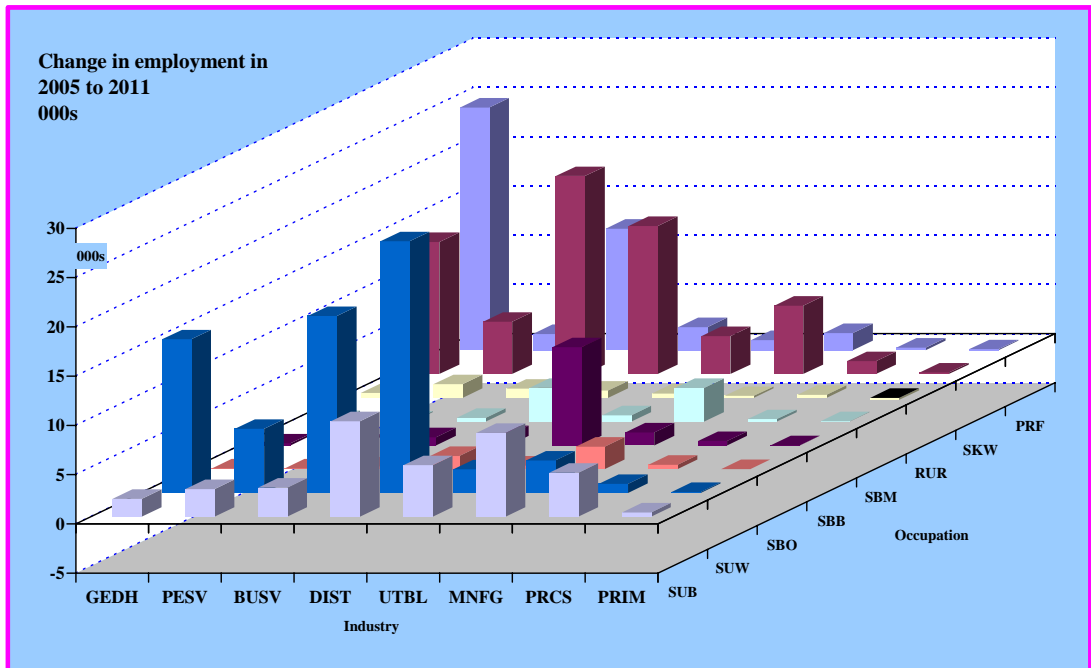


Figure 4.3 shows the projected change in employment between 2005 and 2011, and this figure highlights where the main changes are projected to occur.

Figure 4.3 Projected change in employment 2005 to 2011



The occupation increases are spread across the industries in the Figure 3.3. For example those for professional and managerial (PRF) total about 44,000, and in Figure 3.3 it shows that these are concentrated in government, education and health (GEDH) with 25-30,000 increase; and business services (BSV) with 10-15,000 increase. The increases in skilled white collar (SKW) are more-widely spread among industries as are semi-skilled and unskilled white collar (SUW). The three classifications of skilled blue collar occupations are more specific to the relevant industries.

The full breakdown of changes in employment by occupation by industry are available from the model output if required.

## 5 Appendices

### 5.1 Appendix A: codes and descriptions

Occupation code	Description	NZSCO	Consolidated occupations
LEGA	Legislators and administrators	11	SKW
CORP	Corporate managers	12	SKW
SCIP	Physicists, chemists, mathematicians and related professionals, life science professionals	211, 212, 221	PRF
COMP	Computing professionals	213	PRF
AREN	Architects, engineers and related professionals	214	PRF
HLTP	Health professionals, nursing & midwifery	222, 223	PRF
TETP	Tertiary teaching professionals	231	PRF
OTEP	Other teaching professionals	232-235	PRF
BUSP	Business professionals	241	PRF
LEGP	Legal professionals	242	PRF
OTHP	Other professionals	243-245	PRF
SCIT	Physical science and engineering technicians, life science technicians and related	311, 321	SKW
CMEC	Computer equipment controllers	312	SKW
OPEC	Optical and electronic equipment controllers	313	SKW
OCTS	Ship and aircraft controllers and technicians	314	SKW
HLAP	Health associate professionals	322, 323	SKW
FSAP	Finance, sales and administrative associate professionals	331, 332	SKW
GVAP	Government and social work associate professionals, careers and employment advisors	333, 334, 335	SKW
OTAP	Safety and health inspectors, environmental protection and other associate professionals	315, 337, 338	SKW
WAES	Writers, artists, entertainment and sports associate professionals	336	SKW
OFCK	Office clerks	41	SUW
CSCK	Customer services clerks	42	SUW
TRAV	Travel attendants and guides	511	SUW
REST	Housekeeping and restaurant services workers	512	SUW
POCW	Personal care and other personal service workers	513, 514	SUW
PRSW	Protective services workers	515	SUW
SALE	Salespersons, demonstrators and models	52	SUW
FARM	Farmers, growers and animal producers	611-612	RUR
FRST	Forestry and related workers	613	RUR
FISH	Fishery workers, hunters and trappers	614	RUR
BDTW	Building trades workers	71	SBB
MMTW	Metal and machinery trades workers	72	SBM
PRTW	Precision trades workers	73	SBO
OCTW	Other craft and related trades workers	74	SBO
IPMO	Industrial plant operators, stationary machine operators	81, 82	SUB
RAIL	Railway engine drivers, ships deck crews and related workers	831, 834	SUB
MOVD	Motor vehicle drivers	832	SUB
AGEO	Agricultural, earthmoving and other materials handling equipment operators	833	SUB
BLRW	Building and related workers	84	SUB
LBSW	Labourers and related elementary service workers	91	SUB

Industry code	Description	ANZSIC	Consolid industry
HFRG	Horticulture and fruit growing	A011	PRIM
MLVC	Mixed livestock and cropping	A0121, A0122, A01591	PRIM
SHBF	Sheep and beef cattle farming	A0123-A0125	PRIM
DAIF	Dairy cattle farming	A013	PRIM
OAGR	Other farming and services to agriculture, hunting & trapping	rest A01, A02	PRIM
LOGG	Forestry & logging	A03	PRIM
FISH	Commercial fishing	A04	PRIM
COAL	Coal mining	B11	PRIM
OILG	Oil & gas extraction and exploration	B12, B1511, B1512	PRIM
OMIN	Other mining & quarrying and services to mining	B13, B14, B1514, B1520	PRIM
MEAT	Meat processing	C2111	PROC
DAIR	Dairy product manufacturing	C212	PROC
OFOD	Other food processing & mfg	rest C21	PROC
TCFL	Textiles, clothing, footwear & leather mfg	C22	MNFG
WOOD	Log sawmilling, timber dressing & other wood product mfg	C231, C232	PROC
PAPR	Paper and paper product mfg	C233, C239	PROC
PPRM	Printing, publishing & recorded media	C24	MNFG
PETR	Petroleum	C251, C252	MNFG
CHEM	Chemical and chemical product mfg	C253, C254	MNFG
RBPL	Rubber and plastic product mfg	C255, C256	MNFG
NMMP	Non-metallic mineral product mfg	C26	MNFG
BASM	Basic metal manufacturing	C271-C273	MNFG
FABM	Structural, sheet and fabricated metal product mfg	C274-C276	MNFG
MACH	Machinery and equipment mfg	C28	MNFG
OMFG	Other manufacturing	C29	MNFG
EGEN	Electricity generation	D361pt	UTBL
EDIS	Electricity transmission & supply	D361pt	UTBL
GASS	Gas supply	D362	UTBL
WATS	Water supply	D3701	UTBL
BLDG	Construction	E	UTBL
TRDE	Wholesale & retail trade	F, G	DIST
ACCR	Accommodation, cafes & restaurants	H57	BUSV
ROAD	Road transport	I61, I661	DIST
WRAI	Water and rail transport	I62, I63, I662	DIST
AIRS	Air transport, services to transport, storage	I64, I65, I663, I664, I67	DIST
COMM	Communication services	J71	UTBL
FIIN	Finance and insurance	K	BUSV
OWND	Ownership of owner-occupied dwellings	L771190pt	BUSV
OPRS	Other property services	rest L77	BUSV
SCIT	Scientific research & technical services	L781, L782	BUSV
COMP	Computer services	L783	BUSV
LAOB	Legal, accounting & other business services	L784-L786 (xL7865-66)	BUSV
GOVD	Govt administration & defence	M, Q9631-Q9633	GEDH
SCHL	Pre-school, primary, secondary & other education	N84 (xN843) O871	GEDH
OEDU	Post-school education	N843	GEDH
HOSP	Hospitals, nursing homes, aged accommodation & other comm care	O861, O872	GEDH
OHLT	Medical, dental and other health services	rest O86	GEDH
CULT	Cultural and recreational services	P	PESV
PERS	Personal and other services, pest control and cleaning services, waste disposal & sewerage services	D3702, L7865-66, Q (excl Q9631-Q9633)	PESV

## 5.2 Appendix B: occupations

	FTEs (000s)		2005-2011	
	2005	2011	Chge	%pa
LEGA	3.80	4.39	0.59	2.42
CORP	218.64	250.99	32.34	2.33
SCIP	8.40	9.65	1.25	2.33
COMP	16.97	19.73	2.76	2.54
AREN	32.13	37.41	5.27	2.57
HLTP	50.05	58.19	8.14	2.54
TETP	16.44	19.14	2.70	2.56
OTEP	64.06	74.72	10.65	2.60
BUSP	50.61	58.84	8.23	2.54
LEGP	11.87	13.90	2.03	2.66
OTHP	19.62	22.70	3.08	2.46
SCIT	27.72	32.07	4.35	2.46
CMEC	10.66	12.37	1.71	2.51
OPEC	7.18	8.26	1.09	2.38
OCTS	4.32	5.08	0.77	2.76
HLAP	13.60	15.81	2.22	2.55
FSAP	85.63	99.10	13.47	2.46
GVAP	24.77	28.81	4.04	2.55
OTAP	6.16	7.09	0.93	2.38
WAES	29.73	34.29	4.55	2.40
OFCK	162.01	187.01	25.00	2.42
CCK	61.87	71.46	9.59	2.43
TRAV	5.18	6.12	0.94	2.80
REST	57.02	64.28	7.27	2.02
POCW	52.53	60.71	8.18	2.44
PRSW	25.78	29.77	3.99	2.43
SALE	118.30	135.63	17.33	2.30
FARM	117.23	120.34	3.11	0.44
FRST	6.67	7.36	0.69	1.65
FISH	4.30	4.75	0.44	1.64
BDTW	91.10	105.09	13.99	2.41
MMTW	53.09	61.47	8.39	2.47
PRTW	12.08	13.91	1.83	2.37
OCTW	20.65	23.67	3.02	2.30
IPMO	95.75	108.59	12.85	2.12
RAIL	2.21	2.53	0.32	2.27
MOVD	39.71	45.47	5.76	2.28
AGEO	15.80	17.67	1.87	1.88
BLRW	9.46	10.93	1.46	2.43
LBSW	98.58	112.22	13.63	2.18
<b>TOTAL</b>	<b>1,751.70</b>	<b>2,001.49</b>	<b>249.79</b>	<b>2.25</b>

### 5.3 Appendix C: Industries

	FTEs (000s)		2005-2011	
	2005	2011	Chge	%pa
HFRG	24.34	24.59	0.25	0.17
MLVC	6.49	6.54	0.05	0.14
SHBF	28.51	27.79	-0.72	-0.43
DAIF	30.88	30.10	-0.78	-0.42
OAGR	26.30	26.69	0.39	0.25
LOGG	8.39	9.15	0.76	1.46
FISH	3.28	3.59	0.30	1.49
COAL	0.90	0.96	0.06	1.09
OILG	0.57	0.63	0.06	1.65
OMIN	2.35	2.60	0.25	1.71
MEAT	21.54	22.95	1.41	1.06
DAIR	7.49	7.86	0.37	0.81
OFOD	31.60	34.45	2.85	1.45
TCFL	18.31	21.94	3.63	3.06
WOOD	19.88	22.88	3.01	2.38
PAPR	5.64	6.38	0.74	2.08
PPRM	24.96	28.58	3.61	2.28
PETR	0.60	0.70	0.10	2.63
CHEM	8.70	9.84	1.14	2.07
RBPL	10.51	12.01	1.50	2.25
NMMP	7.19	8.47	1.28	2.76
BASM	5.17	6.11	0.93	2.80
FABM	24.13	28.19	4.05	2.62
MACH	44.30	53.00	8.70	3.03
OMFG	16.05	18.77	2.72	2.65
EGEN	0.95	1.08	0.13	2.15
EDIS	4.20	4.77	0.57	2.16
GASS	0.42	0.48	0.06	2.42
WATS	0.95	1.03	0.08	1.44
BLDG	137.54	158.56	21.02	2.40
TRDE	313.29	359.45	46.15	2.32
ACCR	76.77	85.89	9.12	1.89
ROAD	33.79	38.76	4.97	2.31
WRAI	7.59	8.69	1.10	2.28
AIRS	32.96	39.86	6.90	3.22
COMM	21.42	23.43	2.02	1.51
FIIN	57.38	66.70	9.32	2.54
OWND	0.00	0.00	0.00	0.00
OPRS	44.56	51.32	6.76	2.38
SCIT	29.65	34.88	5.22	2.74
COMP	21.71	25.48	3.77	2.70
LAOB	123.14	144.68	21.54	2.72
GOVD	69.06	80.69	11.63	2.63
SCHL	104.92	122.41	17.48	2.60
OEDU	29.80	34.79	4.99	2.61
HOSP	79.43	92.48	13.05	2.57
OHLT	55.75	64.96	9.21	2.58
CULT	43.28	49.43	6.15	2.24
PERS	85.06	96.92	11.85	2.20
<b>TOTAL</b>	<b>1,751.70</b>	<b>2,001.49</b>	<b>249.79</b>	<b>2.25</b>

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